Port of Vancouver
Groundwater Pump and Treat Interim Action

Vancouver, Washington

SEPA CHECKLIST

December 20, 2007

WAC 197-11-960 Environmental checklist.

ENVIRONMENTAL CHECKLIST

Purpose of checklist:

The State Environmental Policy Act (SEPA), chapter 43.21C RCW, requires all governmental agencies to consider the environmental impacts of a proposal before making decisions. An environmental impact statement (EIS) must be prepared for all proposals with probable significant adverse impacts on the quality of the environment. The purpose of this checklist is to provide information to help you and the agency identify impacts from your proposal (and to reduce or avoid impacts from the proposal, if it can be done) and to help the agency decide whether an EIS is required.

Instructions for applicants:

This environmental checklist asks you to describe some basic information about your proposal. Governmental agencies use this checklist to determine whether the environmental impacts of your proposal are significant, requiring preparation of an EIS. Answer the questions briefly, with the most precise information known, or give the best description you can.

You must answer each question accurately and carefully, to the best of your knowledge. In most cases, you should be able to answer the questions from your own observations or project plans without the need to hire experts. If you really do not know the answer, or if a question does not apply to your proposal, write "do not know" or "does not apply." Complete answers to the questions now may avoid unnecessary delays later.

Some questions ask about governmental regulations, such as zoning, shoreline, and landmark designations. Answer these questions if you can. If you have problems, the governmental agencies can assist you.

The checklist questions apply to all parts of your proposal, even if you plan to do them over a period of time or on different parcels of land. Attach any additional information that will help describe your proposal or its environmental effects. The agency to which you submit this checklist may ask you to explain your answers or provide additional information reasonably related to determining if there may be significant adverse impact.

Use of checklist for nonproject proposals:

Complete this checklist for nonproject proposals, even though questions may be answered "does not apply." IN ADDITION, complete the SUPPLEMENTAL SHEET FOR NONPROJECT ACTIONS (part D).

For nonproject actions, the references in the checklist to the words "project," "applicant," and "property or site" should be read as "proposal," "proposer," and "affected geographic area," respectively.

A. BACKGROUND

1. **Name of proposed project, if applicable:** Groundwater Pump and Treat Interim Action

2. **Name of applicant:** Port of Vancouver

3. **Address and phone number of applicant and contact person:**

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4. **Date checklist prepared:** December 20, 2007

5. **Agency requesting checklist:** Washington Department of Ecology

6. **Proposed timing or schedule (including phasing, if applicable):**

Project construction is planned to initiate in August 2008 and to be completed in early 2009. The project location is included on Figure 1. The project is designed to be capable of expanding from one pumping well to two wells. The expansion will be dependent on the efficacy of the treatment process in later years. If necessary, the project will be expanded with the new well in the immediate area of the well shown on Figure 2.

There are four basic construction phases that will occur for the project at its onset, including:

- Drill well and lay all underground piping and utilities.
- Pour foundations for building, treatment plant containment, and equipment pads.
- Install equipment.
- Install electrical and controls.

7. **Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain.**

Depending on the efficacy of the groundwater pumping activities, an additional well may be installed immediately adjacent to the development site proposed and shown in Figure 2. If the second well is installed, the system would have a total pumping capacity of approximately 6,200 gallons per minute (gpm).

In addition to the proposed Groundwater Pump and Treat Interim Action, it is anticipated that the Port will continue to operate remedial systems associated with the Cadet Manufacturing site to reduce volatile organic compound (VOC) contamination in the project area. These remedial systems include an air sparging and soil vapor extraction (AS/SVE) system under Cadet's Manufacturing building, recirculating groundwater remediation wells (RGRWs) at the Cadet facility and in the North Fruit Valley Neighborhood (NFVN), and in-home soil vapor vacuum (SVV) systems in six houses in the NFVN to mitigate VOCs detected in indoor air.

Data collected as part of the proposed Groundwater Pump and Treat Interim Action will be used by the Port to prepare a Feasibility Study which will evaluate additional technologies that potentially could be used to reduce VOC contamination in the project area.

8. **List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal.**

There has been much information collected and assessed on behalf of the proposed project. Since 1998, the Port of Vancouver has been conducting a remedial investigation and interim cleanup actions at the Swan Manufacturing Company (SMC) and Cadet Manufacturing sites to address tricholorethylene (TCE) and other related VOCs in soil and groundwater. An investigation of the Cadet Manufacturing site located approximately 1,000 feet northwest of the SMC site has occurred concurrently with the SMC investigation. The two sites had a common owner and this resulted in litigation between the Port and Cadet. In 2006, as part of a settlement agreement with Cadet Manufacturing, the Port purchased the Cadet site and assumed responsibility for cleanup at the Cadet site. The remedial investigations and interim actions conducted at the SMC and Cadet sites have included the collection of specific information used in the preliminary design of the proposed Groundwater Pump and Treat Interim Action. Examples of this information includes: topographic survey data, hydraulic data for the storm water system, analytical data for groundwater, soil, indoor and outdoor air, groundwater modeling results, and current and future land use data. The most recent documents related to this project that comprehensively address most of the information collected for this project include:

- Parametrix, S.S. Papadopulos & Associates, and Pacific Groundwater Group. 2007. Draft Vancouver Lake Lowlands Groundwater Model Summary Report**.** Prepared for Port of Vancouver and Clark Public Utilities. Under review by Ecology.

- Parametrix, 2004 Groundwater Modeling Summary Report. Prepared for the Port of Vancouver

- Parametrix, 2007 Final Remedial Investigation Report: Former Building 2220 Site (aka Swan Manufacturing Company Site)**.** Prepared for Port of Vancouver. Under review by Ecology.

- Parametrix. 2006**.** 2006 Semiannual Groundwater Monitoring Report: SMC and Cadet Sites**.** Prepared for Port of Vancouver.

- AMEC. 2005. Remedial Investigation Report Update, Cadet Manufacturing Company. Prepared for Cadet Manufacturing Company.

- AMEC. 2003. Draft Remedial Investigation Report, Cadet Manufacturing Company. Prepared for Cadet Manufacturing Company. Under review by Ecology.

Reports that are currently being prepared by the Department of Ecology (Ecology) or the Port of Vancouver include the Work Plan, Agreed Order, and Preliminary and Final Design Reports.

9. **Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain.**

There are no pending applications for the subject property at this time.

Clark Public Utilities (CPU) is in the process of developing a wellfield in the area to provide a public water source. Extraction of groundwater at the CPU wellfield has the potential to impact the current groundwater flow direction (and VOC migration) in the project area. The interim action is designed to be implemented prior to the CPU development and if necessary, will operate such that it will counteract potential impacts of the CPU wellfield on the dissolved-phase groundwater plume.

10. **List any government approvals or permits that will be needed for your proposal, if known.**

The project is proposed in accordance with a pending Agreed Order between the Ecology and the Port of Vancouver (Port) that requires the Port to implement an interim action to pump and treat contaminated groundwater originating from the Cadet and SMC sites. The Model Toxics Control Act (MTCA) (RCW 70.105D.090) exempts remedial actions conducted under an agreed order from the procedural requirements of some Washington laws and any laws requiring or authorizing local government permits or approvals (e.g., Critical Area Permit, Shoreline Conditional Use Permit). Although some permits and approvals are not needed, MTCA requires Ecology to ensure compliance with the substantive provisions of any laws requiring or authorizing local government permits of approvals.

The following is a list of permits or approvals that will either be required or subject to review by the local jurisdiction per MTCA provisions. Permits/approvals that will be sought by the project applicant and substantive reviews required per the MTCA exemption are noted:

- Building Permit (City of Vancouver) – MTCA exemption
- NPDES Industrial Wastewater Discharge Permit (Ecology)(treated groundwater) – Application pending
- Notice of Construction (SWCAA) – Application pending
- Wastewater Discharge Permit (Title 14, Chapter 10, Section 120)(City of Vancouver)(process wastewater) – MTCA exemption
- Shoreline Conditional Use Permit (City of Vancouver) – MTCA exemption
- Critical Areas Permit (City of Vancouver) – MTCA exemption

No project construction would occur within 200 feet landward of the ordinary high water mark (OHWM); however, all new project facilities except the proposed treatment plant would be located within areas identified by Clark County as "proposed floodway fringe." The City of Vancouver considers all floodplains adjacent to the shoreline as subject to Shoreline Management Act jurisdiction. The only facility included as a component of the project and located within 200 feet of the OHWM is an existing underground storm drain that outfalls to the Columbia River. Less than one acre of land would be disturbed by project construction; therefore, a construction stormwater permit is not required.

11. **Give brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page. (Lead agencies may modify this form to include additional specific information on project description.)**

The Port of Vancouver Groundwater Pump and Treat Interim Action has been proposed in accordance with a pending Agreed Order between the Port and the Department of Ecology. The interim action is designed to capture commingled dissolved VOC plumes sourced from the SMC site and the Cadet site, and to reduce the concentrations of VOCs in groundwater in the project area. The project involves pumping groundwater from the former SMC source area, conveying the contaminated water to a treatment plant that will use an air stripping process, conveying treated water to an existing outfall on the Columbia River, and conveying backwash water to the City of Vancouver's publicly owned treatment works (POTW). The method selected for groundwater treatment, air stripping, is on EPA's list of presumptive remedies for ex-situ treatment of VOC's. An alternatives analysis consistent with MTCA requirements was completed to determine the selected remedial alternative. The findings of the alternatives analysis are documented in a Work Plan (November 2007) for the Groundwater Pump and Treat Interim Action. The Work Plan is currently being reviewed by Ecology.

As shown in Figure 2, new facilities will be required to implement the Interim Action. New facilities are listed and described below:

- Groundwater Extraction Well(s)
- Pump House(s)
- Pipeline from pump house to treatment plant
- Treatment plant
- Pipeline from treatment plant to existing storm drain

Groundwater Extraction Well & Pumping System

A hydrogeologic model was applied for the remedial action to determine the pumping rates necessary to contain the contaminant plume and offset effects of the Clark Public Utilities (CPU) wellfield and to avoid any direct potential contamination of the Port's nearby water supply well. As shown in Table 1 of Attachment A, the maximum required pumping rate in year 1 is expected to be approximately 2,500 gpm. The average flow rate during the first year of operation is expected be approximately 1,400 gpm. Initially, TCE concentrations are anticipated to be approximately 200 µg/L at the well screen of the pumping well. The concentration of TCE in the extracted water is expected to decline steadily as extraction and cleanup progresses through subsequent years of operation. Table 1 in Attachment A shows the estimated concentrations over a 25-year period.

The extraction system will include one groundwater extraction well located on the former SMC site. The well will be designed to produce a maximum groundwater extraction rate of up to approximately 3,900 gallons per minute (gpm). Typical average flow rates from the well are anticipated to be 1,400 to 2,500 gpm. Flow rates from the well will be variable and will be controlled manually with adjustment valves located at the treatment plant. A flow meter will be included on the discharge line from the well to monitor and record flow continuously. Ultimately, the extraction system may be expanded to contain two wells with a total pumping capacity of 6,200 gpm.

Well diameter and depth will be approximately 24 inches and 130 feet, respectively. The well pump will be vertical turbine with a power output of approximately 250 hp. The well motor will be variable speed to accommodate the anticipated variations in pumping rate needed. The well head and associated piping will be located in a well house with a footprint of approximately 500 square feet.

Pipeline from pump house to treatment plant

All piping and electrical conduits will run underground from the well house to the treatment plant. An underground forcemain about 18-inches in diameter and about 1,000 feet long would run along the eastern side of Saint Francis Lane from the well house to the treatment plant. The pipeline would be installed using an open trench method.

Treatment plant

The layout of the air strippers are shown in Figure 3 and the details of each stripper are illustrated in Figure 4. The overall treatment process is depicted in Figure 5. Pumped groundwater will be sprayed from nozzles at the top of the towers to distribute contaminated water over the packing in the stripper column. A fan will be used to force air countercurrent to the water flow, stripping the VOCs from the groundwater. The treated groundwater will then be discharged to the Columbia River.

The air stripping towers have been preliminarily designed using a computer model to simulate process performance. The computer model is based on a two-phase resistance theory (gas and liquid phase) and uses empirically derived Onda Correlations (Onda, et al. 1968). This model has been verified in the field for groundwater TCE removal (Ball and Edwards 1992). Air stripping is a well-understood technology in which volatile organics are partitioned from groundwater by greatly increasing the surface area of the contaminated water exposed to air.

The treatment system design is based on removing TCE from a maximum concentration of 200 µg/L at the well screen down to the analytical reporting limit of less than 0.5 µg/L. There are multiple VOCs in groundwater in the project area. TCE is the VOC with the highest concentration in the project area and is the most difficult compound to

strip relative to other risk driver chemicals. Therefore, removing TCE to required discharge standards will result in attainment of discharge standards for other risk driver chemicals. Actual flows and concentrations from the groundwater extraction system are expected to vary over time and are shown for the first 25 years of operation in Table 1 of Attachment A. Beyond year 25, average flows are expected to remain steady at approximately 3,900 gpm, and TCE concentrations are expected to continue to decline asymptotically. The system will be capable of treating VOC concentrations higher than the projected influent concentrations (flow rate can be adjusted to remove higher VOC concentrations from pumped groundwater).

The treatment plant will be immediately adjacent to an existing Port tenant building. The overall tower height will be about 65 feet and the diameter will be about 10 feet; the strippers will be installed on concrete pads. Packed tower air strippers (as shown in Figure 4) would include a spray nozzle at the top of the tower to distribute contaminated water over the packing in the column, a fan to force air countercurrent to the water flow, and a sump at the bottom of the tower to collect decontaminated water.

Liquid chlorine (sodium hypochlorite) will be injected at the treatment plant at a controlled rate to prevent biological growth (e.g., algae and bacteria) from accumulating in the air stripping tower and to aid in the removal of iron and manganese from groundwater within the magnesium dioxide filter (Figure 5). Chlorine injection will be controlled automatically (paced with water flow rate) to maintain a chlorine residual of approximately 1 ppm.

A manganese dioxide filter will be used to remove naturally occurring iron and manganese from extracted groundwater. The water will flow through the filter bed at a flux rate of approximately 12 gpm per square foot. The manganese dioxide filter media requires daily backwashing to maintain the effectiveness of the media for oxidizing and removing iron and manganese. The backwash water concentrated with iron and manganese will be discharged to the sanitary sewer. The filters will be backwashed once every 24 hours and approximately 5,000 gallons per day (gpd) will be discharged with high total dissolved solids, iron, and manganese.

Off-gases from the air strippers may or may not require treatment. Treatment requirements, if any, will be determined by SWCAA in the air permit and will be based on meeting discharge limits for VOCs as well as results of a Best Available Control Technology (BACT) analysis. The BACT analysis, prepared by the Port for SWCAA review, presents an evaluation of available control technologies and considers feasibility, effectiveness, economics, and other factors.

Pipeline from treatment plant to existing storm drain

Treated discharge water from the air strippers will gravity flow into a wet-well located below ground at the treatment facility. The wet-well volume will be sized for sufficient capacity and retention time for dechlorination. Dechlorination will be provided by adding sodium metabisulfite to react with and remove all remaining residual chlorine in the water. The sodium metabisulfite will be in a liquid form stored in an above ground tank.

Discharge pumps will be located in the wet-well and will convey treated water through a discharge line. A new conveyance line, approximately 800-foot long will be routed from the treatment system as shown on Figure 2 and will connect to an existing 36-inch storm drain. The actual diameter of the conveyance line will depend on whether the new pipe is a forcemain (18-inches) or gravity pipe (36-inches). The flow will then travel by gravity through the existing 36-inch storm drain which runs beneath the rail spur and the Port Terminal 2 area. The 36-inch storm drain discharges though an existing bank outfall beneath the Terminal 2 dock.

The portion of the existing 36-inch storm drain which runs beneath the rail spur is owned by the City of Vancouver. The portion of the existing 36-inch storm drain which runs beneath Port Terminal 2 area is owned by the Port. This pipeline was originally designed with a significant amount of surplus flow capacity. A hydraulic analysis has been performed on this pipeline as well as the drainage areas and storm volumes that currently discharge through it. The analyses indicate that the 36-inch pipeline has more than sufficient capacity to convey the treated discharge water plus any stormwater. The analysis indicates that only on rare occasions (e.g., 25-year, 1 hour storm flow) would the

pipeline reach full flow capacity. Under these rare conditions, treated water discharge would be momentarily delayed until after peak storm flows have subsided. Based on hydraulic modeling, this situation would only occur approximately once for a few hours over the course of a 25-year period. Level sensors will be included in the discharge line/36-inch line connection to automatically turn flows off from the extraction/treatment system during these rare peak flow events.

12. **Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist.**

The project is located at the Port of Vancouver in the City of Vancouver near the northern shoreline of the Columbia River and west of the Interstate 5 Bridge crossing. The site is adjacent to and south of Fourth Plain Boulevard and west of Mill Plain Boulevard (Figures 1 and 2). The site is located in the southwest quarter of Section 21, Township 2 North, Range 1 East.

B. ENVIRONMENTAL ELEMENTS

1. **Earth**

a. **General description of the site ((circle (highlight) one)): Flat, rolling, hilly, steep slopes, mountainous, other . . . . . .**

Immediately adjacent to the project site there are stormwater ponds having steep side slopes; however, the project site itself is relatively flat. The site is near the shoreline of the Columbia River within developed industrial lands.

b. **What is the steepest slope on the site (approximate percent slope)?**

The existing stormwater pond located near the proposed pipeline extension (location where piping for the treated water discharge will connect into existing stormwater piping) and on the north side of the railroad tracks has the steepest slope on the site with slopes at approximately 3:1.

c. **What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any prime farmland.**

Soils on the site are primarily sand and silty sand. There are no soils classified as agricultural or prime farmland on the site or adjacent to the site.

d. **Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe.**

The entire project site and surrounding area is mapped as moderate to high liquefaction hazard. The soils at the site are suitable to the proposed project.

e. **Describe the purpose, type, and approximate quantities of any filling or grading proposed. Indicate source of fill.**

Limited grading would be required to provide a level surface for the treatment plant and the well and pump house. Grading would be limited to providing for installation of a new underground pipeline and connecting the well site to the treatment site and the treatment site to the existing stormwater pipeline.

f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe.

Erosion would not occur as a result of project operation. However, very minor erosion could occur during construction if best management practices were not appropriately applied. Minor earth disturbance work would be associated with construction of the well, pump house, and treatment plant. The pipeline and treatment plant would involve construction mostly on or under paved facilities.

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)?

The sites for the project facilities are comprised almost entirely of paved surfaces or buildings. The proposed well and pump house at the SMC site, which is a vacant gravel-covered lot, would be the only addition of impervious ground surface. These facilities would convert no more than about 500 square feet of pervious surface to impervious surface. The treatment facility and new conveyance lines would be located in areas already covered with impervious material.

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any:

Typical best management practices for sedimentation and erosion control would be implemented during construction. Such measures include, but are not limited to, the use of silt fences.

2. **Air**

a. **What types of emissions to the air would result from the proposal (i.e., dust, automobile, odors, industrial wood smoke) during construction and when the project is completed? If any, generally describe and give approximate quantities if known.**

Temporary, minor emissions from construction vehicles and dust from limited grading activities would be anticipated during construction. Long-term air emissions from air strippers used to treat contaminated groundwater would also be anticipated.

Air emissions will be regulated under state and local air quality regulations. Air quality regulations include Acceptable Source Impact Levels (ASILs) for toxic air pollutants such as TCE and tetrachloroethylene (PCE) (WAC 173-460-150 (2)), small quantity emission rates [SQER; WAC 173-460-080 (2)(e)], and MTCA compound specific levels calculated using equations 750-1 and 750-2 of WAC 173-340-750 and available through the Cleanup Levels and Risk Calculations (CLARC) database. The evaluation of air emissions is a tiered process. If the projected emission levels exceed SQERs, the emission needs to be modeled and compared to ASILs. As summarized in Table 2 of Attachment A, the projected emission rates for TCE and PCE are above the corresponding SQER; therefore, emissions from the proposed air strippers were modeled with EPA Screen 3, a very conservative dispersion model developed by U.S. EPA, to provide preliminary estimates of air pollutant concentrations. Modeled concentrations were based on the maximum mass emission levels of TCE expected to be emitted from the treatment system. The maximum anticipated ground level concentrations are predicted to occur approximately 40 feet from the towers. As shown in Table 2, the maximum TCE air emissions, including ground level concentrations are expected to be below the ASIL for TCE of 0.59 micrograms per cubic meter (µg/m3) as an annual average (WAC 173-460-110).

Compared to other risk driver chemicals, TCE has the most stringent ASIL and SQER standard. By meeting air quality standards for TCE, the standards for other risk driver chemicals will also be achieved.

b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe.

Great Western Malting (GWM) has a similar air stripping facility near the project site. The project would not create a cumulative air quality effect when considering GWM emissions, since groundwater presently treated at GWM currently has substantially lower TCE groundwater concentrations (< 20 µg/l) and is located approximately 3,000 feet from the proposed treatment plant. There are several air emission sources within one mile of the proposed treatment plant that have a permit from SWCAA. These facilities are identified in Table 3 of Attachment A. The majority of these emission sources are designated as small source or gas stations, and would therefore be unlikely to create an adverse cumulative effect.

c. Proposed measures to reduce or control emissions or other impacts to air, if any:

Standard best management practices (BMPs) would be applied during construction, including wetting down areas to prevent dust dispersion, routine inspections of construction equipment exhaust systems, and the use of silt screens. Air emissions from the strippers would be compliant with the ASIL and SQER standards. A Best Available Control Technology (BACT) analysis, as required by SWCAA as part of the Notice of Construction, will be used to determine if further emission treatment, such as treatment with granulated active carbon (GAC) is necessary.

3. **Water**

a. Surface:

1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into.

The nearest construction activity (treated water pipeline) would occur within about 1,371 feet from the Columbia River. The Columbia River flows directly to the Pacific Ocean, about 100 miles downstream from the project. Two artificial stormwater ponds are located immediately adjacent to the proposed treated water conveyance line. Two other stormwater ponds are located about 548 feet south and about 249 feet east of the proposed treated water conveyance line. Stormwater from these ponds is conveyed through an existing underground storm drain that discharges nearby to the Columbia River.

Vancouver Lake is located northeast of the project with the lowlands situated approximately one mile east.

2) Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans.

No project construction would occur within 200 feet of federal or state jurisdictional surface waters. However, as part of the project, treated water would be conveyed within an existing storm drain that discharges nearby to the Columbia River.

3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material.

No dredge or fill material would be discharged to surface waters or wetlands.

4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known.

The project would not require surface water withdrawals or diversions.

5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan.

While local mapping shows the proposed project facilities to lie outside of the floodplain; it does show the site to be located in a "proposed floodway fringe zone" (Figure 1). In addition, a recent topographic survey of the project site shows that the well, pump house, and the two, proposed water conveyance lines would be located on land slightly below the 28.5 foot 100-year flood elevation. This would be inconsequential for the underground conveyance lines; however, to avoid flooding, the foundation for the pump house would be constructed to be above the 100-year flood elevation. The site of the treatment facility is at elevation 31 feet and is therefore well above the 100-year flood elevation.

6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.

The project would discharge treated groundwater into the Columbia River through an existing stormwater outfall. The amount of water to be discharged is nearly equal to the amount of water proposed to be pumped from the wellfield. The difference in the quantity of water that would be pumped from the quantity discharged to the Columbia River is equal to about 3.47 gpm. This water loss would be from the backwashing of the iron/manganese filter. The backwash would be directed to the sanitary sewer. Therefore, the project would discharge an approximate average volume of 1,400 to 2,500 gpm. Ultimately, if a second well is added in later years, up to 6,200 gpm minus water lost in the treatment process would be discharged to the Columbia River. Because VOCs are the only chemicals of concern in the discharged groundwater, it is expected that their removal to below analytical reporting limits will result in discharge water quality that meets the requirements of the anticipated NPDES permit. The treatment process will have little effect on water temperature and given that the water will be discharged into the Columbia River, temperature alterations would be negligible.

An alternatives analysis prepared for the project and coordinated with local agencies and Port tenants considered water reclamation options as opposed to discharging all of the water to the Columbia River, but none of the options were found to be practical.

b. Ground:

1) Will ground water be withdrawn, or will water be discharged to ground water? Give general description, purpose, and approximate quantities if known.

Contaminated groundwater will be withdrawn via a groundwater extraction well located on the former SMC site (see Figure 2). The well will be designed to produce a maximum groundwater extraction rate of up to approximately 3,900 gallons per minute (gpm). Typical average flow rates from the well during interim action are anticipated to be 1,400 to 2,500 gpm. Ultimately, the final treatment system may contain two wells with a total pumping capacity of 6,200 gpm. Modeling studies have been performed applying varying pumping rates to develop a pumping rate that captures and contains the groundwater plume. The modeling indicates that proposed pumping rates from the new well would not directly affect the Port of Vancouver's drinking water supply well.

2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals. . . ; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.

Not applicable.

c. Water runoff (including stormwater):

1) Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe.

Project facilities will generate little runoff given their small footprint (about 500 square feet). In addition, many of the facilities will be buried under existing impervious surface. Runoff generated from project facilities will be collected and treated in the existing stormwater system within the site vicinity which includes stormwater ponds and conveyance outfall to the Columbia River (Figure 2).

2) Could waste materials enter ground or surface waters? If so, generally describe.

The only "waste" material that would enter ground or surface waters is that described above, namely treated stormwater runoff and treated groundwater processed through air strippers.

d. Proposed measures to reduce or control surface, ground, and runoff water impacts, if any:

No specific measures are proposed to further reduce or control runoff water impacts since as stated, the project would generate very little runoff and any runoff would be treated in the Port's existing stormwater system. No measures are proposed to reduce surface water impacts since the treated water discharged to the Columbia River will meet the requirements of the anticipated NPDES permit.

4. **Plants**

a. Check or circle types of vegetation found on the site:

_____ deciduous tree: alder, maple, aspen, other

_____ evergreen tree: fir, cedar, pine, other

_____ shrubs

__X__ grass

_____ pasture

_____ crop or grain

_____ wet soil plants: cattail, buttercup, bullrush, skunk cabbage, other

_____ water plants: water lily, eelgrass, milfoil, other

__X__ other types of vegetation (herbaceous weeds)

b. What kind and amount of vegetation will be removed or altered?

Herbaceous weeds would be removed to create the foundations for the well and pump house. Combined, the well and pump house would occupy an area of about 500 square feet.

c. List threatened or endangered species known to be on or near the site.

While no listed threatened or endangered plant species occur on or near the site, a State Sensitive plant, Western ladies' tresses (*Spiranthes porrifolia*), occurs several miles west of the project area on Port property (i.e., Parcel 3). This plant would not be affected by the proposed project.

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any:

No landscaping is proposed at the new facilities.

5. **Animals**

a. Circle (highlight) any birds and animals which have been observed on or near the site or are known to be on or near the site:

birds: hawk, heron, eagle, songbirds, other:
mammals: deer, bear, elk, beaver, other: Stellar sea lion
fish: bass, salmon, trout, herring, shellfish, other: Pacific lamprey, green sturgeon

b. List any threatened or endangered species known to be on or near the site.

No federal listed threatened or endangered terrestrial animal species occur within the project vicinity. Federally listed aquatic species within the nearby Columbia River include: Northern (Steller) sea lion (*Eumetopias jubatus*), Chinook salmon (*Oncorhynchus tshawytscha*) (Lower Columbia River ESU, Upper Columbia River spring run, and Snake River fall and spring/summer runs), steelhead trout (*Oncorhynchus mykiss*)(Lower Columbia River DPS, Middle Columbia River, and Snake River Basin), Snake River sockeye salmon (*Oncorhynchus nerka*), Lower Columbia River coho salmon (*Oncorhynchus kisutch*), Columbia River ESU chum salmon (*Oncorhynchus keta*), and Columbia River DPS bull trout (*Salvelinus confluentus*). These anadromous fish species use the Columbia River channel near the project site as a migration route for spawning and a throughway for juveniles returning to the Pacific Ocean.

Sandhill crane (*Grus Canadensis*) is a State listed endangered species that occurs in wintering populations on Port property west of the proposed project site (i.e. Parcels 3, 4, and 5). Also, the American bald eagle (*Haliaeetus leucocephalus*) is State listed as threatened and has been observed roosting along the Columbia River. This species has occupied an active nest several miles west of the project area on Port property (i.e. Parcel 3) for many years. Given the distance of these sensitive species from the source of proposed construction noise and activity (distance is greater than 1 mile), it is unlikely that those sensitive species would be affected by the project. However, construction activities should be limited to the project site or accessing the area from the north or the east of the construction site.

c. Is the site part of a migration route? If so, explain.

The site is within the Pacific Flyway, the north-south migratory route for birds within the Americas. Because the project area is in an urban industrial locale, critical stopover areas are not expected to occur on site.

The use of the nearby Columbia River as a migration route for salmonids is discussed above in Section 5.b of this SEPA checklist.

d. Proposed measures to preserve or enhance wildlife, if any:

Wildlife would not be directly affected by the project. Indirect effects from noise would be minor.

The project involves discharging up to 6,200 gpm (minus about 3.47 gpm of water lost in the treatment process) to the Columbia River. This water would be treated using a widely-used and reliable technology for decontaminating groundwater that would comply with an NPDES permit. While 6,200 gpm is generally considered a large volume of water, relative to the Columbia River, it would not be a large discharge and it would not adversely alter flow and therefore affect fish and other aquatic species. The outfall location is along the riverbed which provides for significant mixing and further avoids impacts to fish.

6. **Energy and natural resources**

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc.

Electricity would be used to run the groundwater pump and to operate the machinery and monitoring equipment associated with the treatment facility.

b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe.

While the air strippers would extend over the adjacent building by about 21 feet, potentially blocking direct light during certain times of the day, the footprint of the facility is very small. Therefore, no appreciable loss in the potential for solar energy at nearby properties is expected.

c. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any:

The well motor will be equipped with a variable speed drive as a means to conserve energy.

7. Environmental health

a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal? If so, describe.

Leakage from the contaminated groundwater conveyance pipeline could present an environmental health hazard. In addition, an accidental spill of liquid sodium metabisulfite or liquid chlorine, chemicals used in the groundwater treatment process, could also create an environmental health hazard. Such hazards are anticipated to be extraordinarily low given the precautions that will be built into the project design and operation and monitoring procedures.

1) Describe special emergency services that might be required.

No special emergency services will be required. Standard emergency services required for the facility will be related to general industrial hazards (e.g., high-voltage electricity, heavy equipment, etc.).

2) Proposed measures to reduce or control environmental health hazards, if any:

Chlorine will be stored onsite in a double wall containment tank with a volume of approximately 2,000 gallons. Sodium metabisulfite will also be stored in a double wall containment tank. The contaminated groundwater conveyance will be designed to avoid leakage to the extent practical, and will be installed in accordance with Spill Prevention Control and Countermeasures regulations (40 CFR 1912). Conveyance lines will be designed with tightly sealed joints and would be inspected frequently to assure that there is no leakage. As part of the engineering design for the interim action, a plan will be developed for containment of the contaminant plume in groundwater if the interim action pumping well fails or is shut down for maintenance.

b. Noise

1) What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)?

Ambient noise would not affect the project.

2) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from the site.

Short-term noise effects would result from well and building construction, and particularly by constructing an open trench through existing hard surfaces. Long-term noise effects would be associated with pump operation and air stripper operation which would occur all hours of the day at maximum levels of 98 decibels (dBA) near the air strippers. The site is zoned for heavy industrial use.

3) Proposed measures to reduce or control noise impacts, if any:

The groundwater pumps would be placed inside a pump house thus substantially buffering noise emissions. Noise buffering measures would also be implemented for the air strippers (i.e., the blowers). Noise abatement measures currently being considered include installing silencers on the blowers or enclosing the blowers in a concrete structure.

8. **Land and shoreline use**

a. What is the current use of the site and adjacent properties?

The specific site for the well and pump house is currently vacant. It was a portion of the former site of Swan Manufacturing Company (SMC). The building associated with SMC has been demolished. A new tenant is expected on the site prior to well construction. The site for the new pipeline is used for access to the various commercial buildings and parking lots within the commercial-industrial complex. The site for the groundwater treatment facility is currently paved.

b. Has the site been used for agriculture? If so, describe.

No.

c. Describe any structures on the site.

There are currently no structures on the site for the well or pump house. However, a new port tenant with a temporary building is expected to be on the well site prior to project construction. The new conveyance pipeline would be aligned across a currently paved area. The treatment facility would be located adjacent to an existing Port building. Surrounding the specific sites for the new project facilities are paved parking lots, industrial buildings and petroleum storage tanks.

d. Will any structures be demolished? If so, what?

No structures would be demolished. However, existing paved surfaces along the new pipeline route would be cut in order to install the wastewater discharge pipeline. The paved surface will be restored immediately after pipeline installation.

e. What is the current zoning classification of the site?

The project site (for all new project-related facilities) is zoned as “Heavy Industrial – IH.”

f. What is the current comprehensive plan designation of the site?

The project site (for all new project-related facilities) is designated in the comprehensive plan as “Industrial.”

g. If applicable, what is the current shoreline master program designation of the site?

For areas on the project site subject to construction, there are no shoreline environmental designations pursuant to the Washington State Shoreline Master Program Shoreline Environment Designations as administered by the City of Vancouver and Clark County. Treated groundwater will be discharged through an existing 36-inch pipe that outfalls to the Columbia River. The outfall is located in an area designated as Urban High Intensity. The Special Columbia River Management Area is about one mile upstream, and lands with the Urban Conservancy designation are northwest of the project site (Figure 6).

h. Has any part of the site been classified as an "environmentally sensitive" area? If so, specify.

The City of Vancouver considers the following as critical areas under its critical areas protection ordinance: fish and wildlife habitat conservation areas, wetlands, frequently flooded areas, critical aquifer recharge areas, and geohazard areas. Based on Clark County GIS mapping and field confirmation, there are no fish and wildlife habitat conservation areas near or underlying project sites that would be affected by the interim action. The Clark County Wetland Inventory identifies the excavated stormwater pond located along the western edge of a portion of the proposed treated water pipeline as a wetland. This pond would not be affected by the project. A recent topographic survey shows that the sites for the conveyance lines, well, and pump house are located on lands at elevations slightly below the 100-year flood elevation. The pump house would be constructed at an elevation above the flood zone and the water conveyances would be buried therefore making flood issues inconsequential. The entire project site and surrounding area is mapped as moderate to high liquefaction hazard. The area is rated “low” earthquake ground motion hazard. The project would not increase the risk of a geologic hazard. The project is located in the immediate proximity of two wellhead protection areas, one public (the Port of Vancouver’s wells) and one private (Vanalco). The private well is no longer operating. The new treated water pipeline would cross the outer edge of the “10 year zone of contribution” mapped for the Port’s well protection area. This designation implies that should groundwater be contaminated within this zone, that contamination at the wellhead would be expected within 10 years. The purpose of the project is to treat contaminated groundwater and to contain it from spreading further. The project is designed to protect nearby wellhead protection areas.

The entire project site is underlain by the Troutdale Aquifer, which was recently designated as a sole source aquifer by the U.S. Environmental Protection Agency (EPA). The purpose of this designation is to develop programs that reduce the risk of contamination to this potential community supply drinking water aquifer. The interim action is designed to extract contaminated groundwater from the aquifer and to prevent the risk of its spreading.

i. Approximately how many people would reside or work in the completed project?

No additional employees would be hired to maintain and operate the new facilities. No one would be “housed” in any of the new facilities. The facilities are designed to be automated with little oversight required.

j. Approximately how many people would the completed project displace?

No one would be displaced by the project.

k. Proposed measures to avoid or reduce displacement impacts, if any:

Not applicable.

l. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any:

The project is fully compatible with existing and projected land uses. No additional assurances are necessary.

9. Housing

a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing.

Not applicable.

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing.

Not applicable.

c. Proposed measures to reduce or control housing impacts, if any:

Not applicable.

10. Aesthetics

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed?

The two proposed air strippers would be at an overall height of about 65 feet. Exterior building materials would primarily be steel, concrete and aluminum.

b. What views in the immediate vicinity would be altered or obstructed?

The air stripper towers would alter views slightly given their heights in relation to other building heights in the project vicinity. The air strippers would be about 65 feet in elevation each; whereas the adjacent Port building is about 44 feet tall. There are no height restrictions in the zone where the strippers will be located. Since each air stripper is proposed to be about 10 feet in diameter, the visual alteration from the towers would be minor.

c. Proposed measures to reduce or control aesthetic impacts, if any:

Project facilities would either be buried or would be enclosed within structures that blend in with the surrounding environment.

11. Light and glare

a. What type of light or glare will the proposal produce? What time of day would it mainly occur?

The project would produce minimal light and glare. The air strippers would be illuminated throughout the night by either lighting placed directly on the facilities or by lighting placed on a new, nearby post. The lighting would be consistent with that permitted within an industrial zone.

b. Could light or glare from the finished project be a safety hazard or interfere with views?

The light generated by the project facilities would not create a safety hazard nor interfere with views.

c. What existing off-site sources of light or glare may affect your proposal?

Off-site light or glare would not affect the project.

d. Proposed measures to reduce or control light and glare impacts, if any:

No measures are proposed to reduce or control light and glare since impacts would be minor.

12. Recreation

a. What designated and informal recreational opportunities are in the immediate vicinity?

The Columbia River provides informal recreational boating and fishing opportunities in the project area. The project would not affect recreational boating or fishing opportunities on the Columbia River.

b. Would the proposed project displace any existing recreational uses? If so, describe.

No.

c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any:

No mitigation measures are proposed because there are no recreation impacts associated with the proposed project.

13. Historic and cultural preservation

a. Are there any places or objects listed on, or proposed for, national, state, or local preservation registers known to be on or next to the site? If so, generally describe.

The archaeological predictive model for Clark County identifies the Vancouver Lake Lowlands as a high probability area for containing cultural resources.

There are no protected historic or cultural resources within the project site. The site is filled and either developed already or disturbed from the demolition of former buildings.

b. Generally describe any landmarks or evidence of historic, archaeological, scientific, or cultural importance known to be on or next to the site.

Clark County mapping shows no such resources on or next to the project site. The site and immediate surrounding

area is intensely developed. There are no landmarks or evidence of any historic, archaeological, scientific, or cultural resources on or immediately adjacent to the site, although the Clark County predictive model identifies potential resources near the site due to its location in the Vancouver Lake Lowlands.

c. Proposed measures to reduce or control impacts, if any:

In the event that resources are discovered, all work in the vicinity will cease and the Washington State Office of Archaeology and Historic Preservation will be contacted.

14. Transportation

a. Identify public streets and highways serving the site, and describe proposed access to the existing street system. Show on site plans, if any.

As shown on Figure 2, the site is accessed via Mill Plain Boulevard (Route 501) and Fourth Plain Boulevard/NW Lower River Road. Access to the facilities would be provided by Saint Francis Lane and other existing interior roads within the complex.

b. Is site currently served by public transit? If not, what is the approximate distance to the nearest transit stop?

While the proposed project site is not served directly by public transit, there is a C-Tran bus stop on Mill Plain Boulevard across from Panasonic approximately one-fourth to one-half mile from the site.

c. How many parking spaces would the completed project have? How many would the project eliminate?

The project would not require any additional parking. An equipment storage area would be reduced in size near the Port building; however, no parking spaces would be eliminated by developing the groundwater treatment plant.

d. Will the proposal require any new roads or streets, or improvements to existing roads or streets, not including driveways? If so, generally describe (indicate whether public or private).

The project would not require any new roads or streets, or improvements to existing roads or streets.

e. Will the project use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe.

The new conveyance line would be aligned adjacent to a small rail spur and would end at the boundary of a railroad mainline. The nearest construction area would occur about 1,400 feet from the Columbia River, the nearest navigable waterway. The project will discharge treated water to the Columbia River.

f. How many vehicular trips per day would be generated by the completed project? If known, indicate when peak volumes would occur.

The project would not generate any additional vehicular trips beyond incidental site inspections. Project maintenance would primarily occur in tandem with other Port maintenance activities within the project environs.

g. Proposed measures to reduce or control transportation impacts, if any:

The project would not create any permanent transportation impacts. Access to all facilities within the project environs would be unimpeded during construction.

15. Public services

a. Would the project result in an increased need for public services (for example: fire protection, police protection, health care, schools, other)? If so, generally describe.

The project would not be expected to create an increase in the need for public services. The project would not store flammable materials and facilities will be designed to prevent vandalism.

b. Proposed measures to reduce or control direct impacts on public services, if any.

Facilities would be designed to prevent vandalism and hazardous materials will be stored in double-walled tanks.

16. Utilities

a. Circle (highlight) utilities currently available at the site: electricity, natural gas, water, refuse service, telephone, sanitary sewer, septic system, other.

b. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed.

The project would require electricity and water and wastewater conveyance and discharge. Electrical lines would be extended to provide electricity to the groundwater pump station and the groundwater treatment plant. Electric service is provided by Clark Public Utilities. An underground pipeline conveying contaminated groundwater would extend from the well site to the groundwater treatment plant. A second underground pipeline conveying highly treated groundwater would tie into an existing 36-inch storm drain which outfalls nearby in the Columbia River. Backwash water from the iron/manganese filter would be discharged to the sanitary sewer. A sewer connection would be installed under the supervision of the City of Vancouver.

Based on hydraulic analyses conducted for the project, the existing storm drain shared by the Port of Vancouver and City of Vancouver has sufficient capacity to convey the treated discharge water plus any stormwater. Only on rare occasions (e.g., 25-year, 1 hour storm flow) would the pipeline be expected to reach full flow capacity. Under these rare conditions, discharge would be momentarily delayed until after peak storm flows have subsided. Level sensors would be included in the discharge line/36-inch existing line connection to automatically turn flows off from the extraction/treatment system should one of these rare peak flow events occur.

New utility lines would follow existing roads and would be constructed by open trench method. Trenches would be backfilled and repaved following utility line installation.

C. SIGNATURE

The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

Signature: ..... (Patty Boyden for Port of Vancouver)

Date Submitted: 12/21/07

D. SUPPLEMENTAL SHEET FOR NONPROJECT ACTIONS

(do not use this sheet for project actions) ---**This section does not apply to the subject project.**

Because these questions are very general, it may be helpful to read them in conjunction with the list of the elements of the environment.

When answering these questions, be aware of the extent the proposal, or the types of activities likely to result from the proposal, would affect the item at a greater intensity or at a faster rate than if the proposal were not implemented. Respond briefly and in general terms.

1. How would the proposal be likely to increase discharge to water; emissions to air; production, storage, or release of toxic or hazardous substances; or production of noise?

   Proposed measures to avoid or reduce such increases are:

2. How would the proposal be likely to affect plants, animals, fish, or marine life?

   Proposed measures to protect or conserve plants, animals, fish, or marine life are:

3. How would the proposal be likely to deplete energy or natural resources?

   Proposed measures to protect or conserve energy and natural resources are:

4. How would the proposal be likely to use or affect environmentally sensitive areas or areas designated (or eligible or under study) for governmental protection; such as parks, wilderness, wild and scenic rivers, threatened or endangered species habitat, historic or cultural sites, wetlands, floodplains, or prime farmlands?

   Proposed measures to protect such resources or to avoid or reduce impacts are:

5. How would the proposal be likely to affect land and shoreline use, including whether it would allow or encourage land or shoreline uses incompatible with existing plans?

   Proposed measures to avoid or reduce shoreline and land use impacts are:

6. How would the proposal be likely to increase demands on transportation or public services and utilities?

   Proposed measures to reduce or respond to such demand(s) are:

7. Identify, if possible, whether the proposal may conflict with local, state, or federal laws or requirements for the protection of the environment.

Attachment A

The following tables are provided in support of the analyses and conclusions described in the Environmental Checklist.

Table 1. Summary of Predicted Flow Rates, Concentrations, and Removal Efficiencies

Year of Operation	Maximum Influent TCE + PCE Concentration (ug/L)	Maximum Flow Rate (gpm)	Annual Average Flow Rate (gpm)	Removal of TCE Provided by Air Stripping (%)	Discharge Concentration of TCE (ug/L)
1	200	2,500	1400	99.95	0.5
2	139	2,500	1500	99.92	0.5
3	112	2,624	1650	99.91	0.5
4	104	2,862	1800	99.90	0.5
5	91	3,101	1950	99.89	0.5
6	81	3,339	2100	99.87	0.5
7	68	3,578	2250	99.85	0.5
8	56	3,816	2400	99.82	0.5
9	40	4,055	2550	99.75	0.5
10	35	4,293	2700	99.71	0.5
11	27	4,532	2850	99.62	0.5
12	23	4,770	3000	99.56	0.5
13	19	4,770	3000	99.47	0.5
14	17	4,770	3000	99.41	0.5
15	15	4,770	3000	99.33	0.5
16	13	4,770	3000	99.23	0.5
17	12	4,770	3000	99.17	0.5
18	11	4,770	3000	99.10	0.5
19	10	4,770	3000	99.00	0.5
20	9	5,009	3150	98.89	0.5
21	8	5,247	3300	98.75	0.5
22	8	5,486	3450	98.75	0.5
23	7	5,724	3600	98.57	0.5
24	7	5,963	3750	98.57	0.5
25	7	6,200	3900	98.57	0.5

TCE – Trichloroethylene
A/W – Air Stripper Air:Water Ratio

Table 2. Estimated Air Emissions

	Trichloro-ethylene (TCE)	**Tetrachloro-ethylene (PCE)**	**1,1-Dichloro-ethane (1,1-DCA)**	**1,1-Dichloro-ethene (1,1-DCE)**	**1,2-Dichloro-ethene (1,2-DCE)**	**1,1,1-Trichloro-ethane (1,1,1-TCA)**
Groundwater Concentration (ug/l)	200	160	20	1	80	20
Mass Emitted[1] (lbs/year)	2,017	1,613	202	10	807	202
WAC SQER (lbs/year)	50	500	43,748	10,500	43,748	43,748
Dispersion Model[2] (ug/m^3)	0.35	0.28	0.45	0.02	1.81	0.45
ASIL2 (ug/m^3)	0.59	1.10	2,700	67	2,600	6,400

Notes:

[1] Using mass balance from groundwater analytical data and an assumed flow of 2,300 gpm.

[2] Annual averaging time for TCE and PCE; 24-hour averaging time for 1,1,1-TCA, 1,1-DCA, 1,1 DCE, and 1,2-DCE

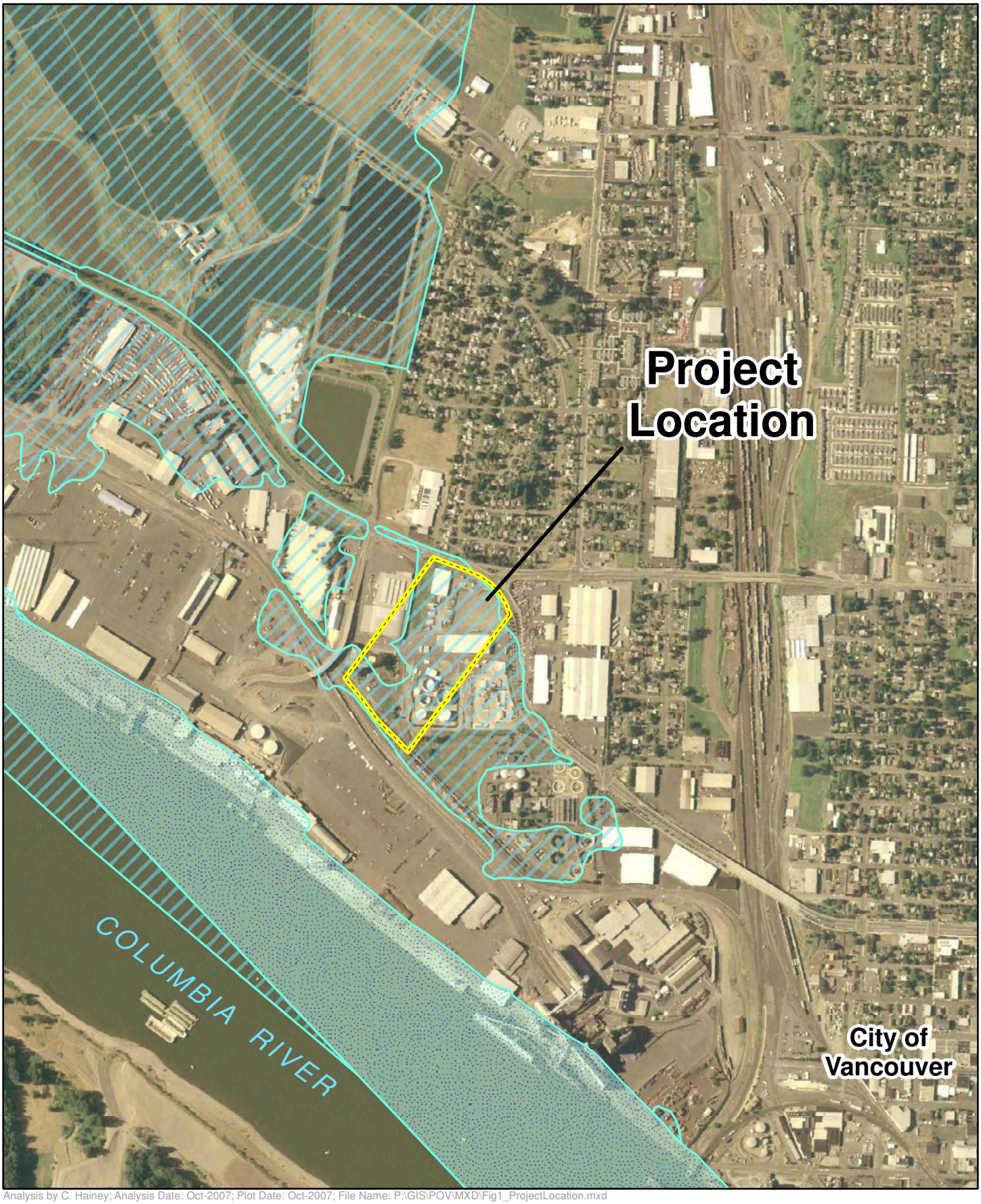
WAC SQER - Washington Administrative Code Small Quantity Emission Rates (WAC 173-460-80 (2)(e))

ASIL - Acceptable Source Impact Level (WAC 173-460-150 (2) & (3))

Dispersion Model - SCREEN 3 model output (assumes 65 foot stack height, 1 foot diameter stack, with building downwash and overpass receptor height).

NA – Not Available

Table 3. Air Permits Within a One-Mile Radius of the Proposed Groundwater Treatment Plant Site				
Name	**Address**	**Source Type**	**Latitude**	**Longitude**
Albina Asphalt	1300 W Eighth Street; Vancouver WA	Small Source	45.6273	-122.6839
Almega Enterprises Inc./Vancouver	1305 W 17th Street; Vancouver WA	Small Source	45.6339	-122.6844
City of Vancouver/Westside Wastewater Treatment Plant	1800 Kotobuki Way; Vancouver WA	Opt-Out	45.6353	-122.6948
Clark County Courthouse	1200 Franklin Street; Vancouver WA	Small Source	45.6308	-122.6780
Columbia Cascade Company	1801 W 20th Street; Vancouver WA	Small Source	45.6347	-122.6889
Columbia Vista Corp/Fruit Valley	4303 Fruit Valley Road; Vancouver WA	Small Source	45.6538	-122.6909
Columbia Vista Corporation/Vancouver	4303 Fruit Valley Road; Vancouver WA	Small Source	45.6537	-122.6910
Emerald Petroleum Services	1300 W 12th Street; Vancouver WA	Small Source	45.6307	-122.6840
Express Cleaner	914 Daniels Street; Vancouver WA	Small Source	45.6286	-122.6750
Fabricated Products Inc.	3201 NW Lower River Road; Vancouver WA	Small Source	45.6431	-122.7067
Food Express Inc.	2901 NW Lower River Road; Vancouver WA	Small Source	45.6424	-122.7047
Frito-Lay Inc.	4808 Fruit Valley Road; Vancouver WA	Small Source	45.6569	-122.6916
Fruit Valley Chevron	3815 Fruit Valley Road; Vancouver WA	Gas Station	45.6498	-122.6918
General Chemical Corporation - Vancouver Works	2611 W 26th Street Extension; Vancouver WA	Small Source	45.6401	-122.6997
Glacier Northwest Inc. - Vancouver Concrete	2327 W Mill Plain Boulevard; Vancouver WA	Small Source	45.6377	-122.6953
Great Western Malting Company	1701 Industrial Way; Vancouver WA	Opt-Out	45.6318	-122.6904
Humane Society for Southwest Washington	2121 St. Francis Lane; Vancouver WA	Small Source	45.6385	-122.6995
Kinder Morgan Bulk Terminals Inc.	2735 NW Harborside Drive; Vancouver WA	Small Source	45.6401	-122.7045
Lafarge North America Inc.	1217 W Eighth Street; Vancouver WA	Small Source	45.6271	-122.6858
Northwest Packing Company	1701 W 16th Street; Vancouver WA	Small Source	45.6329	-122.6896
NuStar Energy LP - Vancouver/Main	2565 NW Harborside Drive; Vancouver WA	Opt-Out	45.6358	-122.7028
Panasonic Shikoku Electronics Corporation of America	2001 Kotobuki Way; Vancouver WA	Opt-Out	45.6378	-122.6928
Plaid Pantry No 112	1002 W Fourth Plain Boulevard; Vancouver WA	Gas Station	45.6405	-122.6812
Port of Vancouver USA	3101 NW Lower River Road; Vancouver WA	Gas Station	45.6435	-122.7036
Tesoro Refining and Marketing Company/Vancouver Terminal	2211 St Francis Lane; Vancouver WA	Opt-Out	45.6375	-122.6970
Tetra Pak Materials LP	1616 W 31st Street; Vancouver WA	Small Source	45.6443	-122.6884
The Columbian	701 W Eighth Street; Vancouver WA	Small Source	45.6269	-122.6788
Trimac Panel Products	2601 NW Lower River Road; Vancouver WA	Small Source	45.6323	-122.6944
United Grain Corporation	1905 NW Harborside Drive; Vancouver WA	Opt-Out	45.6305	-122.6929
Vancouver Ice & Fuel Oil Company	1112 W 7th Street; Vancouver WA	Small Source	45.6266	-122.6830
Vancouver Iron & Steel Inc.	1200 W 13th Street; Vancouver WA	Small Source	45.6317	-122.6839
Vantage Technology Inc.	1000 W 8th Street; Vancouver WA	Small Source	45.6274	-122.6825
Wellons Inc.	2525 W Firestone Lane; Vancouver WA	Opt-Out	45.6506	-122.6972
WSCO Petroleum No 709	1910 W Fourth Plain Road; Vancouver WA	Gas Station	45.6406	-122.6917



Analysis by C. Hainey; Analysis Date: Oct-2007; Plot Date: Oct-2007; File Name: P:\GIS\POV\MXD\Fig1_ProjectLocation.mxd

Parametrix

0 500 1,000 Feet

FEMA 100 Year Floodplain

- Floodway
- Floodway Fringe

Figure 1
Site Location Map

Port of Vancouver
Groundwater Pump & Treat
Interim Action

Parametrix DATE: Oct 30, 2007 FILE: PO1940006P0407-F02

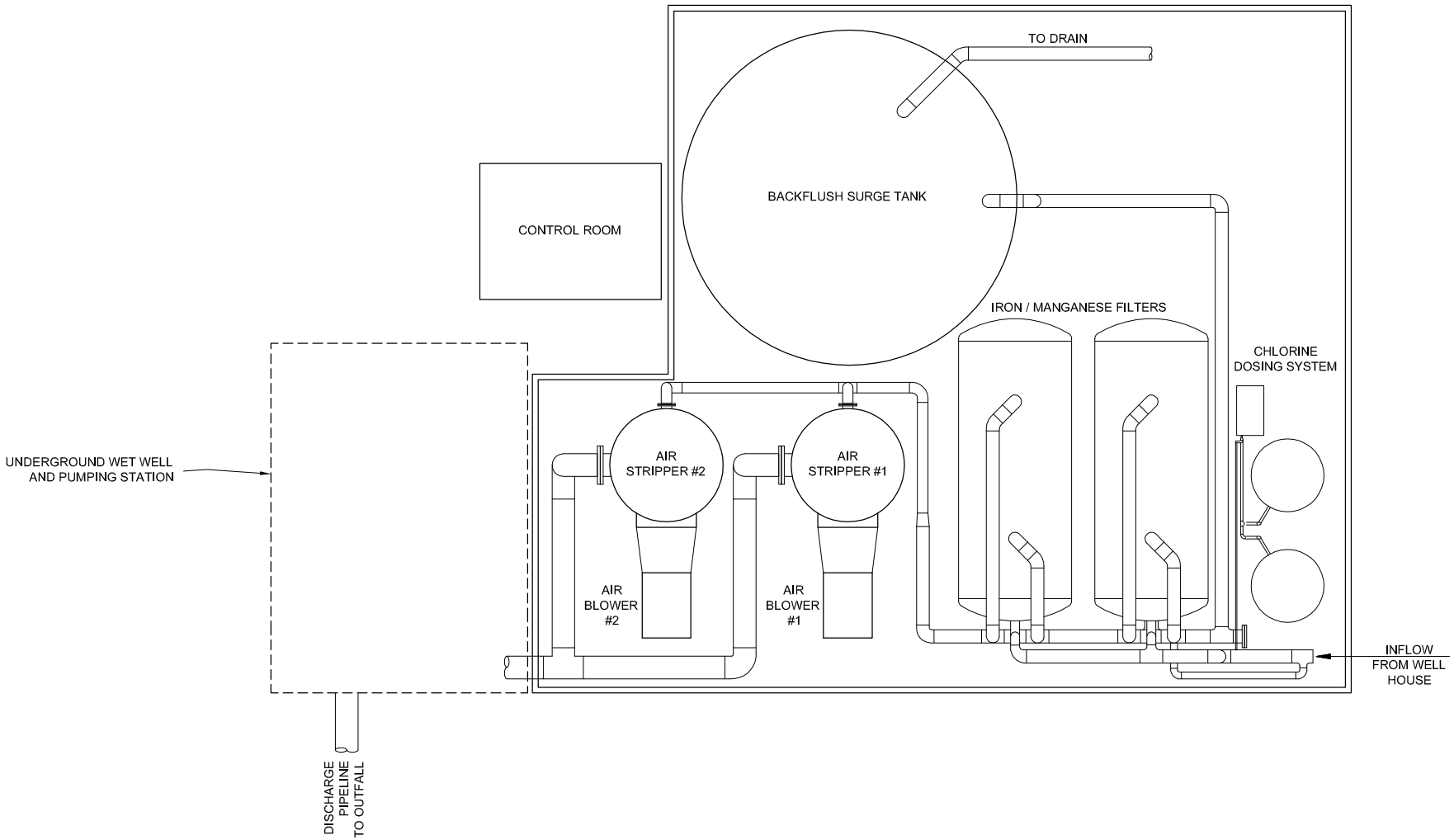
N

0 300'

SCALE IN FEET

Figure 2
Site Layout

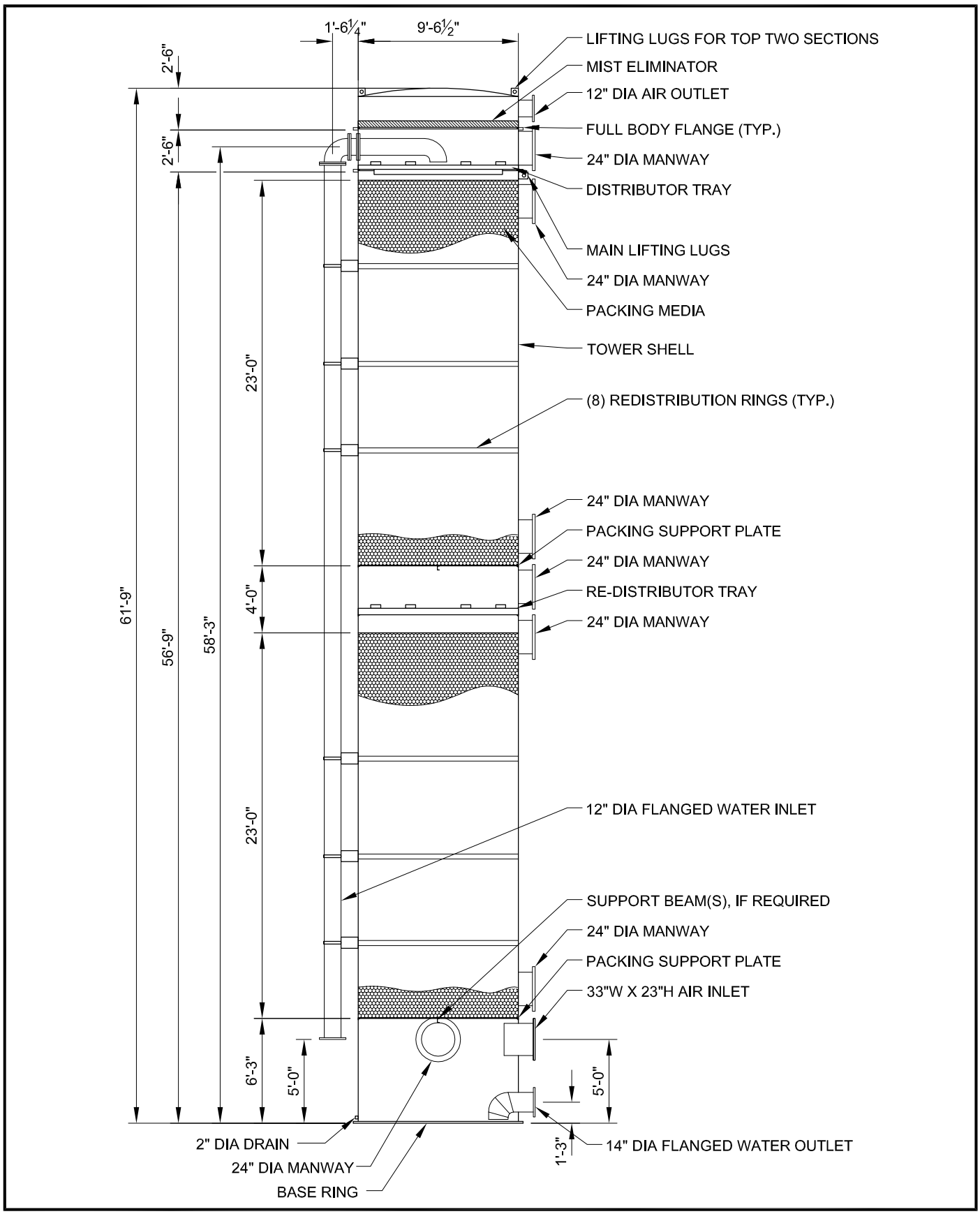
PORT OF VANCOUVER
GROUNDWATER PUMP & TREAT
INTERIM ACTION



Parametrix DATE: Nov 27, 2007 FILE: P194006697

Figure 3
Groundwater Treatment Plant Layout

GROUNDWATER PUMP & TREAT - INTERIM ACTION
PORT OF VANCOUVER, WASHINGTON



Parametrix DATE: Oct 23, 2007 FILE: PO1940006P0407-F05

SOURCE: LAYNE CHRISTENSEN CO.

0 1/8
SCALE IN FEET

Figure 4
Air Stripper Detail
PORT OF VANCOUVER
GROUNDWATER PUMP & TREAT
INTERIM ACTION

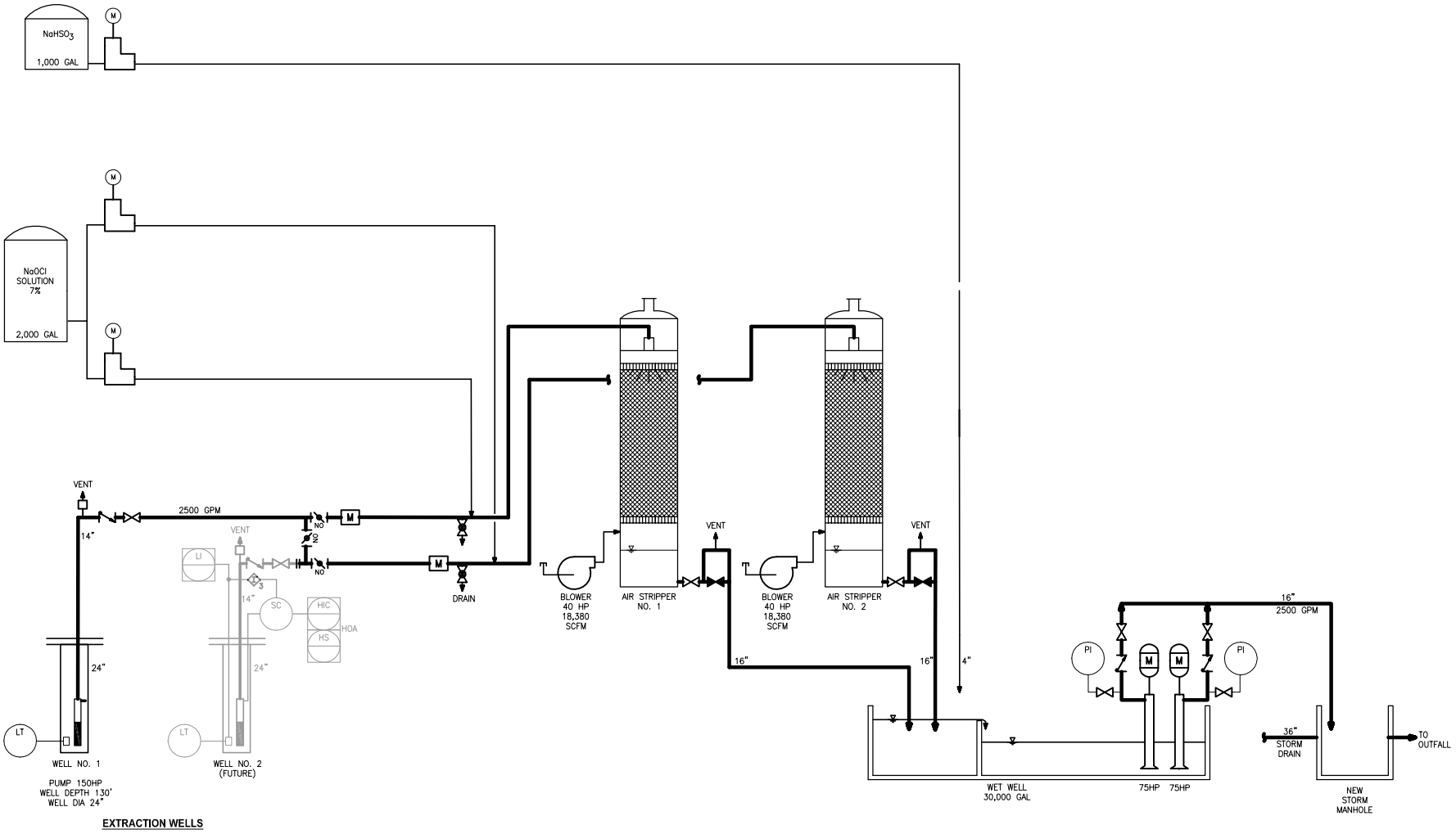
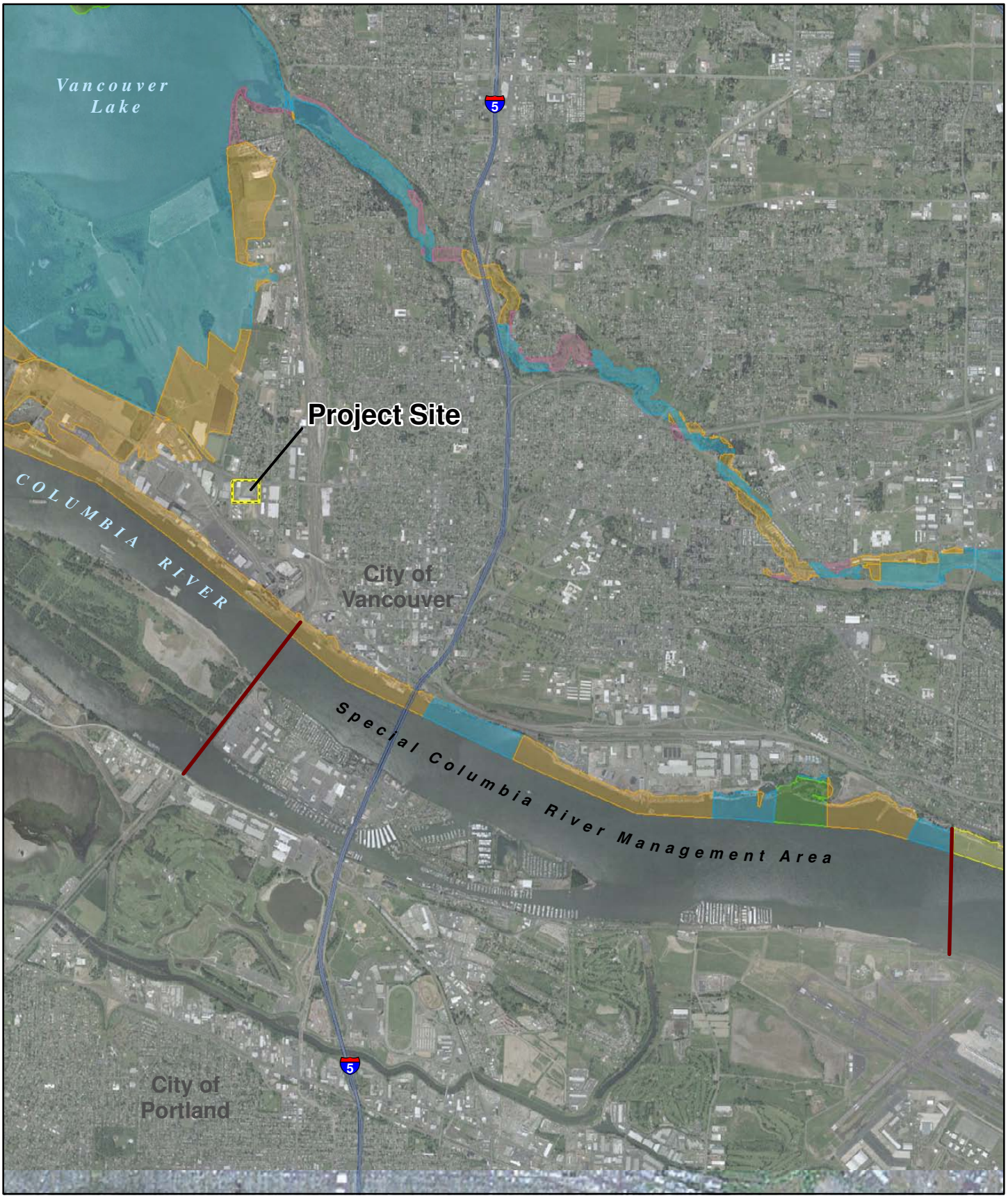


Figure 5
Conceptual Treatment Process

GROUNDWATER PUMP & TREAT - INTERIM ACTION
PORT OF VANCOUVER, WASHINGTON



Analysis by C. Hainey; Analysis Date: November-2007; Plot Date: November-2007; File Name: P:\GIS\POV\MXD\POV_ShorelineE_Designations.mxd

Parametrix

Site Location

0 0.5 1
Miles

- Urban Low Intensity
- Urban Medium Intensity
- Urban High Intensity
- Urban Conservancy
- Urban Natural
- Project Site

Figure 6
Shoreline Management Area Designations

Interim Action Engineering Design Report
Port of Vancouver, Washington