DEPARTMENT OF ECOLOGY
State of Washington

Golder Associates

RESPONSIVENESS SUMMARY

SeaTac Development (aka MasterPark Lot C) Site Remedial Investigation/Feasibility Study Report, Draft Cleanup Action Plan, and SEPA Determination

Public Comment Period: April 29 – May 31, 2011

Prepared by
Washington State Department of Ecology
Northwest Regional Office
3190 160th Ave SE., Bellevue, WA 98008

October 2011

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1.0 INTRODUCTION

The SeaTac Development site (also known as MasterPark Lot C) is located at 16025-16223 International Boulevard in SeaTac, Washington. Currently, the property is being used as a commercial parking lot serving SeaTac Airport. Ground water beneath the site is contaminated with gasoline range petroleum hydrocarbons and associated chemical compounds. It is listed in Ecology's known and suspected contaminated sites list and in its databases under Facility Site ID number 38258847.

In July 2009, the Department of Ecology (Ecology) and Sea-Tac Investments LLC, ANSCO Properties, LLC, and Scarsella Brothers Inc. (Potential Liable Parties (PLPs)) entered into a legal agreement called an Agreed Order. Under the agreement, the responsible parties conducted a remedial investigation of contamination at the site, evaluated cleanup alternatives, and developed a plan to clean up contamination at the site according to state regulations and standards. The results of this work are provided in a draft Remedial Investigation/Feasibility Study Report (RI/FS Report) and Draft Cleanup Action Plan (DCAP). A State Environmental Policy Act (SEPA) Checklist and Determination of Non-Significance (DNS) on the CAP were also provided for public comment.

A public comment period was held April 29 – May 31, 2011 for the draft RI/FS Report, DCAP, and State Environmental Policy Act (SEPA) Determination. Ecology received four comments during the comment period. This responsiveness summary documents the comments received and Ecology's responses. Appropriate revisions will be made to the documents in the comment period in order to finalize them in fulfillment of the Agreed Order.

More details on the SeaTac Development site and related documents are available at the Washington State Department of Ecology website:

https://fortress.wa.gov/ecy/gsp/Sitepage.aspx?csid=5994

Section 2.0 of this Responsiveness Summary provides Ecology's specific responses comments received. In **Appendix A**, all the original comments are documented in their entirety and as close as possible to original format. **Appendix B** consists of an Addendum to the RI/FS and Draft CAP that was made in response to substantive comments from the Port of Seattle.

2.0 COMMENTS RECEIVED AND ECOLOGY'S RESPONSES

2.1 Rachelle Goda: Email Sent to Ecology Site Manager Jerome Cruz on Friday, April 22, 2011 7:21 PM

How far from the site area are contaminated?

Ecology's Response: Past investigations revealed that soil contamination is within the property boundary. The area of contaminated groundwater is wider, extending north past south 160th Street, and also west onto the adjoining property to the MasterPark Lot C Facility. However, groundwater is at least 50 feet deep beneath the site. The attached maps should help with the more detailed description provided below.

For soil, a source of gasoline impacted soils exists within the MasterPark Facility near the location of the former gasoline USTs at the northwest corner of the property. Relative concentrations of gasoline (and BTEX) in the source area are highest at depths between 10 feet and 40 feet below ground surface and decrease in concentration as you go deeper. It is limited to a zone with an area of approximately 50 to 60 foot diameter. There are some smaller limited spots of petroleum hydrocarbon impacted soil beneath the asphalt parking lot in the MasterPark Facility.

The property which is further north of the MasterPark property may contain its own subsurface contamination source. However, the property owner has not agreed to give access to their property. The approach adopted will be to observe the groundwater concentrations in nearby wells while groundwater cleanup at the MasterPark Facility is carried out to see if it will indicate a source at this nearby property that impacts groundwater.

Ground water is a key medium of contamination at the site. Groundwater is between 45 and 115 feet below land surface. Groundwater analytical results confirm that the source of impact is bounded by MW-12 to the north, MW-14 to the south, MW-18 to the east, and MW-13 to the west. This is demonstrated by gasoline isoconcentration contour maps that were developed for the 2007-2008 (Figure 4-3) and May 2009 (Figure 4-4) groundwater sampling events, attached as a file to this message. These figures show that the highest concentrations of gasoline were detected in MW-12, MW-13, MW-14, and MW-18. With distance from these wells, the concentration of gasoline in groundwater steadily decreases.

The plume is roughly 640 feet across.

The plume is well delineated. The groundwater gasoline plume was estimated in the RI/FS to have migrated no more than 140 feet beyond MW-22, which is depicted in Figure 4-6.

The gasoline plume will eventually be further delineated northwest of MW-22 through the installation of an additional well(s).

How was it determined that no drinking source is contaminated?

Ecology's Response: There are no potable groundwater supply wells within a mile of the Site in the general down gradient direction (west, southwest or northwest) from the Site. The closest groundwater supply well is in the Washington Memorial Park Cemetery, south of the Site, and is used for watering. However, this cemetery well has not been impacted by Site releases (as per results from Ecology's 2006 and Golder's 2001 sampling events). Therefore, there are no current groundwater exposure pathways to off-Site humans from drinking water impacted by Site release.

There is no known discharge of Site groundwater to surface water in the area, including the potential wetland area and man-made pond on the cemetery property south of the Site.

Ground water samples collected from monitoring wells surrounding the site show no petroleum hydrocarbon compounds above cleanup levels in the water. This helped establish the limits of most of the plume in relationship to the nearest potable groundwater supply well, which is over a mile away.

What health risks are there now, because of the contamination?

Ecology's Response: Future MasterPark Facility construction/remediation workers could become exposed by direct contact and incidental ingestion to Site near-surface soils (<15 feet) during construction excavation or impacted soil removal activities in the vicinity of the source area (former gasoline USTs at the MasterPark Facility).

There is a potential risk from vapor intrusion; however, based on soil gas studies conducted, there is little if any risk because the levels are very low, as low or lower than air borne levels measured from nearby street traffic (ambient air).

Who will oversee and manage the cleanup process from the contaminated site?

Ecology's Response: The Department of Ecology and the Potentially Liable parties (PLPs) are presently under an Agreed Order to conduct a Remedial Investigation and Feasibility Study. Ecology is the state lead that ensures that the cleanup process follows the Model Toxics Control Act (MTCA). Technical work is paid for by the PLPs.

What are the risk for any residents nearby when the cleanup process occur?

Ecology's Response: There should be little if any risk when the preferred remedial alternative is carried out to clean up the groundwater contamination.

The air sparging system and soil vapor extraction systems will be on the property and off limits to the public. There is a Health and Safety, a Performance and Compliance Monitoring Plan, and a Quality Assurance Project Plan to ensure the systems are implemented safely and that the remediation is effective and protective. Groundwater and air will be monitored during and after the operations to ensure the systems are performing and that existing hazards to people at the site are minimized.

How was it known that the area was contaminated?

Ecology's Response: During development of the property in 2000, Sea-Tac Investments found petroleum contamination in soil and groundwater. High levels of gasoline were found in the groundwater aquifer 50-60 ft. beneath the property. Contamination seemed to be from equipment operations and old underground storage tanks used by the former owner or former tenants. In 2001, Sea-Tac Investments entered into Ecology's Voluntary Cleanup Program to investigate and clean up some of the contamination. Ecology gave Sea-Tac Investments a "No Further Action" letter for cleanup of the soil. The gasoline contamination in the aquifer extends beyond property boundaries and was not cleaned up at that time.

There were later investigations to find the source of contamination in the aquifer. A series of investigations and remedial actions were conducted starting in September 2000 with a Phase I Environmental Site Assessment (ESA) followed by Phase II ESA investigations and culminating in September 2001 with an independent remedial action (IRA) conducted in coordination with property development. Ecology performed groundwater sampling at the Site in 2006, and remedial Site investigations resumed in 2007. The activities and results of these investigations are reported in the RI/FS report that is available to the public for review and comment.

How is the clean-up being funded?

Ecology's Response: It is being paid for by the Potentially Liable Parties or PLPs (Sea-Tac Investments LLC, Scarsella Bros. Inc., and ANSCO Properties, LLC.). Public funds are not being used for the cleanup effort.

Are there enough funding to clean-up the contamination?

Ecology's Response: It is the PLPs responsibility to ensure they have sufficient funding under Model Toxics Control Act administrative orders. To actually carry out the cleanup, we will see what mechanism will be used to execute the cleanup, such as a consent decree or agreed order. For the present Agreed Order, the PLPs have been funding the investigations that produced the RI/FS report and DCAP. Ecology has been billing the PLPs for Ecology's direct oversight on the project. An agreed order or consent decree would obligate the PLPs to fund the cleanup.

What is the role of SeaTac Investment LLC, ANSCO Properties LLC, and other businesses that caused the contamination in regarding to funding and clean-up?

Ecology's Response: They are the PLPs and are under an Agreed Order to complete an RI/FS and DCAP. An Agreed Order is a legal document that formalizes the agreement between the PLPs and Ecology for actions needed at the site.

Are those businesses listed above involve in clean-up and funding?

Ecology's Response: It is being paid for by the Potentially Liable Parties or PLP's (Sea-Tac Investments LLC, Scarsella Bros. Inc., and ANSCO Properties, LLC). You can download a copy of the Agreed Order as well as the Fact Sheets on the website at: https://fortress.wa.gov/ecy/gsp/Sitepage.aspx?csid=599

2.2 Lena Kuliczkowska: Email Sent to Ecology Site Manager Jerome Cruz dated Friday, April 29, 2011 11:12 AM

Hi Jerome,

A new SeaTac development, called Master Park Lot C Expansion, is located west from the existing Master Park on International Blvd and S 160th St. (except Mr. Loudon property). The area for the proposed Surface Parking is in lease, and is part of Washington Memorial Cemetery.

Could you please give us more information how the Cleanup Program ID# 5994 will affect the design and construction of the new parking area?

Thank you,

Lena

Lena Kuliczkowska
Senior Engineering Technician
City of SeaTac
Engineering Division

206.973.4737

Ecology's Response: Ecology responded by email to Ms. Kuliczkowska on April 29, 2011. Ecology provided a page from the Draft Cleanup Action Plan showing the map of the proposed air sparging and soil vapor extraction (SVE) wells. Ecology noted that they are within the original property boundaries of MasterPark Lot C, so it was Ecology's opinion that it should not affect the construction activities for the Expansion. Golder Associates, the technical consultants for the potentially liable parties, was cc'd on the message so that they could confirm or follow up to the question.

Ecology noted that it looks like the groundwater plume is beneath the Lot C expansion, and there are monitoring wells (MW-17 and MW-16) located there, so Ecology was sure that Golder Associates will request that these wells not be destroyed. The cleanup will remediate the plume source and the plume.

Ecology indicated that it is not sure when the new construction will start, but suggested that all parties should probably communicate more so each will be aware of their respective construction schedules, especially when work starts at the western property boundary of Lot

C. This area will probably require some construction coordination and information exchange.

2.3 Ronny Seldal: Letter to Ecology Site Manager Jerome Cruz dated May 3, 2011

(Excerpts from Mr. Seldal's letter follow)

"My comment has to do with a business just across the street, less than ½ block away from the site you are asking for comments about.

Address Carlos Paint Shop-Formerly: M and M Finishing 16600 International Blvd, SeaTac, WA 98188."

"So to sum up, this property at 16600 International Blvd is hazardous property to the public both in the Air quality and in the ground soil from blocks around so my comment would be: Is there some way of get with the property owner and see what it would take to cleanup the hazardous soil and maybe work with him to find funding for this cleanup."

Ecology's Response: On May 5, 2011, Site Manager Jerome Cruz left a voicemail to Mr. Seldal thanking him for his interest in the site and stating that his letter was referred to Donna Musa, who coordinates the Initial Investigations/Site Hazard Assessment Team in Ecology's Toxics Cleanup Program. The property referred to in Mr. Seldal's letter is not part of the SeaTac Development site. However, by referring it to Initial Investigations and Site Hazard Assessment, the property can be evaluated to see if there is contamination that will require listing in Ecology's Confirmed and Suspected Contaminated Sites List, following regulatory process under the Model Toxics Control Act (MTCA).

2.4 Don Robbins with Port of Seattle: Letter to Ecology Site Manager Jerome Cruz dated May 27, 2011; Email dated Wednesday, October 5, 2011 3:34 PM

Comments by the Port may be found in their entirety in **Appendix A.4** of this Responsiveness Summary.

Golder Associates, the technical consultant for the SeaTac Development PLP Group, prepared an Addendum to the SeaTac Development Site RI/FS and Draft CAP in response to the Port of Seattle comments from May 27, 2011. Ecology reviewed the Addendum and approved its contents for incorporation in the RI/FS Report and Draft Cleanup Plan. The Addendum is included as **Appendix B** of this Responsiveness Summary and has been updated to address the Port's October 5, 2011 comments.

Ecology's response to the Port's October 5, 2011 email follows.

Don Robbins with Port of Seattle: Email dated Wednesday, October 5, 2010 3:34 PM

Jerome,

Thank you for the opportunity to comment on the September 15, 2011, Addendum to the Sea-Tac Development Site RI/FS and DCAP. A spreadsheet with detailed comments is attached, but our primary concerns are as follows:

Vapor Intrusion Analysis

The vapor intrusion analysis is still inadequate to determine whether future users of Port property will be protected from health risks. First, the text on soil vapor issues addressed only buildings north of South 160th Street. The Addendum also needs to address soil vapor issues for usage of the Port's property located south of South 160th Street. Second, the analysis looked only at commercial use. While the Port's property is currently used for parking, the future use is not known at this time and could well involve residential uses. Therefore we think the analysis should be based on unrestricted usage.

As you know, in June we met with you and SeaTac Development to discuss this concern (among other things). At that time, the Port was advocating that additional sampling be conducted on the parking lot property. Instead of installation of an additional well, we agreed to accept that the level of contaminant concentrations depicted on isoconcentration maps created for the remedial investigation is a reasonable approximation of what sampling would establish. We would like to point out that these maps show concentrations of benzene in groundwater greater than 20 ug/liter at this location. This significantly exceeds the Method B groundwater screening level of 2.4 ug/liter for benzene contained in table B-1 of Ecology's Draft Vapor Intrusion Guidance. In addition, soil vapor measurements near the Cemetery residence exceeded the Method B soil gas, sub-slab screening level of 3.2 ug/liter for benzene. A further evaluation of the vapor intrusion pathway must be completed for that area of the benzene plume beneath Port property using unrestricted land use screening criteria.

Sufficiency of Delineation

The Addendum concludes that the plume has been sufficiently delineated. Given increases in TPH-G and benzene at MW-22 during the last two sampling rounds, the Port believes a "wait and see" position is more appropriate. The Addendum should include a thorough review of the plume stability after a year of quarterly data has been acquired. At that time, if concentrations of TPH-G and/or benzene show an upward trend in nearby wells, then MW-A should be re-sampled. We believe providing for this contingency is a more protective approach to the potential risks.

Thanks again for the opportunity to comment, please give me a call if you have any questions,

Don Robbins
Port of Seattle
Aviation/Environmental
(206) 787-4918
robbins.d@portseattle.org

Contents of Attached File "Copy of Addendum_Comments_093011 (3).xlsx"

Port of Seattle Comments 9/30/11 on:

Golder Associates, Inc., 2011, Technical memorandum, Addendum to SeaTac Development Site RI/FS and Draft CAP, September 15, 2011.

Table Items	Page	Item	Comment
ITEM 1	2	1	Statement is in error. The Port has provided an aerial photograph that is shown in Addendum figures.
ITEM 2	2	2	Please specify the vertical datum.
ITEM 3	2	3, 4, & Figure 1	Till was logged in wells MW-4, Port MW-1, and Port MW-2 and should be shown on the figure.
ITEM 4	3, §3	5	The Addendum should state that the next round of water level measurements will include MW-A and MW-B in the groundwater flow path analysis. Port will provide survey data when available.
ITEM 5	3, §6	5	When is sampling scheduled to begin under the Compliance Monitoring Plan? Was March 2010 the most recent sampling event?
ITEM 6	4	6	Short-term increases in TPH-G and benzene values were reported at MW-22. The Port believes collection of additional groundwater monitoring data is necessary to determine whether contaminant concentrations are stable or declining in wells closest to Port property, especially near MW-B. A contingent task should be added to the addendum to increase the scope of sampling to include MW-A if nearby wells begin to show an upward trend.
ITEM 7	6	14	The Port understood at our June 2011 meeting that all data would be presented graphically as an aid to interpretation and results of all sampling events would be included. Also, TPH-G concentration above MTCA in March 2010 indicates that MW-19 should be included in the plots.

ITEM 8	7, 8, 9, & 12	Soil Vapor 1, 2, 3, & 4; Section 3.0 2nd bullet	The potential for vapor intrusion must be evaluated for the least restrictive property uses on the Port owned parking lot property south of South 160th Street. The RI/FS has only evaluated this pathway using a "commercial building" scenario.
ITEM 9	11	25, 26	The Port will review and comment on the Engineering Design Report and the Compliance Monitoring Plan data and conclusions.
ITEM 10	12	Section 3.0, 1st bullet	MW-B is on the South 160th Street right-of-way.
ITEM 11		Table B-1	Groundwater MTCA A table value should be 800 ug/L since benzene was detected in MW-B.
ITEM 12		Figure 4	What criteria were used to define the plume boundary, particularly near MW-B and MW-A? MW-19 should be included within the plume boundary, given the TPH-G increase to 1300 ug/L in 3/10, the most recent data available.

Ecology's Response:

General: Further input from the Port has been very productive and has included the installation of two additional wells as well as additional ground water quality information independently obtained by the Port at areas north and northwest of the site before or during the Port's redevelopment of its adjoining property (see attached Addendum in Section 3).

The Port conducted two investigations of groundwater during the mid to late 2000s. A 2004 groundwater investigation, in which three wells were installed, was conducted on Port property near the intersection of International Boulevard and S. 160th Street (northwest quadrant of intersection). Petroleum hydrocarbons were not detected in groundwater samples from these three wells that were subsequently decommissioned. The Port also conducted a baseline groundwater study, in which five borings were extended to the groundwater table and grab samples were obtained from temporary wells. The Port provided Ecology the results of its ground water grab samples obtained in September and October 2008 from temporary wells it installed on its property north and northwest of the Site plume. Results also showed nondetects for petroleum hydrocarbon compounds.

Two additional wells (Port MW-A and Port MW-B) were installed and sampled by the Port and the PLPs in August 2011. Port well MW-A, located north of the site and on Port property, yielded nondetects for any contaminants of concern that could be associated with the SeaTac Development site plume. Port well MW-B, located northwest of the site on South 160th Street right-of-way, detected gasoline and diesel and several gasoline petroleum compounds below MTCA cleanup Levels.

Ecology concludes that these preliminary results indicate the plume is not extensively on Port property and that the northwest sector of the plume may be beginning to migrate toward Port property in the vicinity just north of S. 160th Street. However, based on nearby concentrations in wells MW-22 and MW-17, the west edge of the plume above MTCA Cleanup Levels is expected to be below the Port's parking lot property west of the MasterPark parking lot and South of S. 160th Street. As pointed out by the Port, benzene concentrations may be expected to be in the order of 20 μg/L or greater in ground water in this area.

With the operation of the Soil Vapor Extraction and Air Sparging remedial alternative, concentrations in this area are expected to drop much lower than what preliminary ground water results are showing, decreasing the size of the plume and removing or mitigating the risks associated with the ground water plume, including vapor intrusion risks (please see our response below to Table Item 8). The DCAP and Compliance Monitoring Plan (CMP) provide an adequate monitoring network and schedule to monitor the plume's behavior, assess system performance, and natural attenuation processes. It will include the new well at the northwest, MW-B. The DCAP contains contingencies to install additional wells, assess corrective actions, and modify monitoring regimes if the plume for some reason is larger or if well concentrations increase.

Ecology believes that the preferred cleanup alternative should be implemented without any further delay in order to will reduce the site COCs, prevent further migration of the plume onto Port property, and remediate COCs to protect human health and the environment following MTCA requirements. Ecology does not foresee substantial gaps in characterization of the plume extent and risks once remediation is underway. Source and plume treatment is expected to reduce the footprint of the existing petroleum hydrocarbon contamination, especially the more volatile compounds like benzene, to the point that it no longer impacts adjoining properties, including the Port's.

Specific Responses to Table Items

ITEM 1 - Page 2, Item 1: Statement is in error. The Port has provided an aerial photograph that is shown in Addendum figures.

Ecology's Response: Ecology agrees. Due to incorporation of new Port structures in Addendum figures, the original comment has been addressed.

ITEM 2 - Page 2, Item 2: Please specify the vertical datum.

Ecology's Response: The vertical datum is the City of SeaTac, NAVD 88.

ITEM 3 - Page 2, Items 3, 4, & Figure 1: Till was logged in wells MW-4, Port_MW-1, and Port_MW-2 and should be shown on the figure.

Ecology's Response: Golder did not log the Port MW-1, Port MW-2 or Port MW-3 boreholes and will not extend their interpretation of the till on Port's property. The MasterPark well MW-4 borehole/well has been entered on the figure in the Addendum that is provided in Section 3.

ITEM 4 - Page 3, §3, Item 5: The Addendum should state that the next round of water level measurements will include MW-A and MW-B in the groundwater flow path analysis. Port will provide survey data when available.

Ecology's Response: Agreed. Port MW-B will be incorporated in the compliance monitoring plan. Port MW-A will not be included due to nondetects in this well and in previous ground water investigations in this area north of the site. Groundwater from Port MW-A well may be sampled after the remediation system is turned off for confirmation.

ITEM 5 - Page 3, §6, Item 5: When is sampling scheduled to begin under the Compliance Monitoring Plan? Was March 2010 the most recent sampling event?

Ecology's Response: Yes, March 2010 was the last time the MasterPark well network was sampled. Compliance monitoring will begin once the remedial system is installed and becomes operational. We have no interim groundwater monitoring plan right now.

ITEM 6 - Page 4, Item 6: Short-term increases in TPH-G and benzene values were reported at MW-22. The Port believes collection of additional groundwater monitoring data is necessary to determine whether contaminant concentrations are stable or declining in wells closest to Port property, especially near MW-B. A contingent task should be added to the addendum to increase the scope of sampling to include MW-A if nearby wells begin to show an upward trend.

Ecology's Response: The DCAP and CMP, through the Addendum, already incorporates compliance monitoring and trends determination using Monitored Natural Attenuation protocols, for groundwater from the Port MW-B well. Groundwater from Port MW-A well may be sampled after the remediation system is turned off for confirmation.

ITEM 7 - Page 6, Item 14: The Port understood at our June 2011 meeting that all data would be presented graphically as an aid to interpretation and results of all sampling events would be included. Also, TPH-G concentration above MTCA in March 2010 indicates that MW-19 should be included in the plots.

Ecology's Response: The Addendum appends a table with more data and details why all data could not be presented as a time series. The Tables in the RI/FS Report contain all the analytical data for groundwater in well MW-19 that could be plotted by anybody for aiding interpretation. Golder Associates will make a time series plot of MW-19 for TPH-Gasoline and send the plot directly to the Port.

ITEM 8 - Pages 7, 8, 9, & 12, Soil Vapor 1, 2, 3, & 4; Section 3.0 2nd bullet: The potential for vapor intrusion must be evaluated for the least restrictive property uses on the Port owned parking lot property south of South 160th Street. The RI/FS has only evaluated this pathway using a "commercial building" scenario.

Ecology's Response: The Port-owned property south of South 160th Street and adjacent west of the site is paved and zoned AVO (Aviation Operations). At the time of the RI/FS, it was undeveloped property and was completed as a parking lot in 2010. Currently, there is only a taxi dispatcher office building on the parcel that conservatively represents commercial land use. The Port property is presently not being used for residential land use, nor has the Port indicated that it has plans to develop the parcel for residential use in the near future within their Comprehensive Plan for the Airport area.

As part of the RI/FS, a (second) soil vapor investigation was conducted in 2009 at a residential building (Cemetery house) on the Washington Memorial Park Cemetery property. At that time the building was located immediately east of the newly constructed Port parking lot and closer to the center of the petroleum hydrocarbon plume. The potential for vapor intrusion was assessed due to a

concern that benzene or other petroleum-related VOCs might be volatilizing from the water table,[1] contaminating soil gas, and leading to unacceptable indoor air impacts.

Benzene was the only COC detected in the 2009 soil vapor samples which exceeded conservative soil vapor screening levels. The maximum concentration detected (16 $\mu g/m^3$) was less than the industrial (equivalent commercial) screening levels, but was about five times higher than the $1X10^{-6}$ unrestricted-use screening level (3.2 $\mu g/m^3$). Benzene levels in crawlspace air samples were no higher than ambient air concentrations. Based on these findings Ecology determined that the cemetery house did not require mitigation.

The cemetery house has subsequently been torn down and there are no buildings located in the nearby area. So there is no current vapor intrusion exposure pathway for this part of the site. It is true, though, that this could change in the future. If buildings were constructed in the area before the cleanup action had successfully reduced benzene concentrations at the water table to cleanup levels, it is possible that vapor intrusion could potentially threaten indoor air quality inside those new residential buildings. Should residential building construction occur, the PLPs will be responsible *at that time* for further assessing vapor intrusion to determine the potential for unacceptable indoor impacts.

The 2.4 μg/L Method B benzene groundwater screening level in Table B-1 of Ecology's Draft Vapor Intrusion Guidance (Publication No. 09-09-047 October 2009) is not a site-specific value. Nor is it intended for use as a Cleanup Level. It is a value that essentially determines whether vapor intrusion should or should not be further assessed. Since MasterPark groundwater levels of benzene exceeded this value, follow-up vapor intrusion assessment (primarily soil gas sampling) was performed during the RI. The assessment determined that even though groundwater concentrations of benzene significantly exceeded the Guidance screening level,[2] soil gas at 10 feet was only marginally above conservative screening levels, and crawlspace air was no more contaminated than ambient air. The groundwater benzene concentration protective of residential indoor air (via vapor intrusion), therefore, is likely to be considerably higher than 2.4 μg/l at the MasterPark site.

Reduced benzene concentrations at the saturated zone source and attenuation and biodegradation through 66 feet of vadose zone should, over time, reduce soil vapor concentrations considerably at the site. The Port property is located downgradient of the locations where soil gas samples were collected in 2009. It is over a part of the plume with benzene concentrations expected to be lower

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[1] The water table is at a depth of over 66 feet below ground in this area (MW-16).

[2] Dissolved ground water benzene in MW-16 (nearest to the building) ranged from 51 μg/L to 160 μg/L, 20 to 60 times the Method B benzene groundwater screening level for vapor intrusion.

than those in the area where vapor intrusion measurements were taken during the RI/FS. The presence of the asphalt parking lot cap, and application of the SVE and Air sparging system should reduce ground water contaminant levels to a point where soil vapor risks are virtually eliminated at the Port's parking lot.[3]

The Port has noted that "While the Port's property is currently used for parking, the future use is not known at this time and could well involve residential uses. Therefore we think the analysis should be based on unrestricted usage. A further evaluation of the vapor intrusion pathway must be completed for that area of the benzene plume beneath Port property using unrestricted land use screening criteria."

Ecology agrees; it is possible that the property could be further developed, buildings could be constructed, and some or all of the buildings could be used for residential purposes. But based on Ecology's assessment of the 2009 sampling results near the cemetery building, it does not appear likely that vapor intrusion would need to be mitigated in any newly constructed building. The likelihood should become more remote with time, as the cleanup action reduces groundwater and soil gas benzene levels. Nevertheless, if the Port decides to construct residential buildings and convert the parking lot property to residential use before the preferred remedial alternative has achieved vapor intrusion-related remedial objectives, the PLPs will be responsible for further assessing the vapor intrusion threat associated with the new residential structures.

ITEM 9 - Page 11, Item 25, 26: The Port will review and comment on the Engineering Design Report and the Compliance Monitoring Plan data and conclusions.

Ecology's Response: Ecology agrees.

ITEM 10 - Page 12, Item Section 3.0, 1st bullet: MW-B is on the South 160th Street right-of-way.

Ecology's Response: Sentence will be revised.

ITEM 11 - Table B-1: Groundwater MTCA A table value should be 800 ug/L since benzene was detected in MW-B.

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[3] The MTCA Method A ground water cleanup level for benzene at the site is 5 μg/L. This is only twice the vapor intrusion Guidance's Method B ground water screening level of 2.4 μg/L for unrestricted land use, which, as noted above, appears to be overly conservative for this site.

Ecology's Response: Ecology agrees. Entry in Table B-1 will be revised to show a MTCA Method A value of 800 μg/L for TPH-Gx.

ITEM 12 - Figure 4: What criteria were used to define the plume boundary, particularly near MW-B and MW-A? MW-19 should be included within the plume boundary, given the TPH-G increase to 1300 ug/L in 3/10, the most recent data available.

Ecology's Response: The plume boundary in Figure 4 is estimated based on hydrogeologic and geochemical principles using the applicable MTCA Method A ground water cleanup level for dissolved gasoline (TPH-Gx) and petroleum related compounds. The Addendum will be revised to use the March 2010 plume footprint for TPH-Gx (Figure 4-6 in the RI/FS Report) for Figure 4. This will include MW-19 in the plume boundary.

APPENDIX A. ORIGINAL COMMENTS

(NEXT PAGE)

APPENDIX A. ORIGINAL COMMENTS

A.1 Rachelle Goda: Email Sent to Ecology Site Manager Jerome Cruz on Friday, April 22, 2011 7:21 PM:

-----Original Message-----
From: rachellegoda@yahoo.com [mailto:rachellegoda@yahoo.com]
Sent: Friday, April 22, 2011 7:21 PM
To: Cruz, Jerome (ECY)
Subject: SeaTac Development Site

Hi,
Thank you for sending out information about SeaTac Development site. I just have a few question?
-How far from the site area are contaminated?
-How was it determined that no drinking source is contaminated?
-What health risks are there now, because of the contamination?
-Who will oversee and manage the cleanup process from the contaminated site?
-What are the risk for any residents nearby when the cleanup process occur?
-How was it known that the area was contaminated?

Thank you for your time and answering these questions?

Rachelle Goda

-----Original Message-----
From: rachellegoda@yahoo.com [mailto:rachellegoda@yahoo.com]
Sent: Tuesday, April 26, 2011 8:27 AM
To: Cruz, Jerome (ECY)
Subject: Re: SeaTac Development Site

Thank you! I hope your having a good day. I would like to add a few more questions.
-How is the clean-up being funded?
-Are there enough funding to clean-up the contamination?
-What is the role of SeaTac Investment LLC, ANSCO Properties LLC, and other businesses that caused the contamination in regarding to funding and clean-up?
-Are those businesses listed above involve in clean-up and funding?

Thank you again for your time,

Rachelle Goda

On Apr 25, 2011, at 8:13 AM, "Cruz, Jerome (ECY)" <JCRU461@ECY.WA.GOV> wrote:

Good morning Ms. Goda,
I will get back to you to answer your questions about the SeaTac Development site.
Thank you,
Jerome

Jerome B. Cruz, Ph.D.
Toxics Cleanup Program, Northwest Regional Office
3190 - 160th SE Bellevue, WA 98008
Tel: (425) 649-7094 Fax: (425) 649-7098
Jerome.Cruz@ecy.wa.gov
http://www.ecy.wa.gov/programs/tcp/cleanup.html
-----Original Message-----
From: rachellegoda@yahoo.com [mailto:rachellegoda@yahoo.com]
Sent: Tuesday, April 26, 2011 4:35 PM
To: Cruz, Jerome (ECY)
Subject: Re: SeaTac Development Site
Thank you for your reply and answer.
Rachelle Goda

On Apr 26, 2011, at 8:44 AM, "Cruz, Jerome (ECY)" <JCRU461@ECY.WA.GOV> wrote:

Good morning Rachelle,
To save me some time, I will answer your latest questions.

-How is the clean-up being funded?
ANSWER:
It is being paid for by the Potentially Liable Parties or PLPs (Sea-Tac Investments LLC, Scarsella Bros. Inc., and ANSCO Properties, LLC).

-Are there enough funding to clean-up the contamination?
ANSWER:
It is the PLPs responsibility to ensure they have sufficient funding under Model Toxics Control Act administrative orders. To actually carry out the cleanup, we will see what mechanism will be used to execute the cleanup, such as a consent decree or agreed order. For the present agreed order, the PLPs has been funding the investigations that produced the RI/FS report and DCAP.

-What is the role of SeaTac Investment LLC, ANSCO Properties LLC, and other businesses that caused the contamination in regarding to funding and clean-up?
ANSWER:
They are the PLPs and are under an Agreed Order to complete an RI/FS and DCAP. An Agreed Order is a legal document that formalizes the agreement between the PLPs and Ecology for actions needed at the site.

-Are those businesses listed above involve in clean-up and funding?
ANSWER:
Yes (see answer to first question for complete list).

You can download a copy of the Agreed Order as well as Fact sheets on the site at:
http://www.ecy.wa.gov/programs/tcp/sites/seaTacDev/seaTacDev_hp.html

I hope to get back to you with the answers to questions from your first email soon.

Thanks,
Jerome

Jerome B. Cruz, Ph.D.
Toxics Cleanup Program, Northwest Regional Office
3190 - 160th SE Bellevue, WA 98008

Tel: (425) 649-7094 Fax: (425) 649-7098
Jerome.Cruz@ecy.wa.gov
http://www.ecy.wa.gov/programs/tcp/cleanup.html

-----Original Message-----
From: rachellegoda@yahoo.com [mailto:rachellegoda@yahoo.com]
Sent: Tuesday, May 17, 2011 8:15 AM
To: Cruz, Jerome (ECY)
Cc: <DMorell@golder.com>; Longley, Kirsi; Lui, Nancy (ECY)
Subject: Re: SeaTac Development Site

Hello Mr. Cruz,
I hope you are enjoying this day. I am appreciative of your time and researching to answer the questions. Please keep me posted of any new information. Thank you again and continue doing and excellent job of overseeing this project. Have a wonderful day.
Rachelle Goda

On May 16, 2011, at 10:29 AM, "Cruz, Jerome (ECY)" <JCRU461@ECY.WA.GOV> wrote:
Hello, Ms. Goda,
I apologize for the delay in getting back to you on your first set of questions. Here are the answers to your questions. Please feel free to contact me again if I can explain further.
Jerome

QUESTION
-How far from the site area are contaminated?
ANSWER
Past investigations revealed that soil contamination is within the property boundary. The area of contaminated groundwater is wider, extending north past south 160th Street, and also west onto the adjoining property to the MasterPark Facility. However, groundwater is at least 50 feet deep beneath the site. The attached maps should help with the more detailed description provided below.

For soil, a source of gasoline impacted soils exists within the MasterPark Facility near the location of the former gasoline USTs at the northwest corner of the property. Relative concentrations of gasoline (and BTEX) in the source area are highest at depths between 10 feet and 40 feet below ground surface and decrease in concentration as you go deeper. It is limited to a zone with an area of approximately 50 to 60 foot diameter. There are some smaller limited spots of petroleum

hydrocarbon impacted soil beneath the asphalt parking lot in the Masterpark Facility.

The property which is further north of the MasterPark property may contain its own subsurface contamination source. However, the property owner has not agreed to accessing their property and so the approach adopted will be to observe the groundwater concentrations in nearby wells while groundwater cleanup at the MasterPark Facility is carried out to see if it will indicate a source at this nearby property that impacts groundwater.

Ground water is a key medium of contamination at the site. Groundwater is between 45 and 115 feet below land surface. Groundwater analytical results confirm that the source of impact is bounded by MW-12 to the north, MW-14 to the south, MW-18 to the east, and MW-13 to the west. This is demonstrated by gasoline isoconcentration contour maps that were developed for the 2007-2008 (Figure 4-3) and May 2009 (Figure 4-4) groundwater sampling events, attached as a file to this message. These figures show that the highest concentrations of gasoline were detected in MW-12, MW-13, MW-14, and MW-18. With distance from these wells, the concentration of gasoline in groundwater steadily decreases.

The plume is roughly 640 feet across.

The plume is well delineated, except for the area to the northwest where heavy construction by the Port of Seattle north of South 160th Street has prevented further investigation. The groundwater gasoline plume is estimated to have migrated about 140 feet beyond MW-22, which is depicted in Figure 4-6. The gasoline plume will eventually be further delineated northwest of MW-22 through the installation of an additional well(s).

QUESTION
-How was it determined that no drinking source is contaminated?
ANSWER
There are no potable groundwater supply wells within a mile of the Site in the general downgradient direction (west, southwest or northwest) from the Site. The closest groundwater supply well is in the Washington Memorial Park Cemetery, south of the Site, and is used for watering. However, this cemetery well has not been impacted by Site releases (as per results from Ecology's 2006 and Golder's 2001 sampling events). Therefore, there are no current groundwater exposure pathways to off-Site humans from drinking water impacted by Site release.

There is no known discharge of Site groundwater to surface water in the area, including the potential
wetland area and man-made pond on the cemetery property south of the Site.

Ground water samples collected from monitoring wells surrounding the site show no petroleum hydrocarbon compounds above cleanup levels in the water. This helped establish the limits of most of the plume in relationship to the nearest potable groundwater supply well, which is over a mile away.

QUESTION
-What health risks are there now, because of the contamination?
ANSWER
Future MasterPark Facility construction/remediation workers could become exposed by direct contact and
incidental ingestion to Site near-surface soils (<15 feet) during construction excavation or impacted soil
removal activities in the vicinity of the source area (former gasoline USTs at the MasterPark Facility).

There is a potential risk from vapor intrusion, however, based on some soil gas studies conducted, there is little if any risk because the levels are very low, as low or lower than air borne levels measured from nearby street traffic (ambient air).

QUESTION
-Who will oversee and manage the cleanup process from the contaminated site?
ANSWER
The Department of Ecology and the Potentially Liable parties are presently under an Agreed Order to conduct an remedial investigation and feasibility study. Ecology is the state lead that ensures that the cleanup process follows the Model Toxics Control Act (MTCA). Technical work is paid for by the PLPs.

QUESTION
-What are the risk for any residents nearby when the cleanup process occur?
ANSWER
There should be little if any risk when the preferred remedial alternative is carried out to clean up the groundwater contamination. The air sparging system and soil vapor extraction systems will be on the property and off limits to the public. There is a Health and Safety, a

Performance and Compliance Monitoring Plan, and a Confirmational Monitoring Plan to ensure the systems are implemented safely and that the remediation is effective and protective. Groundwater and air will be monitored during and after the operations to ensure the systems are performing and that existing hazards to people at the site are minimized.

QUESTION
-How was it known that the area was contaminated?
ANSWER
In 2000 during development of the property, Sea-Tac Investments found petroleum contamination in soil and groundwater. High levels of gasoline were found in the groundwater aquifer 50-60 ft. beneath the property. Contamination seemed to be from equipment operations and old underground storage tanks used by the former owner or former tenants. In 2001 Sea-Tac Investments entered into Ecology's Voluntary Cleanup Program to investigate and clean up some of the contamination. Ecology gave Sea-Tac Investments a "No Further Action" letter for cleanup of the soil. The gasoline contamination in the aquifer extends beyond property boundaries and was not cleaned up at that time.

There were later investigations to find the source of contamination in the aquifer. A series of investigations and remedial actions were conducted starting in September 2000 with a Phase I Environmental Site Assessment (ESA) followed by Phase II ESA investigations and culminating in September 2001 with an independent remedial action (IRA) conducted in coordination with property development. Ecology performed groundwater sampling at the Site in 2006, and remedial Site investigations resumed in 2007. The activities and results of these investigations are reported in the RI/FS report that is available to the public for review and comment.

Jerome B. Cruz, Ph.D.
Toxics Cleanup Program, Northwest Regional Office
3190 - 160th SE Bellevue, WA 98008
Tel: (425) 649-7094 Fax: (425) 649-7098
Jerome.Cruz@ecy.wa.gov
http://www.ecy.wa.gov/programs/tcp/cleanup.html

-----Original Message-----
From: rachellegoda@yahoo.com [mailto:rachellegoda@yahoo.com]
Sent: Friday, April 22, 2011 7:21 PM
To: Cruz, Jerome (ECY)
Subject: SeaTac Development Site

Hi,
Thank you for sending out information about SeaTac Development site. I just have a few question?
-How far from the site area are contaminated?
-How was it determined that no drinking source is contaminated?
-What health risks are there now, because of the contamination?
-Who will oversee and manage the cleanup process from the contaminated site?
-What are the risk for any residents nearby when the cleanup process occur?
-How was it known that the area was contaminated?

Thank you for your time and answering these questions?

Rachelle Goda
<SeaTacDevt RI-FS Final Report Fig4-3.jpg>
<SeaTacDevt RI-FS Final Report Fig4-4.jpg>
<SeaTacDevt RI-FS Final Report Figs4-6.jpg>

A.2 Lena Kuliczkowska: Email Sent to Ecology Site Manager Jerome Cruz dated Friday, April 29, 2011 11:12 AM

-----Original Message-----

From: Lena Kuliczkowska [mailto:lkuliczkowska@ci.seatac.wa.us]
Sent: Friday, April 29, 2011 11:12 AM
To: Cruz, Jerome (ECY)
Subject: new development project v cleanup

Hi Jerome,

A new SeaTac development, called Master Park Lot C Expansion, is located west from the existing Master Park on International Blvd and S 160th St. (except Mr. Loudon property). The area for the proposed Surface Parking is in lease, and is part of Washington Memorial Cemetery.

Could you please give us more information how the Cleanup Program ID# 5994 will affect the design and construction of the new parking area?

Thank you,

Lena

Lena Kuliczkowska
Senior Engineering Technician
City of SeaTac
Engineering Division
206.973.4737

A.3 Ronny Seldal: Letter to Ecology Site Manager Jerome Cruz dated May 3, 2011:

Facility Site ID #: 3825 8847
Cleanup ID #: 5994

Page: 1 of 3

5/3/2011

From: Ronny SELDAL
3115 So. 166th St.
SeaTac, WA 98188
Ph. 206-431-1041

RECEIVED
MAY 04 2011
DEPT OF ECOLOGY
TCP-NWRO

My Comment has to do with a business just across the street, less than ½ block away from the site you are asking for comments about. Address below.

Address: "Carlos' Paint Shop" – Formerly: "M and M Finishing"
16600 International BLVD
SeaTac, WA 98188

The owner of the propety has been trying to sell it for the last two – three years because he was being visited by Enviromental Health Investigators from Hazardous Waste Management Program for Exhausting Hazardous Fumes into the neighborhood just East of the business at 16600 International BLvd.

Now, the owner is renting to a Paint Shop which is venting Fumes into the neighborhood. There has been a Ramada Hotel and a Bank of America built very close to this paint Shop, Which as you know had to move there to make room for the new Light Rail system. I did a little research and come to find out the old business, M+M Finishing, was told they had to upgrade their paint fume exhaust System, which included a 30 foot high vent that would vent the fumes 30 feet above the

roof of the buildng. But, because of the restrictions in this area the city would not issue a permit to allow such a structure. ALso, the cost of upgrading the Finishing companies exhaust system inside the building was too much for the Owner of the Property and that's why he was trying to sell it. I also Learned that the ground under the building is Completely saturated with hazarous material and to remove it would cost over two times the Value of the property because of the new regulations reguarding soil with hazarous material. It's my understanding it goes very deep under the building.

As you know there is a well up on top the hill which helps supply the City of SeaTac with water. I have had a sink hole in my driveway that was about 3½ feet and about 4 or 5 inches around at the top that I filled in with gravel from my driveway. My neighbor drained his pool and a week later he asked me if I noticed any excess water in my yard and I said NO. My point is that this whole hill side has a lot of undergroun water and it be pushing all that hazarous materia under the building at 16600 International Blvd righ into your Site of concern for a long time, as wel as right now.

So, to sum up, this property at 16600 Int. Blvd is hazarous property to the Public both in the Air quality and in the ground soil for Blocks Around

So, my comment would be:

Is there some way of get with the property owner and see what it would take to clean up the hazarous soil and maybe work with him to find funding for this cleanup. If he is still selling it maybe the city can purchase it in order to get federal funding. The city could even purchase the property and put a road through it, 166th, right to International BLV. I'm just brain storming here; But if this property could be cleaned up some way it would make it safer for the public and the animals in the pond across the street in the Cemetery and of course your site for the parking lot just across and down from it.

P.S. I'm sorry about being hand written. I'm getting a laptop pretty soon so, please forgive me for the punctuation, spelling and sentence structure.

Sincerely,

Ramy Abdel

* P.P.S.S. There is already a sink hole starting in the middle of International BLVD. There is an arrow board directing traffic around it.

Transcribed Letter follows:

My comment has to do with a business just across the street, less than ½ block away from the site you are asking for comments about. Address below.

Address: Carlos Paint Shop-Formerly: M and M Finishing 16600 International Blvd, SeaTac, WA 98188.

The owner of the property has been trying to sell it for the last two-three years because he was being visited by Environmental Health Investigators from Hazardous Waste Management Program for exhausting hazardous fumes into the neighborhood just east of the business at 16600 International Blvd.

Now, the owner is renting to a Paint Shop which is venting fumes into the neighborhood. There has been a Ramada Hotel and a Bank of America built very close to this paint shop, which as you know had to move there to make room from the new Light Rail System. I did a little research and come to find out the old business, M&M Finishing, was told they had to upgrade their paint fumes exhaust system, which included a 30 foot high vent that would vent the fumes 30 feet above the roof of the building. But, because of the restrictions in this area the city would not issue a permit to allow such a structure. Also, the cost of upgrading the finishing companies exhaust system inside the building was too much for the owner of the Property and that's why he was trying to sell it. I also learned that the ground under the building is completely saturated with hazardous material and to remove it would cost over two times the value of the property because of the new regulations reguarding [sic] soil with hazardous material. It's my understanding it goes very deep under the building.

As you know there is a well up on the top the hill which helps supply the city of seatac with water. I have had a sink hole in my driveway that was about 3 ½ feet and about 4 or 5 inches around the top that I filled in with gravel from my driveway. My neighbor drained his pool and a week later he asked me if I noticed any excess water in my yard and I said No. My point is that this whole hill side has a lot of underground water and it be pushing all that hazardous material under the building at 16600 Int. BLvd right into your site of concern for a long time, as well as right now.

So, my comment would be:

Is there some way of get with the property owner and see what it would take to cleanup the hazardous soil and maybe work with him to find funding for this cleanup. If he is still selling it maybe the city can purchase it in order to get federal funding. The city could even purchase the property and put a road through it, 166th, right to International BLV. I'm just brain storming here; But if this property could be cleaned up some way it would make it safer for the public and the animals in the pond across the street in the cemetery and of course your site for the parking lot just across and down from it.

P.S. I'm sorry about being hand written. I'm getting a laptop pretty soon so, please forgive me for the punctuation, spelling and sentence structure.

*P.P.S.S. There is already a sink hole starting in the middle of International BLVD. There is an arrow board directing traffic around it.

A.4 Don Robbins with Port Of Seattle: Letter to Ecology Site Manager Jerome Cruz dated May 27, 2011

Port of Seattle

May 27, 2011

Jerome Cruz
Site Manager
Washington State Department of Ecology
Northwest Regional Office
3190 160th Ave SE Bellevue, WA 98008

Dear Mr. Cruz:

Thank you for the opportunity to provide comments on the SeaTac Development (MasterPark Lot C) site's Remedial Investigation/Feasibility Study (RI/FS) report, and Draft Cleanup Action Plan (DCAP). Attached you will find the Port of Seattle's technical comments on these documents.

As you know, the Port of Seattle owns the property directly to the north of the SeaTac Development site, and has provided SeaTac Development access to Port monitoring wells as part of its data collection activity for this RI/FS. Currently under construction on this property is a large consolidated rental car facility (CRCF) that is scheduled to open in early 2012. The major structural elements of that facility are already in place, as can be seen in the attached aerial photo.

The findings of the SeaTac RI strongly suggests that gasoline- and benzene-impacted groundwater have migrated from the SeaTac Development site to the adjacent Port of Seattle property at levels exceeding cleanup standards.

The Port has two overarching concerns about the RI/FS and DCAP:

- Lack of evaluation of the vapor intrusion pathway on Port property at the new CRCF,
- The proposed use of monitored natural attenuation (MNA) to address cleanup of the groundwater plume on Port of Seattle property in the absence of details on how this will be monitored and evaluated, particularly in light of the location of the new structure relative to otherwise logical monitoring locations.

The Port will work with the Department of Ecology and SeaTac Development to facilitate the increased level of monitoring required to demonstrate the effectiveness of MNA, and to assure that the PLP's evaluation the risk of vapor intrusion has no impact on buildings on Port property.

Port of Seattle

We request that Ecology and SeaTac Development maintain close communication and coordination with the Port to enable a timely site remediation consistent with the actual use of the Port's adjacent property. Such remediation should include elements that actively manage any existing groundwater contamination conditions on the Port's property, prevent any new or additional migration of groundwater contamination to the Port's property, and assess and as necessary the potential for vapor intrusion and human exposures at the Port's property.

With these specific requests in mind, the Port further requests the Ecology provide to the Port all draft and final documents associated with plans for and results of additional investigations needed to resolve data gaps identified in the attached comments, and development and implementation of the final DCAP.

Thank you again, we look forward to hearing from you on this matter.

Sincerely,

Donald A. Robbins
Senior Environmental Program Manager
Port of Seattle — Seattle-Tacoma International Airport

Documents Referenced

Golder Associates (RIFS), 2010, Remedial Investigation/Feasibility Study, Sea-Tac Development Site, Seatac, Washington, September 17, 2010.

Golder Associates (DCAP), 2011, Draft Cleanup Action Plan, Sea-Tac Development Site, Seatac, Washington, April 14, 2011.

Washington State Department of Ecology (Ecology), 2005, Guidance on Remediation of Petroleum-Contaminated Ground Water by Natural Attenuation, Toxics Cleanup Program, Publication No. 05-09-091 (Version 1.0), July 2005.

Washington State Department of Ecology (Ecology), 2009, Guidance for Evaluating Soil Vapor Intrusion in Washington State: Investigation and Remedial Action, Review DRAFT, Toxics Cleanup Program, Publication No. 09-09-047, October 2009.

Site Mapping

1. An outline of new Port RCF structures (Port property), north of South 160th Street, on figures would be useful to show current land use and adjacent site conditions.
2. Identification of survey datums (not specified in RIFS §3.4) would be helpful for comparisons with Port data.

Hydrogeology

3. Preparation of geologic cross sections is highly recommended for hydrogeologic evaluation and for review of conclusions and proposed remediation alternatives. No geologic cross sections were presented in the RIFS or DCAP.
4. The presence or absence of glacial till could affect contaminant migration and soil vapor pathways. Preliminary review indicates that the till unit appears to be discontinuous within the identified boundaries of the contaminant plumes[1]. A map of till thickness, and identification of any other confining units, would be very helpful for interpretations and evaluations.
5. About thirteen wells were used to define groundwater flow directions south of South 160th Street. However, there are no monitoring wells north of South 160th Street to define local flow directions on the Port property. Since the groundwater contours in this area are relatively flat (i.e. hydraulic gradients are small), there is no guarantee that flow directions on the Port property are the same as on the MasterPark site. Item 6, below, notes that there are logistical constraints in locating wells on the Port property.

[1] Absence of till is noted at MasterPark well MW-22 and Port borings (RCF baseline study) located about 90 feet north and 200 feet north-northwest of MasterPark well MW-16. Till has been interpreted on the site (e.g. MW-9, MW-1, and MW-7) and also on Port property (at the southeast corner and thence north along International Blvd).

Groundwater Monitoring

6. The Compliance Monitoring Plan (CMP) (Attachment E to DCAP) proposes only one new monitoring well on Port property; MW-X was positioned about 270 feet northwest of MW-22, which appears to fall within an RCF structure. Logistical constraints, due to access issues associated with the new Rental Car Facility, are not addressed for locating monitoring well(s) on or near the Port property.
7. Would one well be sufficient for defining plume boundaries and monitoring natural attenuation on Port property?
8. Well MW-23, located 130 feet east of MW-15, appears to have been removed from the monitoring well network (e.g. DCAP Figure 9 and Attachment E, Compliance Monitoring Plan §5.1). No monitoring well(s) is proposed to bound contaminant plumes on Port property north or east of MW-15. Should MW-23 be retained in the groundwater monitoring network?

Contaminant Plumes in the Regional Qva Aquifer

9. Gasoline and benzene plumes were estimated to be migrating to the northwest onto Port property (RIFS §4.4.2.1, pg 38). The methodology used (RIFS §4.4.2.1) assumed only an advective (bulk movement) process and further assumed a northwest groundwater flow direction. Contamination migration by diffusion and dispersion processes does not appear to have been addressed. The actual extent of gasoline and benzene plumes onto Port property has not been determined.
10. Have the groundwater contaminant plumes been demonstrated to be shrinking, stable, or growing? Gasoline concentration data at MW-22, for example, may indicate an expanding plume.
11. As noted in the RIFS, opportunities for monitoring wells are limited north of South 160th Street. One monitoring well was proposed on Port property, but see Item 6 related to logistical constraints.
12. As groundwater flow directions on Port property have not been determined (Item 5), the assumption of northwest flow from MW-22 requires further investigation.
13. Analysis of diffusion and dispersion effects on contaminant migration would improve estimates of the extent of contamination plumes onto Port property.
14. For interpretation, it would be helpful to extend the time scale of groundwater COC time series (trend) plots to cover all available historical data. The plots currently show data from August 2007 to March 2010, while it appears that the first regional groundwater monitoring wells were installed and sampled in 2001.
15. The extent of vertical migration of contaminants into the Qva aquifer should be more closely evaluated. Statements in the RIFS suggest no vertical migration has occurred (RIFS §4.4.2.1, pg 39 and §4.4.2.2, pg 40). However, deep well MW-10 was screened about 95 below ground surface (bgs), about 40 feet into the aquifer, and had initial detections of gasoline at 1,600 µg/L and benzene at 31 µg/L after well installation in 2001. The boring log indicated

petroleum odors and elevated PID readings to a depth of 60 feet below ground surface, or 15 feet into the aquifer saturated zone.

Soil Vapor Issues

16. Vapor intrusion screening levels were exceeded near South 160th Street for groundwater (above Method B and very close to Method C) and for shallow soil (above Method B but below Method C). Assessment of vapor intrusion exposure pathways for any new RCF structures may be appropriate.
17. The DCAP does not propose soil vapor monitoring or further vapor intrusion evaluation. The RIFS (§4.3.2) implies that a risk analysis for benzene using Method C, shallow soil, screening level (32 µg/L) found no risk to indoor commercial workers. The DCAP (§3.5.3) indicates that a vapor intrusion "Tier I preliminary assessment"[2] was performed with the conclusion that since "soil vapors are below shallow soil screening levels at the property boundary, there is no unacceptable risk from vapor intrusion into current commercial buildings to workers on the Site (but off of the MasterPark Facility)." The basis for stating that "soil vapors are below shallow soil screening levels" evidently refers to the benzene Method C, shallow soil, screening level of 32 µg/L. However, the benzene concentration in groundwater at MW-22 was 23 µg/L, which is very close to the MTCA C groundwater screening level of 24 µg/L. The elevated benzene concentration indicates that a vapor intrusion pathway from groundwater may need to be further evaluated under areas of the contaminant plume outside of the source area. Have off-site, potential vapor intrusion issues related to high benzene concentration in MW-22, observed during March 2010 sampling, been addressed?
18. The vapor intrusion risk analysis (RIFS §4.3.2) and "Tier I preliminary assessment" (DCAP §3.5.3) mentioned in the RIFS and DCAP, respectively, were not referenced and therefore not reviewed. Can these studies be provided for review? Did these studies evaluate the 2009 shallow soil vapor results near the Cemetery residence and the groundwater benzene concentrations in MW-22?
19. Vapor migration pathways, such as subsurface utility line (SUL) trenches, have not been considered.

Preferred Remediation Alternative

Monitored Natural Attenuation in Groundwater

20. The RIFS and DCAP propose monitored natural attenuation (MNA) of the contaminant plumes, outside the treatment area and including off-site properties. The MNA process requires multiple lines of evidence for reaching a determination that natural attenuation is

[2] This terminology is not clear. Ecology (2009, pg 3-1) states that the recommended vapor intrusion evaluation process consists of three steps: Preliminary Assessment, Tier I Assessment, and Tier II Assessment.

occurring, including (1) long-term decrease of contaminant concentrations, (2) assessment of geochemical parameters, and (3) microbial studies. Evaluation of monitored natural attenuation (MNA) was not addressed in the RIFS (§7.1.2, pg 55) and appears to be described only by reference to the Ecology (2005) guidance document in the DCAP (Attachment E, CMP §5.1.3). Please provide additional details on the proposed MNA assessment process.

22. The DCAP does not appear to have specified a feasible plan for groundwater monitoring north of South 160th Street.
23. The CMP lists contaminants and geochemical parameters (DCAP, Attachment E, CMP Table 1 footnotes) and sampling parameters (DCAP, Attachment E, CMP §6.2.2) for MNA. Redox (Eh) and dissolved oxygen (DO) are commonly measured sampling parameters that should be included.

Active Remediation

24. Does the proposed remediation Alternative A provide for effective capture of vapors generated by air sparging? The air sparging will occur at about 50 feet below ground surface and 10 to 20 below the till layer, where present. How will the combination of extraction wells and trenching work given these two features may be separated by a till layer? Can lateral migration of vapors occur such that vapors bypass the capture zone?
25. At what depth in the regional aquifer will the sparging wells be completed? See Item 15 above regarding vertical migration of contaminants deeper into the water table.
26. What depths are proposed for the extraction wells and trenching?
27. Does the proposed plan adequately provide for monitored natural attenuation of off-site plumes, especially for the Port property north of South 160th Street? See related comments above under *Groundwater Monitoring* and *Contaminant Plumes in the Regional Qva Aquifer*.
28. In the discussion of remediation alternatives, it would be helpful if scores, weighting values, and alternatives B1 and B2 were included in the RIFS §8 subsections. The list in RIFS §8.3.4 appears to have Alternatives B and E reversed.
29. A pre-design evaluation does not appear to have been performed to estimate radius of influence of the sparging or extraction wells. A radius of influence for air injection wells was assumed to be 25 feet (50-foot well separation).

Don Robbins with Port of Seattle: Email dated Wednesday, October 5, 2010 3:34 PM

From: Robbins, Don [mailto:Robbins.D@portseattle.org]
Sent: Wednesday, October 05, 2011 3:34 PM
To: Cruz, Jerome (ECY)
Subject: SeaTac Development RI/FS Addendum Comments

Jerome,

Thank you for the opportunity to comment on the September 15, 2011, Addendum to the Sea-Tac Development Site RI/FS and DCAP. A spreadsheet with detailed comments is attached, but our primary concerns are as follows:

Vapor Intrusion Analysis

The vapor intrusion analysis is still inadequate to determine whether future users of Port property will be protected from health risks. First, the text on soil vapor issues addressed only buildings north of South 160th Street. The Addendum also needs to address soil vapor issues for usage of the Port's property located south of South 160th Street. Second, the analysis looked only at commercial use. While the Port's property is currently used for parking, the future use is not known at this time and could well involve residential uses. Therefore we think the analysis should be based on unrestricted usage.

As you know, in June we met with you and SeaTac Development to discuss this concern (among other things). At that time, the Port was advocating that additional sampling be conducted on the parking lot property. Instead of installation of an additional well, we agreed to accept that the level of contaminant concentrations depicted on isoconcentration maps created for the remedial investigation is a reasonable approximation of what sampling would establish. We would like to point out that these maps show concentrations of benzene in groundwater greater than 20 ug/liter at this location. This significantly exceeds the Method B groundwater screening level of 2.4 ug/liter for benzene contained in table B-1 of Ecology's Draft Vapor Intrusion Guidance. In addition, soil vapor measurements near the Cemetery residence exceeded the Method B soil gas, sub-slab screening level of 3.2 ug/liter for benzene. A further evaluation of the vapor intrusion pathway must be completed for that area of the benzene plume beneath Port property using unrestricted land use screening criteria.

Sufficiency of Delineation

The Addendum concludes that the plume has been sufficiently delineated. Given increases in TPH-G and benzene at MW-22 during the last two sampling rounds, the Port believes a "wait and see" position is more appropriate. The Addendum should include a thorough review of the plume stability after a year of quarterly data has been acquired. At that time, if concentrations of TPH-G and/or benzene show an upward trend in nearby wells, then MW-A should be re-sampled. We believe providing for this contingency is a more protective approach to the potential risks.

Thanks again for the opportunity to comment, please give me a call if you have any questions,

Don Robbins
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Aviation/Environmental
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Contents of Attached File "Copy of Addendum_Comments_093011 (3).xlsx"

Port of Seattle Comments 9/30/11 on:

Golder Associates, Inc., 2011, Technical memorandum, Addendum to SeaTac Development Site RI/FS and Draft CAP, September 15, 2011.

Page	Item	Comment
2	1	Statement is in error. The Port has provided an aerial photograph that is shown in Addendum figures.
2	2	Please specify the vertical datum.
2	3, 4, & Figure 1	Till was logged in wells MW-4, Port_MW-1, and Port_MW-2 and should be shown on the figure.
3, §3	5	The Addendum should state that the next round of water level measurements will include MW-A and MW-B in the groundwater flow path analysis. Port will provide survey data when available.
3, §6	5	When is sampling scheduled to begin under the Compliance Monitoring Plan? Was March 2010 the most recent sampling event?
4	6	Short-term increases in TPH-G and benzene values were reported at MW-22. The Port believes collection of additional groundwater monitoring data is necessary to determine whether contaminant concentrations are stable or declining in wells closest to Port property, especially near MW-B. A contingent task should be added to the addendum to increase the scope of sampling to include MW-A if nearby wells begin to show an upward trend.
6	14	The Port understood at our June 2011 meeting that all data would be presented graphically as an aid to interpretation and results of all sampling events would be included. Also, TPH-G concentration above MTCA in March 2010 indicates that MW-19 should be included in the plots.
7, 8, 9, & 12	Soil Vapor 1, 2, 3, & 4; Section 3.0 2nd bullet	The potential for vapor intrusion must be evaluated for the least restrictive property uses on the Port owned parking lot property south of South 160th Street. The RI/FS has only evaluted this pathway using a "commercial building" scenario.
11	25, 26	The Port will review and comment on the Engineering Design Report and the Compliance Monitoring Plan data and conclusions.
12	Section 3.0, 1st bullet	MW-B is on the South 160th Street right-of-way.
	Table B-1	Groundwater MTCA A table value should be 800 ug/L since benzene was detected in MW-B.
	Figure 4	What criteria were used to define the plume boundary, particularly near MW-B and MW-A? MW-19 should be included within the plume boundary, given the TPH-G increase to 1300 ug/L in 3/10, the most recent data available.

APPENDIX B. TECHNICAL MEMORANDUM

RE: ADDENDUM TO SEATAC DEVELOPMENT SITE RI/FS AND DRAFT CAP

(NEXT PAGE)

TECHNICAL MEMORANDUM

Date:	October 11, 2011	**Project No.:**	073-93368-05.03
To:	Jerome Cruz	**Company:**	Washington State Department of Ecology
From:	Douglas Morell & Kirsi Longley		
cc:	Donald A. Robbins, Port of Seattle	**Email:**	DMorell@golder.com KLongley@golder.com

RE: ADDENDUM TO SEATAC DEVELOPMENT SITE RI/FS AND DRAFT CAP

1.0 INTRODUCTION

This Golder Associates Inc. (Golder) Technical Memorandum is an Addendum to the SeaTac Development Site's Remedial Investigation/Feasibility Study (RI/FS) and Draft Cleanup Action Plan (CAP) (Golder 2011a) that were submitted to the Washington Department of Ecology (Ecology) on April 14, 2011 and underwent a public comment period during May 2011. This addendum will be attached to Ecology's Responsiveness Summary to the Final CAP. The Port of Seattle comments (presented in a letter dated May 27, 2011) represented the bulk of comments received by Ecology. A conference call with Ecology, the Port of Seattle and the SeaTac Development Site's PLP Group (PLP Group) representatives was held on June 14, 2011 and a follow-up meeting was conducted on June 27, 2011 to discuss the Port of Seattle's comments. Based on the conference call and meeting with Ecology and the Port of Seattle, each comment was discussed and categorized according to the four following criteria:

- Category 1: Important issue to revise and re-issue the RI/FS or Draft CAP
- Category 2: Requires a written explanation as a response in the Responsiveness Summary or an amendment to the RI/FS or Draft CAP without re-issuing either document for public review
- Category 3: Requires a written explanation as a response in the Responsiveness Summary, does not require re-issuing of either the RI/FS or DCAP
- Category 4: Requires discussion among experts to further resolve during a meeting

An earlier Golder Technical Memorandum (dated June 16, 2011) (Golder 2011b) identified the appropriate category for each Port of Seattle comment based on discussions and agreements during the conference call on June 14, 2011 by the participants. There were no Category 1 issues identified and thus it is not necessary to revise and re-issue the RI/FS or the Draft CAP. Comments identified as Category 4 were discussed with experts representing Ecology, the Port of Seattle, and Golder. The meeting resolved Port of Seattle Category 4 comments. The intent of this document is that it be included as an Addendum to the SeaTac Development Site's RI/FS and CAP and included in the site administrative record at Ecology. This Addendum follows the general format of the Port of Seattle's May 27, 2011 letter.

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2.0 PORT OF SEATTLE WRITTEN COMMENTS & PRP GROUP RESPONSES

1. An outline of new Port RCF structures (Port property), north of South 160th Street, on figures would be useful to show current land use and adjacent site conditions.

   RESPONSE: The construction of the Port of Seattle facility north of South 160th Street has been continually changing and thus has not been included on any figures in the RI/FS and DCAP. However, all future figures will include the final layout of the new Port facility. To facilitate this update to base maps, the Port provided their most current aerial photographs of the Port property.

2. Identification of survey datums (not specified in RIFS §3.4) would be helpful for comparisons with Port data.

   RESPONSE: The survey datum used for the survey data in RI/FS Appendix E was NAD83 Washington State Planes, North Zone, US Foot for horizontal and City of SeaTac-NAVD 88 for vertical.

3. Preparation of geologic cross sections is highly recommended for hydrogeologic evaluation and for review of conclusions and proposed remediation alternatives. No geologic cross sections were presented in the RIFS or DCAP.

   RESPONSE: Geologic cross-sections are typically provided in RI/FS documents to illustrate complex geologic stratification. The geologic stratification at the site is not complex and therefore does not require detailed geologic cross-sections for illustration, but attached Figure 1 identifies the extent of the till discovered during site investigations.

4. The presence or absence of glacial till could affect contaminant migration and soil vapor pathways. Preliminary review indicates that the till unit appears to be discontinuous within the identified boundaries of the contaminant plumes[1]. A map of till thickness, and identification of any other confining units, would be very helpful for interpretations and evaluations.

   RESPONSE: The till at the site is present in the eastern, central and southern portions of the facility. However, the till is absent in the northwestern portion of the facility and was not observed in off-site borings within South 160th Street or in borings on the cemetery property to the west of the site where groundwater impacts are present. Figure 1 shows the limits where till was observed during borehole drilling. There were no other confining units of any extent or continuity observed during borehole drilling at the site.

5. About thirteen wells were used to define groundwater flow directions south of South 160th Street. However, there are no monitoring wells north of South 160th Street to define local flow directions on the Port property. Since the groundwater contours in this area are relatively flat (i.e. hydraulic gradients are small), there is no guarantee that flow directions on the Port property are the same as on the MasterPark site. Item 6, below, notes that there are logistical constraints in locating wells on the Port property.

   RESPONSE: A previous groundwater investigation by the Port of Seattle in 2004 was conducted north of South 160th Street near the intersection of South 160th Street and International Boulevard (EMS 2004). The Port of Seattle installed monitoring wells Port MW-1, Port MW-2, and Port MW-3 shown on the attached Figure 2 (as also depicted on Figure 4 of the Draft CAP). The Port of Seattle

[1] Absence of till is noted at MasterPark well MW-22 and Port borings (RCF baseline study) located about 90 feet north and 200 feet north-northwest of MasterPark well MW-16. Till has been interpreted on the site (e.g. MW-9, MW-1, and MW-7) and also on Port property (at the southeast corner and thence north along International Blvd).

concluded that groundwater within the Qva Aquifer was flowing toward the west, based on groundwater levels measured in their monitoring wells. Golder monitored water levels in these Port of Seattle wells and also concluded that the groundwater was flowing westerly on Port property north of South 160th Street. The analytical results of groundwater from the Port of Seattle wells did not detect any petroleum hydrocarbons or associated gasoline compounds in 2004 (EMS 2004).

The Port of Seattle also conducted baseline soil and groundwater investigations during 2008 at the beginning of the construction for the Rental Car Facility (RCF) (Aspect 2008). One borehole (designated NON-GW-DV) north of South 160th Street located north of the MasterPark Lot C Well MW-15 and two other boreholes (designated GTS-GW-TF and GTS-GW-FD) located north and northwest of MasterPark Lot C MW-22 were completed during this 2008 baseline study (see attached Figure 3). Soil and groundwater samples from these borings did not detect any petroleum compounds or gasoline compounds or additives. There was only a temporary well placed within each borehole for groundwater sampling. These were abandoned after one groundwater sampling event. Therefore, in 2008 there was no indication of groundwater impacts from MasterPark Lot C sources north of South 160th Street.

As noted, the groundwater hydraulic gradients are low, but there is no reason to suspect that the hydraulic gradients north of South 160th Street are significantly different than hydraulic gradients south of the South 160th Street. In the past, land north of South 160th Street was a large asphalt paved parking lot that prevented any significant area recharge via infiltration of meteoric rainfall. The currently constructed Port of Seattle facility is also expected to prevent significant area recharge from occurring due to the land being covered by impervious surfaces. Thus, there should be no significant change in groundwater flow pattern as a result of the new Port of Seattle facility.

In our meeting with Ecology and the Port of Seattle representatives on June 27, 2011, it was agreed that additional permanent monitoring wells will be installed at two locations on Port of Seattle property north of South 160th Street. The additional monitoring wells are designated Port MW-A and Port MW-B as shown on Figure 4 and was meant to better delineate any petroleum hydrocarbon plume north of South 160th Street (on Port of Seattle property) originating from the MasterPark Lot C facility.

Port MW-A and Port MW-B monitoring wells were installed during early August 2011. The borehole and monitoring logs for Port MW-A and Port MW-B are provided in Appendix A to this Addendum. The results of groundwater quality analysis from these two new monitoring wells are provided in Appendix B. No gasoline, diesel, or oil was detected in groundwater samples from Port MW-A well. Groundwater from the Port MW-B well had low level detects of gasoline, diesel, and BTEX in groundwater (benzene was 1.3 µg/L) detected; however, there were no organic compounds related to petroleum fuels detected above their respective MTCA Cleanup Levels. These groundwater quality results indicate that the gasoline plume originating from the MasterPark Facility is delineated to the north of the MW-15 well and northwest of MW-22.

The Port of Seattle will survey the geodetic X, Y, and Z locations for groundwater elevations and re-sample groundwater from Port MW-A and Port MW-B wells

again during Autumn, 2011. This information will be used to determine groundwater elevations at the new wells and confirm groundwater quality results from the first sampling event.

Groundwater Monitoring

6. The Compliance Monitoring Plan (CMP) (Attachment E to DCAP) proposes only one new monitoring well on Port property; MW-X was positioned about 270 feet northwest of MW-22, which appears to fall within an RCF structure. Logistical constraints, due to access issues associated with the new Rental Car Facility, are not addressed for locating monitoring well(s) on or near the Port property.

   RESPONSE: The location of MW-X was not a proposed exact location, but rather an approximate position. The layout of the facility under construction had to be considered for the final placement of MW-X.

   Based on our meeting with Ecology and the Port of Seattle representatives on June 27, 2011, the two additional permanent monitoring wells (Port MW-A and Port MW-B) were installed at two locations on Port of Seattle RFC property and within the S. 16th Street right-of-way, respectively, as shown on attached Figure 4. The results of groundwater quality analysis after well installation have been received and evaluated in response to Port of Seattle Comment #5 above. It is Golder's determination that the gasoline plume originating from the MasterPark Lot C facility is sufficiently delineated in the north direction. Preliminary results (Table B-1 in Appendix B) show that the Port MW-B monitoring well is detecting petroleum hydrocarbon contaminants below cleanup levels. Therefore, the plume's northwest extent appear to have been sufficiently characterized and unless these levels are exceeded in subsequent measurements from this well, MW-X will not be needed.

7. Would one well be sufficient for defining plume boundaries and monitoring natural attenuation on Port property?

   RESPONSE: We believe that one well would be sufficient to bound the groundwater petroleum hydrocarbon plume in the northeast direction from the source on the MasterPark Lot C facility with the data and information obtained by the Port of Seattle from earlier investigations they conducted on their property. Nevertheless, two additional wells (Port MW-A and Port MW-B) now have been installed and sampled, as agreed upon during a meeting with the Port of Seattle on June 27, 2011 (please see our response to Port of Seattle comment No. 5 above) and have provided data that helped delineate the MasterPark Lot C petroleum hydrocarbon plume to the north and northwest.

8. Well MW-23, located 130 feet east of MW-15, appears to have been removed from the monitoring well network (e.g. DCAP Figure 9 and Attachment E, Compliance Monitoring Plan §5.1). No monitoring well(s) is proposed to bound contaminant plumes on Port property north or east of MW-15. Should MW-23 be retained in the groundwater monitoring network?

   RESPONSE: MW-23 is a well up-gradient from the source on the MasterPark Lot C facility and was installed to confirm the non-detect results from the Port of Seattle's temporary Port MW-1, Port MW-2, and Port MW-3, formerly located on the RCF property at the northwest corner of the South 160th Street and

International Boulevard. Furthermore, installation and initial sampling of MW-23 was to confirm the non-detect results from other investigations conducted on the east side of International Boulevard that are also up-gradient to the MasterPark Lot C facility. Results collected from MW-23 confirmed there were no detections of contaminants from up-gradient potential sources. Because MW-23 is located up-gradient from the MasterPark Lot C source, Ecology and Golder determined this well no longer needs additional monitoring.

A monitoring well (designated Port MW-A on attached Figure 4) north of monitoring well MW-15 has been installed and sampled, as agreed during the June 27, 2011 meeting. Port MW-A well did bound the petroleum hydrocarbon plume north of MW-15.

Contaminant Plumes in the Regional Qva Aquifer

9. Gasoline and benzene plumes were estimated to be migrating to the northwest onto Port property (RIFS §4.4.2.1, pg 38). The methodology used (RIFS §4.4.2.1) assumed only an advective (bulk movement) process and further assumed a northwest groundwater flow direction. Contamination migration by diffusion and dispersion processes does not appear to have been addressed. The actual extent of gasoline and benzene plumes onto Port property has not been determined.

   RESPONSE: The actual extent of gasoline and benzene impacts within the Port of Seattle property north of South 160th Street is not fully delineated. As agreed during the June 27, 2011 meeting two additional monitoring wells (Port MW-A and Port MW-B) were installed to delineate the petroleum hydrocarbon plume migrating onto Port of Seattle property as discussed in our response to Port of Seattle comment No. 5. Preliminary results from these wells have provided a better picture of the plume's north and northwest extents.

   Diffusion is a solute migration process that results in very little actual migration of solutes in a groundwater flow system. Diffusion only needs to be considered as a solute migration mechanism through very low conductivity materials, such as clays, where groundwater advection is extremely slow with time. Dispersion processes can be estimated by installation and monitoring of the Port MW-B well together with groundwater monitoring results from MW-22, MW-16, and MW-12 for longitudinal dispersion. Because the hydraulic gradient is not uniform and does vary from northwest to southwest, transverse dispersion will not be able to be estimated from groundwater concentration profiles, but can be estimated based on longitudinal dispersivity.

10. Have the groundwater contaminant plumes been demonstrated to be shrinking, stable, or growing? Gasoline concentration data at MW-22, for example, may indicate an expanding plume.

    RESPONSE: Most of the on-site monitoring wells show groundwater concentrations to be declining, while the concentrations in groundwater from MW-22 location are increasing. We feel that the destruction of the source concentrations within the MasterPark Lot C facility groundwater will stabilize and start to reduce groundwater concentration off-site. The graph shown on Figure 4-1 of the RI/FS Report shows a declining concentration trends for groundwater at the SeaTac Development Site, except for MW-22. Further northwest of MW-22, preliminary results from Port MW-B well show contaminant concentrations

below MTCA Method A cleanup levels. The DCAP Compliance Monitoring Plan will use these and other wells along a centerline axis to determine plume stability under the natural attenuation component of the DCAP.

11. As noted in the RIFS, opportunities for monitoring wells are limited north of South 160th Street. One monitoring well was proposed on Port property, but see Item 6 related to logistical constraints.

    RESPONSE: This comment was addressed in our response to Port of Seattle Comment No. 5.

12. As groundwater flow directions on Port property have not been determined (Item 5), the assumption of northwest flow from MW-22 requires further investigation.

    RESPONSE: This comment was addressed in our response to Port of Seattle Comment No. 5

13. Analysis of diffusion and dispersion effects on contaminant migration would improve estimates of the extent of contamination plumes onto Port property.

    RESPONSE: Please see our response to Port of Seattle Comment No. 9.

14. For interpretation, it would be helpful to extend the time scale of groundwater COC time series (trend) plots to cover all available historical data. The plots currently show data from August 2007 to March 2010, while it appears that the first regional groundwater monitoring wells were installed and sampled in 2001.

    RESPONSE: We have provided the concentrations of gasoline and BTEX in wells that existed prior to 2007 in the appended table. This data was originally presented in the *Phase III Environmental Site Assessment SeaTac Parking Garage Development Site* report (Golder 2001) and was included in Appendix B of the RI/FS report (Golder 2010). The 2000 and 2001 data was not added to trend graphs because the data is limited in nature and does not provide a meaningful analysis when displayed on the time series graph alongside the more recent groundwater sampling data (2007-2010) for the following reasons:

    - MW-1 was the only well sampled in November 2000 that is still an active well on the site. However, MW-1 has not been sampled since 2001 because during each of the successive sampling events (2007, 2009, and 2010) this well has not had a sufficient volume of water to collect a sample. Sample results from MW-13 and MW-18 are sufficient to characterize this area of the site and thus MW-1 sample results are not necessary. Given that only two data points exist for MW-1, there is not enough data to display on a time series (trend) graph.
    - During the January 2001 sampling event, samples were collected from MW-1, MW-5, MW-6, MW-7, MW-8a, MW-9, and MW-10, as they were the only wells installed at the site at that time.
    - There were no sampling events between 2001 and 2007. It is difficult to display any sort of trend overtime when there are so few data points and such large gaps between sampling events.

    The gasoline and benzene data from 2000 and 2001 indicate that concentrations were generally higher than exist currently.

15. The extent of vertical migration of contaminants into the Qva aquifer should be more closely evaluated. Statements in the RIFS suggest no vertical migration has occurred (RIFS §4.4.2.1, pg 39 and §4.4.2.2, pg 40). However, deep well MW-10 was screened

about 95 below ground surface (bgs), about 40 feet into the aquifer, and had initial detections of gasoline at 1,600 µg/L and benzene at 31 µg/L after well installation in 2001. The boring log indicated petroleum odors and elevated PID readings to a depth of 60 feet below ground surface, or 15 feet into the aquifer saturated zone.

RESPONSE: Monitoring well MW-10 was drilled and installed in 2001 in a deeper portion of the aquifer in close proximity to MW-1, to determine the vertical hydraulic gradient in the regional aquifer at MW-1. In addition to establishing the vertical hydraulic gradient, MW-10 was utilized to determine if deeper portions of the aquifer had been impacted by petroleum hydrocarbon contamination. The groundwater concentrations from monitoring well MW-10 are much lower than the groundwater concentrations in MW-1 that is near MW-10 and received groundwater from the surface of the water table. As noted in the comment, the PID measurements obtained on soil samples during MW-10 borehole drilling indicated that petroleum impacts dramatically reduced below 60 feet. The impacts locally near the source are expected to have penetrated the surface of the water table by approximately 10 to 15 feet. After MW-10 installation, groundwater concentrations in 2001 slightly exceeded MTCA Levels in MW-10 (see the table below). However, subsequent sampling events in 2009 (two events) and 2010 (one event) have not detected gasoline in groundwater at MW-10 above the laboratory PQL (see below table of results). Furthermore, detections of benzene in MW-10 have steadily decreased over time and the last two sampling events have resulted in detections of benzene less than the MTCA Method A cleanup level. This detection could have been the result of contaminant carry-down during borehole drilling. These results from MW-10 indicate that vertical migration of COCs is not of concern; rather detections in MW-10 are due to carry-down of contamination during borehole drilling. As such, MW-10 will not be included in the compliance monitoring program.

Sampling Event Date	Gasoline Concentration (µg/L)	Benzene Concentration (µg/L)
January 8, 2001	**1,600**	**31**
May 20, 2009	<100	**8.7**
December 7, 2009	<100	2.9
March 2010	<100	1.1
MTCA Cleanup Level	800	5

Soil Vapor Issues

1. Vapor intrusion screening levels were exceeded near South 160th Street for groundwater (above Method B and very close to Method C) and for shallow soil (above Method B but below Method C). Assessment of vapor intrusion exposure pathways for any new RCF structures may be appropriate.

RESPONSE: The soil vapor sampling results indicate there is no risk from vapor intrusion into commercial buildings that are immediately adjacent to the source area within the MasterPark Lot C facility. There is no reason to suspect that there is a vapor intrusion concern further away from the source where groundwater concentrations are much less and the depth to groundwater is much greater. The groundwater quality results from the two additional monitoring wells (Port MW-A and Port MW-B) that were installed and sampled north of South

160th Street on Port of Seattle property indicate that there is no potential risk from vapor intrusion into the RCF building from vapors emanating from the groundwater.

2. The DCAP does not propose soil vapor monitoring or further vapor intrusion evaluation. The RIFS (§4.3.2) implies that a risk analysis for benzene using Method C, shallow soil, screening level (32 µg/L) found no risk to indoor commercial workers. The DCAP (§3.5.3) indicates that a vapor intrusion "Tier I preliminary assessment"[2] was performed with the conclusion that since "soil vapors are below shallow soil screening levels at the property boundary, there is no unacceptable risk from vapor intrusion into current commercial buildings to workers on the Site (but off of the MasterPark Facility)." The basis for stating that "soil vapors are below shallow soil screening levels" evidently refers to the benzene Method C, shallow-soil screening level of 32 µg/L. However, the benzene concentration in groundwater at MW-22 was 23 µg/L, which is very close to the MTCA C groundwater screening level of 24 µg/L. The elevated benzene concentration indicates that a vapor intrusion pathway from groundwater may need to be further evaluated under areas of the contaminant plume outside of the source area. Have off-site, potential vapor intrusion issues related to high benzene concentration in MW-22, observed during March 2010 sampling, been addressed?

   RESPONSE: The groundwater concentration of 24 µg/L is a conservative screening concentration in the Ecology guidance document based on shallow groundwater, not groundwater over 50 feet deep. The soil gas concentrations measured at 10 foot depths are a more direct indication of potential vapor intrusion risks than the use of underlying groundwater concentrations, because it directly measures the soil gas concentrations, rather than calculating a potential soil vapor concentration emanating from groundwater using many assumptions. In 2007, the soil vapor concentrations were all below the MTCA screening level for commercial buildings along MasterPark's northern property boundary where the underlying groundwater is less than 50 feet below land surface and has much higher benzene concentrations than those detected in MW-22. The measured soil gas concentrations in 2009 were again below the Ecology screening levels for commercial buildings near the source area along the MasterPark Lot C northern property boundary, where again the groundwater has much higher benzene concentrations and is shallower than at MW-22. The expected groundwater depths and groundwater concentrations within the Port of Seattle property north of South 160th Street are anticipated to also be deeper and at much lower concentrations than what exists at the MasterPark Lot C facility. The soil gas sampling results are a better indicator of potential vapor intrusion than groundwater concentrations and were the basis for our conclusions that no risk from vapor intrusion exists into adjacent commercial buildings and other commercial buildings at further distances from the MasterPark Lot C source area.

   We do not believe there is a potential threat from vapor intrusion in the RCF from groundwater. The groundwater quality results from the two additional monitoring wells (Port MW-A and Port MW-B) that were installed and sampled north of South 160th Street indicate volatile organic compounds concentrations are too low to be of concern for vapor intrusion into a commercial building.

[2] This terminology is not clear. Ecology (2009, pg 3-1) states that the recommended vapor intrusion evaluation process consists of three steps: Preliminary Assessment, Tier I Assessment, and Tier II Assessment.

3. The vapor intrusion risk analysis (RIFS §4.3.2) and "Tier I preliminary assessment" (DCAP§3.5.3) mentioned in the RIFS and DCAP, respectively, were not referenced and therefore not reviewed. Can these studies be provided for review? Did these studies evaluate the 2009 shallow soil vapor results near the Cemetery residence and the groundwater benzene concentrations in MW-22?

   RESPONSE: We did not do a formal Preliminary Assessment, because the existing groundwater impacts would require a Tier 1 Assessment at a minimum. The Tier 1 Assessment is based on the Ecology document "Guidance for Evaluating Soil Vapor Intrusion in Washington State: Investigation and Remedial Action" (Ecology, October 2009, Publication No. 09-09-047) as referenced in the introduction to Section 4.3. The Tier 1 approach asks basic questions and provides off-ramps for situations where it is apparent that subsurface contamination is very unlikely to pose a vapor intrusion threat. The vadose zone source area does not have a building in close proximity; therefore, the pathway of volatilization from groundwater and migration through the vadose zone is the only pathway off the MasterPark Lot C property to neighboring buildings and properties. To evaluate whether there is a potential threat from vapor intrusion, on-site soil gas concentrations were compared with Table B-1 of the Ecology referenced document. The locations, where soil vapor sampling was conducted in 2009 and many of the 2007 sampling locations, do not have a till stratum present that would impede vertical migration of soil vapors. Since the soil gas concentrations are below screening values in Table B-1 for soil gas immediately below a commercial/industrial building (although our samples were at 10 foot depths), the Tier 1 Assessment shows that there is no threat from vapor intrusion of site contaminants to off-site commercial or industrial buildings using either the 2007 or 2009 soil gas data.

   Vapor intrusion to the residence on the cemetery property was evaluated from the analytical results of soil vapor samples surrounding the house and the house crawl space atmosphere sample. The results and evaluation are presented in the RI/FS. The subject residential house has recently been demolished and the land will not be used for residential use in the foreseeable future.

4. Vapor migration pathways, such as subsurface utility line (SUL) trenches, have not been considered.

   RESPONSE: Our soil gas monitoring results represent a depth of 10 feet that is below typical utility installations. Therefore, the soil gas concentrations are lower than screening levels beneath anticipated utility corridors.

20. The RIFS and DCAP propose monitored natural attenuation (MNA) of the contaminant plumes, outside the treatment area and including off-site properties. The MNA process requires multiple lines of evidence for reaching a determination that natural attenuation is occurring, including (1) long-term decrease of contaminant concentrations, (2) assessment of geochemical parameters, and (3) microbial studies. Evaluation of monitored natural attenuation (MNA) was not addressed in the RIFS (§7.1.2, pg 55) and appears to be described only by reference to the Ecology (2005) guidance document in the DCAP (Attachment E, CMP §5.1.3). Please provide additional details on the proposed MNA assessment process.

RESPONSE: Evaluation of MNA is proposed during post remediation confirmational monitoring. Details are presented in the Compliance Monitoring Plan Table 1 and the referenced Ecology document on MNA evaluations (Ecology 2005, Publication No. 05-09-091). Table 1 of the Compliance Monitoring Plan lists the wells involved in the MNA evaluation, the sampling frequency, and the MNA parameters that will be analyzed.

21. **RESPONSE:** The Port of Seattle is missing a comment enumerated as 21.

22. The DCAP does not appear to have specified a feasible plan for groundwater monitoring north of South 160th Street.

RESPONSE: In the Draft CAP, compliance groundwater monitoring is proposed north of South 160th Street by monitoring MW-X (or the additional Port of Seattle Port MW-B well), MW-22, and MW-15. Compliance monitoring will replace well MW-X with the newly installed Port MW-B well. If well MW-X becomes required to install, it will replace compliance monitoring of Port MW-B well.

The newly installed Port MW-A monitoring well will be monitored after the remedial system is turned off for confirmational monitoring. If the results are below MTCA Cleanup Levels, Port MW-A well will not be sampled again.

The changes in groundwater concentrations with time from these compliance monitoring wells will provide adequate indication of MNA and plume strengths in the Qva aquifer north of South 160th Street.

23. The CMP lists contaminants and geochemical parameters (DCAP, Attachment E, CMP Table 1 footnotes) and sampling parameters (DCAP, Attachment E, CMP §6.2.2) for MNA. Redox (Eh) and dissolved oxygen (DO) are commonly measured sampling parameters that should be included.

RESPONSE: If Eh (indicator of REDOX conditions) was left out of the field parameters, we will include this measurement. Dissolved oxygen (DO) is included as a natural attenuation parameter in the Table 1 footnotes of the Compliance Monitoring Plan. The REDOX condition, even without Eh field measurements, will be understood from DO field measurements and the laboratory results for valance specific analytes proposed for MNA evaluations.

24. Does the proposed remediation Alternative A provide for effective capture of vapors generated by air sparging? The air sparging will occur at about 50 feet below ground surface and 10 to 20 below the till layer, where present. How will the combination of extraction wells and trenching work given these two features may be separated by a till layer? Can lateral migration of vapors occur such that vapors bypass the capture zone?

RESPONSE: We believe that the trenches in the locations proposed will be effective in capturing the soil vapors as long as the till layer is not present. The presence of till will be evaluated during the installation of air sparing wells. If till is encountered, then soil gas extraction wells that extend below the till can be employed. The trenches are proposed in areas covered by asphalt, which should provide a barrier to atmospheric intrusion. The area not completely covered by asphalt is the MasterPark Lot C western property boundary that will use soil

vapor extraction wells just above the groundwater table. As mentioned in earlier responses, the northwest area of MasterPark Lot C being subjected to air-sparging and soil vapor extraction did not observe a till layer in the subsurface geology during borehole drilling.

25. At what depth in the regional aquifer will the sparging wells be completed? See Item 15 above regarding vertical migration of contaminants deeper into the water table.

RESPONSE: We are planning on setting the air-sparging wells at a depth of 15 feet below the low groundwater table. Specifications for the remediation system will be detailed in the Engineering Design Report.

26. What depths are proposed for the extraction wells and trenching?

RESPONSE: The soil vapor extraction wells along the western property boundary are planned to be 40 to 45 feet in depth (5 to 10 feet above the water table) at the well bottom. The soil vapor extraction trenches are anticipated to be five to ten feet deep. Specifications for the remediation system will be detailed in the Engineering Design Report.

27. Does the proposed plan adequately provide for monitored natural attenuation of off-site plumes, especially for the Port property north of South 160th Street? See related comments above under *Groundwater Monitoring* and *Contaminant Plumes in the Regional Qva Aquifer*.

RESPONSE: This comment was addressed in our response to Port of Seattle Comment Nos. 9, 20, 22, and 23.

28. In the discussion of remediation alternatives, it would be helpful if scores, weighting values, and alternatives B1 and B2 were included in the RIFS §8 subsections. The list in RIFS §8.3.4 appears to have Alternatives B and E reversed.

RESPONSE: Table 8-7 in the RI/FS and Table 1 of the Draft CAP provide the remedial alternative scores and weighting factors. The table also presents the overall evaluation ranking for the remedial alternatives. The listed remedial alternatives in the RI/FS within Section 8.3.4 do not have Alternatives B and E reversed. The list is the same relative order that was used in Table 8-7 for scoring and ranking the remedial alternatives.

29. A pre-design evaluation does not appear to have been performed to estimate radius of influence of the sparging or extraction wells. A radius of influence for air injection wells was assumed to be 25 feet (50-foot well separation).

RESPONSE: We have planned for a pre-design test for evaluating the radius of influence for air-sparging. However, conducting such tests may have limited value because of local heterogeneity and variability of results. We are currently evaluating whether instead of conducting the pre-design test, the funds for the pre-design test could be used to instead install the air-sparging well system with a closer radius.

3.0 POINTS FOR CLARIFICATION

During the June 27, 2011 meeting with Ecology and the Port of Seattle, several points of clarification were suggested by the Port of Seattle's consultant. The points of clarification are as follows:

- **Add the new Port of Seattle property wells to the Compliance Monitoring Plan.**

  During the June 27, 2011 meeting among the Port of Seattle, Ecology and PLP Group representatives, the decision was made to install two new monitoring wells north of South 160th Street. The new wells will be included on all future maps depicting the site (see the attached Figure 4). The monitoring well, designated as Port MW-B, is within the S. 160th Street right-of-way and will be monitored in accordance with the Compliance Monitoring Plan as a replacement for well MW-X, unless well MW-X is required to be installed. Furthermore, the well, designated MW-X in the Draft CAP, does not need to be installed based on the preliminary analytical results of groundwater from Port-MW-B monitoring well. As such, the new well Port MW-B will be sampled during performance monitoring events (quarterly for year 1 and semi-annually for years 2 through the end of IAS/SVE operation) and during confirmational monitoring events (quarterly for year 1 and semi-annually for years 2 through the closure of the site). The new Port MW-B well will also be sampled for natural attenuation parameters quarterly during the first year of confirmational monitoring (unless it is eventually replaced with a new well MW-X).

  The new well, Port MW-A, is within the Port of Seattle property north of S. 160th Street and may be sampled after the remedial system is turned off for confirmation. If monitoring for Port MW-A has groundwater petroleum fuel-related analytes below MTCA Cleanup Levels, Port MW-A will not be further sampled.

- **Port of Seattle Property vapor intrusion potential.**

  Based upon the sampling results of groundwater from monitoring wells Port MW-A and Port MW-B, the VOC concentrations in groundwater are too low to be a threat to human health in a commercial building from vapor intrusion on the Port of Seattle property. Groundwater concentrations from these two new wells are below screening levels in Ecology's draft guidance document for Vapor Intrusion (Ecology, 2009). This evaluation provides a conservative estimate that vapor intrusion into commercial buildings is not a potential threat given the existing groundwater concentrations and the depth of groundwater.

4.0 DOCUMENTS REFERENCED

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EMS Consultants, Inc., 2004. Results of Groundwater Monitoring Well Installation and Sampling – Bai Tong Restaurant Site, 15859 International Boulevard, Seatac, WA. Prepared for Port of Seattle. May 21.

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Golder 2011a. Draft Cleanup Action Plan, SeaTac Development Site, SeaTac, Washington, April 14.

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Washington State Department of Ecology (Ecology). 2005. Guidance on Remediation of Petroleum-Contaminated Ground Water by Natural Attenuation, Toxics Cleanup Program, Publication No. 05-09-091 (Version 1.0), July.

Washington State Department of Ecology (Ecology). 2009. Guidance for Evaluating Soil Vapor Intrusion in Washington State: Investigation and Remedial Action, Review DRAFT, Toxics Cleanup Program, Publication No. 09-09-047, October.

FIGURES

LEGEND:

MW-5	QVA AQUIFER MONITORING WELL LOCATIONS
MW-2	MONITORING WELLS SCREENED IN PERCHED AQUIFER
PORT MW-1	PORT OF SEATTLE (QVA) MONITORING WELLS (ABANDONED)
TACO TIME D	TACO TIME (QVA) MONITORING WELL (ABANDONED)
	TILL LAYER PRESENT

0 100 200

SCALE IN FEET

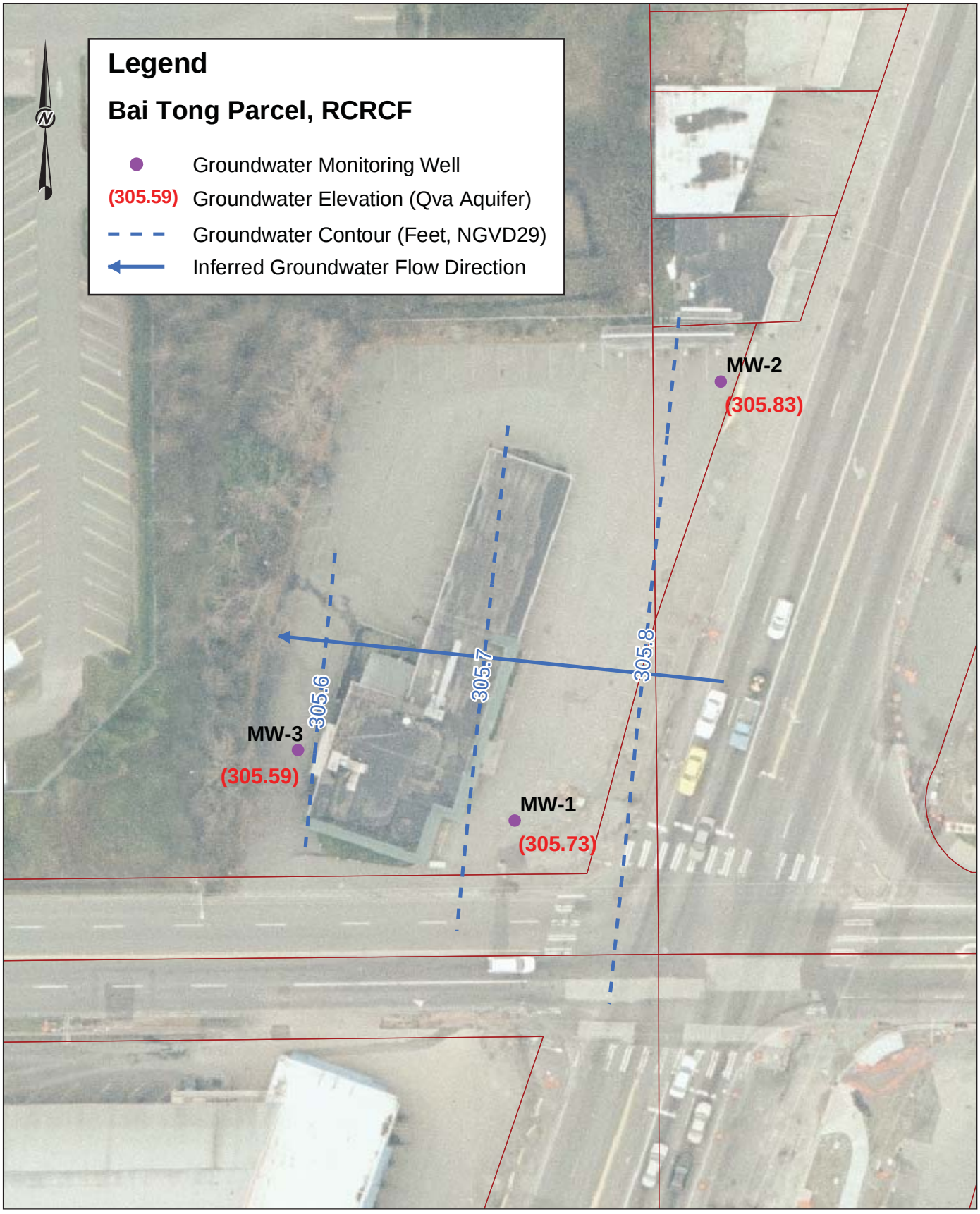
FIGURE **1**

TILL LAYER OBSERVED IN BOREHOLES

SEATAC DEVELOPMENT SITE/RI/FS/WA

K:\CAD\Projects\2007\07393368\05\04\CAP - Addendum\073_93368_05_04_F01_r1.dwg | Fig 1 | Mod: 10/12/2011, 09:14 | Plotted: 10/12/2011, 09:14 | SSimmons

Golder Associates



0 50

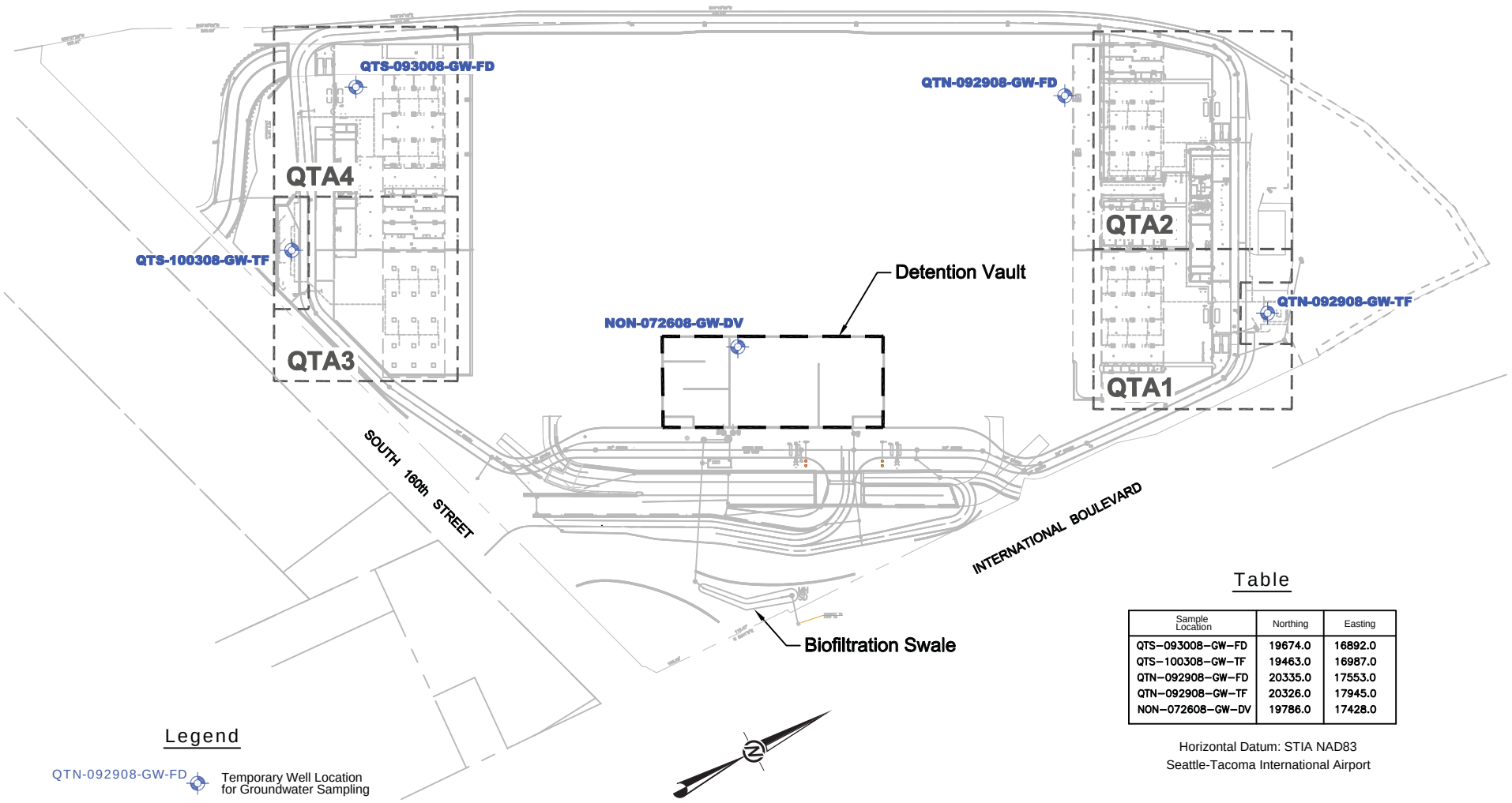
APPROXIMATE SCALE IN FEET

Source: EMS, May 2004

FIGURE **2**

GROUNDWATER FLOW DIRECTION ON THE PORT OF SEATTLE PROPERTY IN 2004

RW/MASTERPARK LOT C RI/FS &REMED/WA



Table

Sample Location	Northing	Easting
QTS-093008-GW-FD	19674.0	16892.0
QTS-100308-GW-TF	19463.0	16987.0
QTN-092908-GW-FD	20335.0	17553.0
QTN-092908-GW-TF	20326.0	17945.0
NON-072608-GW-DV	19786.0	17428.0

Horizontal Datum: STIA NAD83
Seattle-Tacoma International Airport

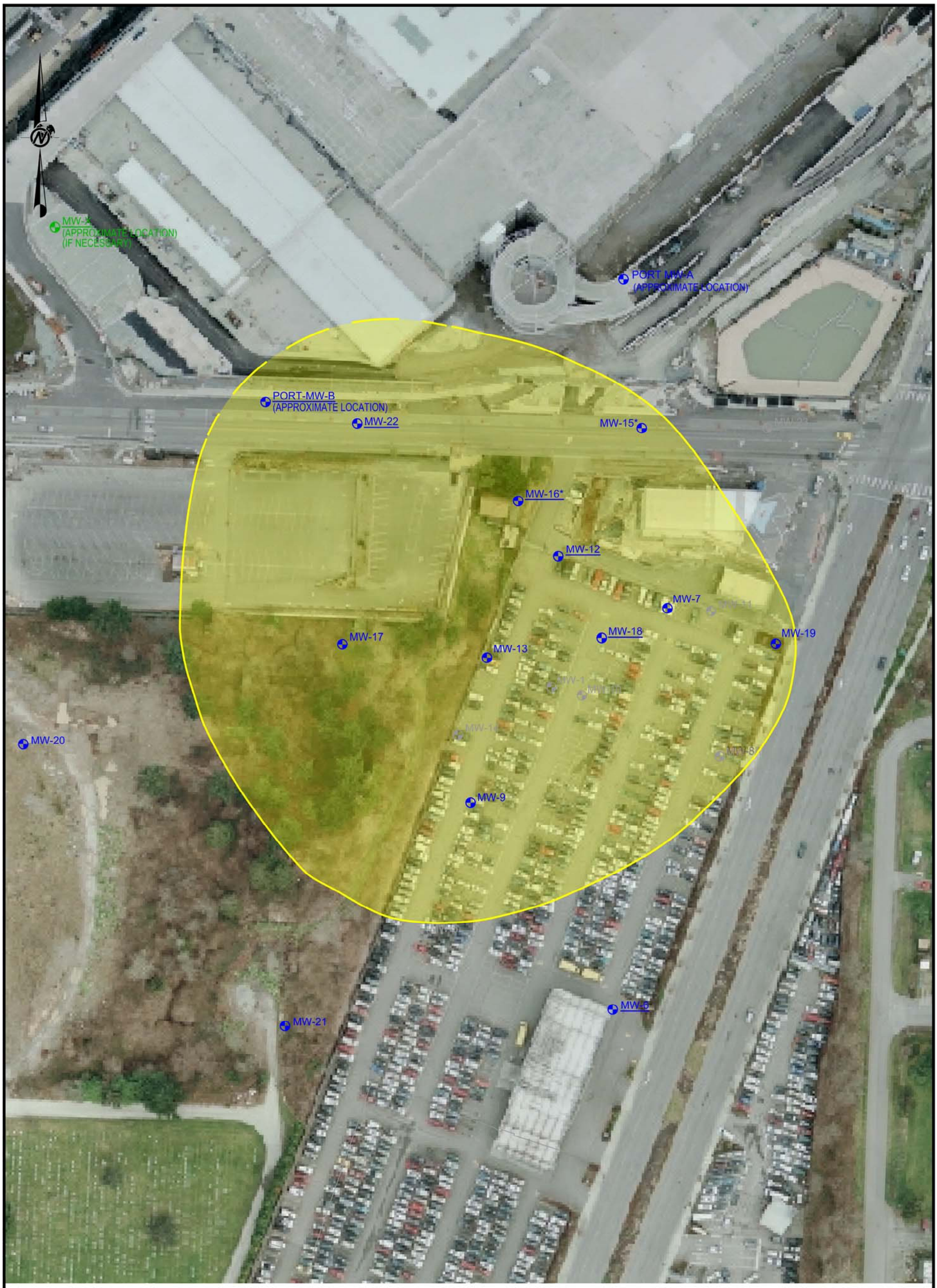
Source: Aspect Consulting, June 2011

FIGURE **3**

GROUNDWATER SAMPLING LOCATIONS AT THE PORT OF SEATTLE PROPERTY IN 2008

RW/MASTERPARK LOT C RI/FS &REMED/WA

Golder Associates



LEGEND:

- MW-17 — COMPLIANCE MONITORING WELLS
- MW-6 — NATURAL ATTENTION WELL
- MW-XX — WELL ONLY INSTALLED IF DEEMED NECESSARY. IF INSTALLED, MONITORING WILL REPLACE PORT-XX.
- APPROXIMATE GW PLUME BOUNDARY

0 100 200

SCALE IN FEET

NOTE:

1. PLUME BOUNDARY BASED ON GROUNDWATER SAMPLE RESULTS EXCEEDING MTCA METHOD A CLEAN UP LEVELS FOR GASOLINE RANGE PETROLEUM HYDROCRABONS (800 UG/L)
2. * = ONLY WELLS THAT ARE NOT PERFORMANCE MONITORING WELLS

FIGURE **4**

LOCATION OF COMPLIANCE MONITORING WELLS

SEATAC DEVELOPMENT SITE/RI/FS/WA

K:\CAD\Projects\2007\07393368\05\04\CAP - Addendum\073-93368-05_04_F04_r2.dwg | F04 | Mod: 10/12/2011, 09:16 | Plotted: 10/12/2011, 09:25 | SSimmons

Golder Associates

APPENDIX A
WELL INSTALLATION LOGS
(MW A and MW B)

Monitoring Well Construction Log

Aspect CONSULTING

Project Number	Well Number	Sheet
090134	MW-A	1 of 3

Project Name: STIA Rental Car Facility
Location: Sea-Tac, WA
Driller/Method: Cascade Drilling / Hollow Stem Auger, 300-lb Jars
Sampling Method: D&M

Ground Surface Elev:
Top of Casing Elev.:
Depth to Water (ft BGS): 53.88
Start/Finish Date: 8/3/2011

Depth / Elevation (feet)	Borehole Completion	Sample Type/ID	Tests	PID (ppm)	Blows/ 6"	Material Type	Description	Depth (ft)
0	8" Flush-mount monument set in concrete					Asphalt	Asphalt	0
1							Very dense, slightly moist, brown to gray, silty, gravelly, SAND (SM); fine to medium sand	1
2								2
3	Concrete							3
4								4
5								5
6		S1		0.1	29 35 40			6
7								7
8			NWTPH-Gx, NWTPH-Dx, Vocs, PAHs, RCRA 8 Metals, PCB					8
9		S2		0.1	42 50		Very gravelly	9
10								10
11								11
12								12
13								13
14								14
15	19 50-lb bags of hydrated Cetco bentonite chips	S3		0.1	46 50			15
16								16
17								17
18								18
19								19
20		S4		0.2	50			20
21								21
22								22
23								23
24								24
25	2" SCH 40 PVC Casing	S5		0.2	43 50		Very dense, slightly moist, brown to gray SAND (SP); trace silt, fine to medium sand	25
26								26
27								27
28								28
29								29

Sampler Type:
- No Recovery
- 3.25" OD D&M Split-Spoon Ring Sampler

PID - Photoionization Detector
- Static Water Level
- Water Level (ATD)

Logged by: MAR
Approved by: RRH
Figure No. B -

_MONITORING WELL_STIA CAR RENTAL FACILITY.GPJ August 24, 2011

Monitoring Well Construction Log

Aspect CONSULTING

Project Number	Well Number	Sheet
090134	MW-A	2 of 3

Project Name:	STIA Rental Car Facility	Ground Surface Elev	
Location:	Sea-Tac, WA	Top of Casing Elev.	
Driller/Method:	Cascade Drilling / Hollow Stem Auger, 300-lb Jars	Depth to Water (ft BGS)	53.88
Sampling Method:	D&M	Start/Finish Date	8/3/2011

Depth / Elevation (feet)	Borehole Completion	Sample Type/ID	Tests	PID (ppm)	Blows/ 6"	Material Type	Description	Depth (ft)
31		S6		0.0	36 50			31
32								32
33								33
34								34
35	Hydrated bentonite chips	S7		0.0	37 50		Gravelly	35
36								36
37								37
38								38
39								39
40		S8		0.2	26 30 35		Slightly gravelly	40
41								41
42	12 50-lb bags of #2/12 Monterey Sand filter pack							42
43								43
44								44
45		S9		0.3	32 38 45		Trace gravel	45
46								46
47								47
48								48
49								49
50	2" SCH 40 PVC 10-slot screen	S10		0.2	42 32 37		Trace silt	50
51								51
52								52
53								53
54	▼						Wet	54
55								55
56		S11		0.0	23 28 34			56
57								57
58								58
59								59

Sampler Type:

- ○ No Recovery
- 3.25" OD D&M Split-Spoon Ring Sampler

PID - Photoionization Detector

- ▼ Static Water Level
- ▽ Water Level (ATD)

Logged by: MAR

Approved by: RRH

Figure No. B -

_MONITORING WELL_STIA CAR RENTAL FACILITY.GPJ August 24, 2011

Monitoring Well Construction Log

Aspect CONSULTING

Project Number	Well Number	Sheet
090134	MW-A	3 of 3

Project Name: STIA Rental Car Facility
Location: Sea-Tac, WA
Driller/Method: Cascade Drilling / Hollow Stem Auger, 300-lb Jars
Sampling Method: D&M

Ground Surface Elev:
Top of Casing Elev.:
Depth to Water (ft BGS): 53.88
Start/Finish Date: 8/3/2011

Depth / Elevation (feet)	Borehole Completion	Sample Type/ID	Tests	PID (ppm)	Blows/ 6"	Material Type	Description	Depth (ft)
61		S12		0.3	20 23 27			61
62								62
63								63
64	Threaded PVC Endcap							64
65	Sluff	S13		0.5	16 23 27		Silt lamina at 65'	65
66							Bottom of Boring at 65.5' BGS	66
67								67
68								68
69								69
70								70
71								71
72								72
73								73
74								74
75								75
76								76
77								77
78								78
79								79
80								80
81								81
82								82
83								83
84								84
85								85
86								86
87								87
88								88
89								89

Sampler Type:
○ No Recovery
◧ 3.25" OD D&M Split-Spoon Ring Sampler

PID - Photoionization Detector
▼ Static Water Level
▽ Water Level (ATD)

Logged by: MAR
Approved by: RRH
Figure No. B -

_MONITORING WELL_STIA CAR RENTAL FACILITY.GPJ August 24, 2011

Monitoring Well Construction Log

Aspect CONSULTING

Project Number	Well Number	Sheet
090134	MW-B	1 of 4

Project Name: STIA Rental Car Facility
Location: Sea-Tac, WA
Driller/Method: Cascade Drilling / Hollow Stem Auger, 300-lb Jars
Sampling Method: D&M

Ground Surface Elev:
Top of Casing Elev.:
Depth to Water (ft BGS): 84.33
Start/Finish Date: 8/2/2011

Depth / Elevation (feet)	Borehole Completion	Sample Type/ID	Tests	PID (ppm)	Blows/ 6"	Material Type	Description	Depth (ft)
1	8" Flush-mount monument set in concrete						Asphalt	
2							Very dense, slightly moist, brown, gravelly, silty SAND (SM); fine to medium sand	1
3	Concrete							2
4								3
5		S1		0.3	50/6			4
6								5
7								6
8								7
9		S2	NWTPH-Gx, NWTPH-Dx, Vocs, PAHs, RCRA 8 Metals, PCB		42 50		Very dense, slightly moist, brown, slightly gravelly, slightly silty SAND (SP); fine to medium sand	8
10								9
11								10
12								11
13								12
14								13
15	40 50-lb bags of hydrated Cetco bentonite chips	S3		0.1	43 50		Very dense, slightly moist, brown, silty, very gravelly SAND (SM); fine to medium sand	14
16								15
17								16
18								17
19								18
20		S4			34			19
21				0.3	36		Very dense, slightly moist, brown, slightly gravelly SAND (SP); fine to medium sand	20
22					40			21
23								22
24								23
25		S5			15		Brown-gray; trace gravel	24
26				0.4	28 30			25
27								26
28								27
29								28
								29

Sampler Type:
- No Recovery
- 3.25" OD D&M Split-Spoon Ring Sampler

PID - Photoionization Detector
- Static Water Level
- Water Level (ATD)

Logged by: MAR
Approved by: RRH
Figure No. B -

_MONITORING WELL_STIA CAR RENTAL FACILITY.GPJ August 24, 2011

Monitoring Well Construction Log

Aspect CONSULTING

Project Number	Well Number	Sheet
090134	MW-B	2 of 4

Project Name:	STIA Rental Car Facility	Ground Surface Elev	
Location:	Sea-Tac, WA	Top of Casing Elev.	
Driller/Method:	Cascade Drilling / Hollow Stem Auger, 300-lb Jars	Depth to Water (ft BGS)	84.33
Sampling Method:	D&M	Start/Finish Date	8/2/2011

Depth / Elevation (feet)	Borehole Completion	Sample Type/ID	Tests	PID (ppm)	Blows/ 6"	Material Type	Description	Depth (ft)
31		S6		0.4	15 27 31			31
32								32
33								33
34								34
35		S7		0.4	16 27 31			35
36								36
37								37
38								38
39								39
40	2" SCH 40 PVC Casing	S8		0.5	18 23 31			40
41								41
42								42
43								43
44								44
45		S9		0.4	28 35 40			45
46								46
47								47
48								48
49								49
50	Hydrated bentonite chips	S10		0.4	35 50		No gravel	50
51								51
52								52
53								53
54								54
55		S11			31 50			55
56								56
57								57
58								58
59								59

Sampler Type:

- ○ No Recovery
- 3.25" OD D&M Split-Spoon Ring Sampler

PID - Photoionization Detector

- ▼ Static Water Level
- ▽ Water Level (ATD)

Logged by: MAR

Approved by: RRH

Figure No. B -

_MONITORING WELL_STIA CAR RENTAL FACILITY.GPJ August 24, 2011

Monitoring Well Construction Log

Aspect CONSULTING

Project Number	Well Number	Sheet
090134	MW-B	3 of 4

Project Name:	STIA Rental Car Facility	Ground Surface Elev	
Location:	Sea-Tac, WA	Top of Casing Elev.	
Driller/Method:	Cascade Drilling / Hollow Stem Auger, 300-lb Jars	Depth to Water (ft BGS)	84.33
Sampling Method:	D&M	Start/Finish Date	8/2/2011

Depth / Elevation (feet)	Borehole Completion	Sample Type/ID	Tests	PID (ppm)	Blows/ 6"	Material Type	Description	Depth (ft)
61		S12		0.5	20 35 41		Scattered thin silt lamina	61
62								62
63								63
64								64
65		S13			24		Trace gravel	65
66				0.5	34 39			66
67								67
68								68
69								69
70		S14			38		Slightly gravelly	70
71				0.4	50			71
72								72
73								73
74								74
75		S15			32			75
76				0.4	50			76
77	12 50-lb bags of #2/12 Monterey Sand filter pack							77
78								78
79								79
80		S16			48			80
81					50/4			81
82								82
83								83
84	▼							84
85		S17			46			85
86	2" SCH 40 PVC 10-slot screen			0.4	50/4			86
87								87
88								88
89	▽						Wet	89

Sampler Type:

- ○ No Recovery
- ◧ 3.25" OD D&M Split-Spoon Ring Sampler

PID - Photoionization Detector

- ▼ Static Water Level
- ▽ Water Level (ATD)

Logged by: MAR

Approved by: RRH

Figure No. B -

_MONITORING WELL_STIA CAR RENTAL FACILITY.GPJ August 24, 2011

Monitoring Well Construction Log

Aspect CONSULTING

Project Number	Well Number	Sheet
090134	MW-B	4 of 4

Project Name: STIA Rental Car Facility
Location: Sea-Tac, WA
Driller/Method: Cascade Drilling / Hollow Stem Auger, 300-lb Jars
Sampling Method: D&M

Ground Surface Elev:
Top of Casing Elev.:
Depth to Water (ft BGS): 84.33
Start/Finish Date: 8/2/2011

Depth / Elevation (feet)	Borehole Completion	Sample Type/ID	Tests	PID (ppm)	Blows/ 6"	Material Type	Description	Depth (ft)
91		S18		0.4	30 35 41			91
92								92
93								93
94								94
95		S19			12 15 18			95
96								96
97								97
98								98
99	Threaded PVC Endcap Sluff							99
100		S20		5.5	12 17 19		Trace gravel	100
101								101
102							Bottom of boring at 101.5' BGS	102
103								103
104								104
105								105
106								106
107								107
108								108
109								109
110								110
111								111
112								112
113								113
114								114
115								115
116								116
117								117
118								118
119								119

Sampler Type:
○ No Recovery
◧ 3.25" OD D&M Split-Spoon Ring Sampler

PID - Photoionization Detector
▼ Static Water Level
▽ Water Level (ATD)

Logged by: MAR
Approved by: RRH
Figure No. B -

_MONITORING WELL_STIA CAR RENTAL FACILITY.GPJ August 24, 2011

APPENDIX B
PORT MW-A and PORT MW-B GROUNDWATER ANALYTICAL RESULTS

Table B-1: Rental Car Facility
August 2011 Groundwater Data from New Well Locations

Chemical Name	Ground Water, Method A, Table Value (µg/L)		Ground Water, Method B, Most Restrictive Standard Formula Value (µg/L)		MW-A 08/04/11		MW-B 08/03/11	
Total Petroleum Hydrocarbons								
Gasoline Range Hydrocarbons in ug/l	800				50	U	200	
Diesel Range Hydrocarbons in ug/l	500				50	U	280	
Residual Range Organics in ug/l					250	U	250	U
Metals								
Dissolved Arsenic in ug/l	5		0.058		1	U	1	U
Dissolved Barium in ug/l			3,200		43.9		43.7	
Dissolved Cadmium in ug/l	5		8		1	U	1	U
Dissolved Chromium in ug/l	50				1.51		1	U
Dissolved Lead in ug/l	15				1	U	1	U
Dissolved Mercury in ug/l	2		4.8		0.1	U	0.1	U
Dissolved Selenium in ug/l			80		1.82		1.21	
Dissolved Silver in ug/l			80		1	U	1	U
Polycyclic Aromatic Hydrocarbons (PAHs)								
Acenaphthene in ug/l			960		0.1	U	0.1	U
Acenaphthylene in ug/l					0.1	U	0.1	U
Anthracene in ug/l			4,800		0.1	U	0.1	U
Benzo(g,h,i)perylene in ug/l					0.1	U	0.1	U
Fluoranthene in ug/l			640		0.1	U	0.1	U
Fluorene in ug/l			640		0.1	U	0.1	U
Phenanthrene in ug/l					0.1	U	0.1	U
Pyrene in ug/l			480		0.1	U	0.1	U
Naphthalene in ug/l	160		160		0.05	U	12	
Benz(a)anthracene in ug/l					0.1	U	0.1	U
Benzo(a)pyrene in ug/l	0.1		0.012		0.1	U	0.1	U
Benzo(b)fluoranthene in ug/l					0.1	U	0.1	U
Benzo(k)fluoranthene in ug/l					0.1	U	0.1	U
Chrysene in ug/l					0.1	U	0.1	U
Dibenzo(a,h)anthracene in ug/l					0.1	U	0.1	U
Indeno(1,2,3-cd)pyrene in ug/l					0.1	U	0.1	U
Volatile Organic Compounds								
1,1,1,2-Tetrachloroethane in ug/l			1.7		1	U	1	U
1,1,1-Trichloroethane in ug/l	200		16,000		1	U	1	U
1,1,2,2-Tetrachloroethane in ug/l			0.22		1	U	1	U
1,1,2-Trichloroethane in ug/l			0.77		1	U	1	U
1,1-Dichloroethane in ug/l			1,600		1	U	1	U
1,1-Dichloroethene in ug/l			400		1	U	1	U
1,1-Dichloropropene in ug/l					1	U	1	U
1,2,3-Trichlorobenzene in ug/l					1	U	1	U
1,2,3-Trichloropropane in ug/l			0.0063		1	U	1	U
1,2,4-Trichlorobenzene in ug/l			80		1	U	1	U
1,2,4-Trimethylbenzene in ug/l			400		1	U	1	U
1,2-Dibromo-3-chloropropane in ug/l			0.031		10	U	10	U
1,2-Dibromoethane (EDB) in ug/l	0.01		0.022		1	U	1	U
1,2-Dichlorobenzene in ug/l			720		1	U	1	U
1,2-Dichloroethane (EDC) in ug/l	5		0.48		1	U	1	U
1,2-Dichloropropane in ug/l			0.64		1	U	1	U
1,3,5-Trimethylbenzene in ug/l			400		1	U	4.4	

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Table B-1: Rental Car Facility
August 2011 Groundwater Data from New Well Locations

Chemical Name	Ground Water, Method A, Table Value (µg/L)		Ground Water, Method B, Most Restrictive Standard Formula Value (µg/L)		MW-A 08/04/11		MW-B 08/03/11	
1,3-Dichlorobenzene in ug/l					1	U	1	U
1,3-Dichloropropane in ug/l					1	U	1	U
1,4-Dichlorobenzene in ug/l			1.8		1	U	1	U
2,2-Dichloropropane in ug/l					1	U	1	U
2-Butanone in ug/l			4,800		10	U	10	U
2-Chlorotoluene in ug/l			160		1	U	1	U
2-Hexanone in ug/l					10	U	10	U
4-Chlorotoluene in ug/l					1	U	1	U
4-Methyl-2-pentanone in ug/l			640		10	U	10	U
Acetone in ug/l			800		10	U	10	U
Benzene in ug/l	5		0.8		0.35	U	1.3	*
Bromobenzene in ug/l					1	U	1	U
Bromodichloromethane in ug/l			0.71		1	U	1	U
Bromoform in ug/l			5.5		1	U	1	U
Bromomethane in ug/l			11		1	U	1	U
Carbon tetrachloride in ug/l			0.34		1	U	1	U
Chlorobenzene in ug/l			160		1	U	1	U
Chloroethane in ug/l			15		1	U	1	U
Chloroform in ug/l			7.2		1	U	1	U
Chloromethane in ug/l			3.4		10	U	10	U
cis-1,2-Dichloroethene in ug/l			80		1	U	1	U
cis-1,3-Dichloropropene in ug/l					1	U	1	U
Dibromochloromethane in ug/l			0.52		1	U	1	U
Dibromomethane in ug/l			80		1	U	1	U
Dichlorodifluoromethane in ug/l			1,600		1	U	1	U
Ethylbenzene in ug/l	700		800		1	U	13	
Hexachlorobutadiene in ug/l			0.56		1	U	1	U
Isopropylbenzene in ug/l			800		1	U	1	U
m,p-Xylenes in ug/l					2	U	3.4	
Methyl tert-butyl ether (MTBE) in ug/l	20		24		1	U	1	U
Methylene chloride in ug/l	5		5.8		5	U	5	U
n-Hexane in ug/l			480		1	U	1	U
n-Propylbenzene in ug/l					1	U	1	U
o-Xylene in ug/l			16,000		1	U	1	U
p-Isopropyltoluene in ug/l					1	U	1	U
sec-Butylbenzene in ug/l					1	U	1	U
Styrene in ug/l			1.5		1	U	1	U
tert-Butylbenzene in ug/l					1	U	1	U
Tetrachloroethene (PCE) in ug/l	5		0.081		1	U	1	U
Toluene in ug/l	1,000		640		1	U	1	U
trans-1,2-Dichloroethene in ug/l			160		1	U	1	U
trans-1,3-Dichloropropene in ug/l					1	U	1	U
Trichloroethene (TCE) in ug/l	5		0.49		1	U	1	U
Trichlorofluoromethane in ug/l			2,400		1	U	1	U
Vinyl chloride in ug/l	0.2		0.029		0.2	U	0.2	U
Naphthalene in ug/l	160		160		1	U	13	

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Table B-1: Rental Car Facility
August 2011 Groundwater Data from New Well Locations

Chemical Name	Ground Water, Method A, Table Value (µg/L)		Ground Water, Method B, Most Restrictive Standard Formula Value (µg/L)		MW-A 08/04/11		MW-B 08/03/11	
EDB by 8011								
1,2-Dibromoethane (EDB) in ug/l	0.01		0.022		0.01	U	0.01	U
Polychlorinated Biphenyls (PCBs)								
Aroclor 1016 in ug/l			1.1		0.1	U	0.1	U
Aroclor 1221 in ug/l					0.1	U	0.1	U
Aroclor 1232 in ug/l					0.1	U	0.1	U
Aroclor 1242 in ug/l					0.1	U	0.1	U
Aroclor 1248 in ug/l					0.1	U	0.1	U
Aroclor 1254 in ug/l			0.32		0.1	U	0.1	U
Aroclor 1260 in ug/l					0.1	U	0.1	U

Notes
*MTCA Method A and B for Benzene are both 5 µg/L in accordance with WAC 173-340-705 (5)
U - Analyte was not detected at or above the reported result.
Source : Aspect Consulting 08/24/11