

May 24, 2019

Ms. Tamara Welty, LG, LHG Washington State Department of Ecology NWRO Toxics Cleanup Program 3190 160 Avenue SE Bellevue. Washington 98008-5452

Re: **Responses to February 21, 2019 Comments** Tyee Aircraft McKechnie Group 3008 100<sup>th</sup> Street SW Everett, Washington 98204 Facility Identification Number 91865744 Cleanup Site Identification Number 1217 Voluntary Cleanup Program Project Number NW2193

Dear Ms. Welty:

RPS Group, Inc. (RPS), on behalf of Avtech Tyee, has reviewed the February 21, 2019 correspondence which provided the Washington State Department of Ecology (Ecology) opinion on the independent cleanup of the Tyee Aircraft McKechnie Group facility (Cleanup Site ID No. 1217). The Cleanup Site is located at 3008 100<sup>th</sup> Street SW, Everett, Washington ("Site"). The ECOLOGY's opinion indicated that further remedial action is necessary to clean up contamination at the Site. The ECOLOGY correspondence identified four (4) specific items in its analysis and opinion. The items identified by ECOLOGY and the RPS response (in bold italics) are provided below.

#### 1. Characterization of Site

ECOLOGY determined that characterization of the Site was insufficient to establish cleanup standards and select a cleanup action for the following reasons:

- Vertical and lateral extent of groundwater contamination needs to be fully delineated.

RPS will install additional groundwater monitoring wells at the Site. The specific additional wells are identified with the ECOLOGY comments below. A Work Plan for the additional investigation activities is provided as Attachment A.

- Lateral extent of groundwater contamination in vicinity of MW-2 needs to be delineated.

Extensive groundwater investigation has been conducted at the Site since 2010. As illustrated in the 1-year Groundwater Monitoring Program -4<sup>th</sup> Quarter 2017 summary report, shallow groundwater beneath the Site has already flowed in the northeast directions. Wells MW-1 and MW-9 are located in hydraulically downgradient areas of well MW-2. Because MW-1 and MW-9 have shown no groundwater contamination, lateral extent of groundwater contamination in the vicinity of MW-2 has been delineated. Anyway,

RPS proposes to install and sample an additional shallow groundwater monitoring well at an off-site location upgradient to cross-gradient of well MW-2 to define the



*lateral extent of groundwater impact in this area. This off-site location (like the subject Site) is located on property owned by the Snohomish County Airport (and leased to various companies). The well installation/construction methodology and the location of the proposed off-site well is presented in Attachment A.* 

- Vertical extent of vinyl chloride groundwater plume has not been adequately delineated.

Deep well MW-7 was installed to determine the vertical extent of solvent contamination in the site groundwater, according to an Ecology-approved work plan in 2014. Well MW-7 is in the down-gradient area of MW-4 where solvent-contaminated groundwater was detected. Additionally, this well is located in the general vicinity of one of the two source areas of solvent soil contamination.

As requested, a deep monitoring well (similar in installation and construction to well MW-7) will be installed and sampled at an on-site location adjacent to well MW-3 to delineate the vertical extent of vinyl chloride impacts at the Site. This proposed location is within the boundaries of the Site and is illustrated in Attachment A.

 Extent of trichloroethene (TCE) contaminated soil beneath the southern portion of the building has not been delineated to the northwest.

RPS feels that the extent of TCE impacted soil within the building (specifically, northwest of the former oil storage room) has been delineated by soil samples collected from 5 to 7 feet below ground surface (bgs) in borings GP-21, GP-24, GP-27, and T-11. Additionally, TCE is not present in shallower soils within boring locations GP-25, GP-26, GP-28, and GP-29. The non-impacted soil locations are approximately 90 to 120 feet from boring location GP-7, but the areas in between GP-7 and the other locations are currently covered by pavement and/or the foundation of the Site building. AvtechTyee intends to use the paved surfaces and building foundation as engineered controls to maintain compliance with cleanup standards (in accordance with ECOLOGY guidance).

AvtechTyee and RPS do understand that ECOLOGY may request that additional borings be advanced and sampled within the building (in the vicinity of GP-7) to provide a more conservative delineation of TCE impacted soil, but that may not be necessary.

 Additional information is needed regarding the septic system in the western portion of the property that was found to contain water with a vinyl chloride concentration of 3.9 micrograms per liter (µg/L).

The septic system connections at the Site will be traced using a video camera system (from a local plumbing contractor). The camera tracing will be utilized to identify drains, pipes, and other connections that lead to the septic tank. Additionally, RPS and the plumbing contractor will attempt to determine the construction of the septic tank and lines. RPS will also identify the frequency of septic system cleanout and the location utilized for disposal of septic system wastes.

– Please document the locations of the drains and pipes that lead to the septic tank.

As indicated above, RPS will retain a local plumbing contractor to conduct a video inspection of the septic system drains and connection lines to determine locations of these connections.

Ms. Tamara Welty, LG, CHG May 24, 2019



 A vapor intrusion evaluation must be conducted in accordance with Ecology's Draft Guidance for Evaluating Soil Vapor Intrusion in Washington State: Investigation and Remedial Action, Revised April 2018.

In 2009 and 2010, two rounds of air sampling were conducted at the Site. Additional evaluation of the indoor and outside air quality data was presented in a document submitted to Ecology on March 28, 2014. The results of the indoor air samples did not indicate VOC concentrations over MTCA criteria, with the exception of benzene. However, benzene has not been detected in soil or groundwater sampling conducted to date and is not considered a COC for the Site. Outdoor air sampling results also indicated the presence of benzene and several other constituents, most of which were also not detected in soil and groundwater samples. It is noteworthy that TCE and vinyl chloride were reported as "not detected" in the indoor air samples. Furthermore, cis-1.2.-DCE was not detected in the two samples collected on the first floor (warehouse and downstairs office). Cis-1,2,-DCE was noted in the indoor air sample from the upstairs office at a concentration of 1.9 ug/m3, below the applicable MTCA cleanup level of 16 ug/m3. This information suggests the air guality in the facility is generally consistent with ambient background concentration and the data does not suggest a significant contribution to indoor air degradation. The air sampling was completed before Draft Guidance for Evaluating Soil Vapor Intrusion in Washington State was developed.

As discussed during a conference call among representatives from Ecology, Avtech Tyee, and RPS on April 23, 2019, RPS compared the previous air data against the current MTCA standards. A review of the 2009 indoor air data identified benzene and 1,4-dichlorobenzene at concentrations exceeding the Indoor Air Method B Cancer Cleanup Levels. Additionally, the laboratory detection limits for TCE in the three indoor air samples exceeded the Indoor Air Method B Non-Cancer and Cancer Cleanup Levels. Thus, to meet the current standards required by Ecology, the investigation activities proposed in this response letter include a Tier II vapor intrusion investigation within the building footprint.

The planned vapor intrusion investigation will include the collection of sub-slab soil gas samples at locations adjacent to sample locations which had exhibited impacted soil and groundwater. The proposed sub-slab soil gas samples will be collected in accordance with the requirements of <u>Guidance for Evaluating Soil Vapor Intrusion in</u> <u>Washington State: Investigation and Remedial Action</u> (ECOLOGY 2018). The results of the sub-slab analyses will be evaluated against the current sub-slab soil gas screening levels. The proposed sub-slab soil gas sample point locations are presented in Appendix A. Appendix B presents the sub-slab soil gas sampling methodology.

### 2. Establishment of Cleanup Standards

ECOLOGY determined that the cleanup levels and points of compliance established for the Site do not meet the substantive requirements of the Model Toxics Control Act (MTCA) based on the following:

 Cleanup levels for vinyl chloride, cis-1,2-dichloroethene, TCE, and total petroleum hydrocarbons should be based upon unrestricted land use.



The Site is currently utilized as the Washington Aerospace Training & Research Center (WATR) managed by Edmonds Community College. Although the training performed at the Site include typical aerospace manufacturing activities, the Site is not a traditional industrial property (under the definition established in Washington Administrative Code Title 173 Chapter 340, Sections 200 [WAC 173-340-200]). Therefore, the determination as to whether the Site should be designated as an industrial property relies on the criteria promulgated in WAC 173-340-745. WAC 173-340-745(1)(a)(i)(B) indicates that the general public is not generally allowed at industrial properties. At the Site, public roadways border the Site on the north and west and there are no security fences surrounding the Site. WAC 173-340-745(1)(a)(i)(E) indicates that the land surface at industrial properties is often covered by buildings or pavement to minimize potential exposure to soil. At the Site, solventsimpacted soil has been identified within the lawn area present along the west side of the building. Additionally, prior to remediation activities performed at the Site, petroleum impacted soil had been identified within the lawn area present on the east side of the Site.

Thus, as the general public can access the Site and there is a potential exposure to impacted soils, the Site does not warrant designation as industrial property. Therefore, the cleanup levels for the Site should be based upon unrestricted land use.

 Reporting should indicate whether the established points of compliance are standard or conditional and provide the rationale for this determination (or request if a conditional point of compliance is indicated).

Future reports provided to ECOLOGY will establish whether points of compliance for soil and groundwater are standard or conditional (based upon the criteria established in WAC 173-340). The specific points of compliance will be established and identified for each analyte exhibiting exceedances of promulgated cleanup levels.

#### 3. Selection of Cleanup Action

As indicated above, the cleanup levels and points of compliance do not meet the substantive requirements of MTCA. Therefore, the cleanup action selected for the Site does not meet the substantive requirements of MTCA.

Subsequent to the completion of additional investigative/delineation activities, points of compliance will be established for the Site. Cleanup actions that remediate the impacts present in media at the Site will be evaluated. Appropriate cleanup actions will be identified to ensure to compliance with cleanup levels established for the Site. The selected cleanup action(s) will be provided in a report to ECOLOGY for Agency review and opinion.

### 4. Cleanup

ECOLOGY has determined that the cleanup performed at the does not meet the cleanup standards at the Site for the following reasons:

 Post-injection soil confirmatory sampling has not been conducted in the TCE impacted soil area (in which zero-valent iron was injected).

As part of the additional investigation activities to be conducted at the Site, RPS will perform confirmatory sampling in the TCE impacted soil area to determine the



efficacy of the zero valent iron injections. RPS will advance three (3) soil borings at each TCE "hot spot" at the Site. Confirmatory soil samples will be collected at depths corresponding to the depths of previously identified TCE impacts in soil and/or from depth intervals which exhibit elevated VOC headspace readings, staining, or odors. Headspace measurements will be obtained using a photoionization detector to qualitatively measure VOC readings in soils. RPS will collect two soil samples from each boring. All collected soil samples will be analyzed for VOCs at a State-accredited environmental laboratory. The results of the confirmatory soil sampling will be reported to ECOLOGY.

 Groundwater concentrations of vinyl chloride suggest to ECOLOGY that the concentrations are unlikely to decrease below the MTCA cleanup levels within a reasonable restoration period. The use of monitored natural attenuation as a sole remedial method is not sufficient and ECOLOGY requires further action to achieve compliance with cleanup standards.

Subsequent to the completion of additional investigation/delineation and groundwater monitoring activities, RPS will evaluate appropriate remedies to address groundwater impacts which may remain at the Site. Should impacts exceed the established groundwater cleanup levels, RPS will evaluate potential groundwater remedial strategies to determine the appropriate method to reduce analyte levels to concentrations below MTCA cleanup levels or to levels under which an environmental covenant (and continued groundwater monitoring) are an appropriate remedial alternative.

The cessation of groundwater monitoring once stable and decreasing trends in analyte concentrations are identified does not satisfy ECOLOGY requirements. ECOLOGY requires that groundwater monitoring be continued until groundwater sample concentrations are below MTCA cleanup levels (even if a decreasing trend is identified). Groundwater monitoring can only be eliminated if MTCA cleanup levels are met and compliance is confirmed (typically 4 to 8 quarters of groundwater analyte levels below MTCA levels). Additionally, if impacted groundwater is still present at the Site and an environmental covenant is implemented, continued groundwater monitoring would be required.

As indicated above, subsequent to additional investigation/delineation activities and groundwater monitoring planned for the Site, the applicable cleanup levels for the Site will be determined and a remediation strategy to address groundwater impacts will be identified (and discussed with ECOLOGY). Upon determination (by approval or opinion) from ECOLOGY that the identified remedial alternative(s) are appropriate to address groundwater impacts which may be present at the Site, RPS will implement the remediation and conduct subsequent groundwater monitoring to determine whether the applicable cleanup levels have been satisfied. Additionally, RPS will evaluate whether the implementation of an environmental covenant and regular groundwater monitoring are warranted by the remediation results.

Additional comments provided by ECOLOGY in the February 2019 correspondence regarded tabulation of field investigation data reporting, analytical results, report figures, and report preparation. These comments are appropriate and acceptable to RPS. The changes required by these comments, as requested by ECOLOGY, will be incorporated into all future reporting.

Ms. Tamara Welty, LG, CHG May 24, 2019



The proposed delineation/investigation scope of work is provided in Attachment A. A map of the proposed investigation locations is included in the attachment.

Should you require any further information or clarification, please do not hesitate to contact me. Thank you for your assistance with this project. We look forward to working with you.

Yours sincerely, for RPS Group, Inc.

John H. Yang, PG Senior Vice President, Site Investigation & Remediation john.yang@rpsgroup.com +1 312 262 4330

Patrick Hook, LPG WA License No. 3299

Encl.

Appendix A Additional Delineation Locations

Appendix B Additional Investigation/Delineation Methodology



# Appendix A

**Additional Delineation Locations** 











LEGEND



# Appendix B

Additional Investigation/Delineation Methodology



## **Confirmatory Soil Sampling**

RPS will obtain confirmatory soil samples from the two (2) zero valent iron injection locations (near borings GP-7 and GP-12) at the Site. The confirmatory samples will be utilized to evaluate the effectiveness of the zero valent iron injection in reducing the TCE concentrations in soil at these two (2) contaminated soil locations.

Prior to the initiating boring and sampling activities, RPS will ensure utilities are not present at the proposed boring locations by performing a ground penetrating radar (GPR) survey of the proposed locations. After utilities clearance of the areas, confirmatory soil boring and sampling activities will commence.

The proposed drilling activities will include the installation of three (3) confirmatory soil boings in each of the former remedial area hot spots (locations GP-7 and GP-12). The proposed confirmatory soil sampling locations are illustrated in Attachment A. Confirmatory soil samples will be collected at a depth corresponding to the depths of previously identified soil impact or at areas with any elevated PID readings, staining or odors. All soil samples will be analyzed for volatile organic compounds (VOCs). To ensure data quality for future submittal to the ECOLOGY, quality control samples will include a duplicate, trip blank and matrix spike/matrix spike duplicate (MS/MSD) samples.

After receipt of laboratory analytical reports, the confirmatory soil sample analytical results will be compared to the applicable ECOLOGY cleanup levels, as outlined in the MTCA, to determine whether any residual TCE impacts remain within the limits of the treatment area. Should the samples results identify any residual impacts in the soils within the treatment area limits, RPS will address the impacts by potential additional remedial measures or by using a risk-based approach (in accordance with MTCA guidance).

Upon completion of the confirmatory soil sampling activities, RPS will prepare a letter report summarizing the on-site activities and confirmatory soil sampling results. The report will include figures depicting the location of the confirmatory soil borings and a table summarizing the analytical data with comparison to ECOLOGY cleanup levels.

## **Monitoring Well Installation and Sampling**

RPS will install two (2) additional groundwater monitoring wells at the Site. A shallow well (identified as well MW-10) will be installed at an off-site location, west of well MW-2. A deep monitoring well (identified as well MW-11) will be installed in the vicinity of well MW-3. These wells will be installed and sampled to delineate identified groundwater contamination at the Site. The shallow off-site well will be utilized to laterally delineate groundwater VOC plume at well MW-2. The deep monitoring well will be installed in the vicinity of current shallow monitoring well MW-3 and will be utilized to vertically delineate the extent of VOCs (particularly vinyl chloride) in groundwater at this location. The proposed locations of the additional wells are illustrated in Attachment A.

Groundwater at the Site is present in occasional perched and laterally discontinuous zones within the upper portions of the Vashon Till unit which underlies the Site. The intent of proposed well MW-10 is to further evaluate the lateral extent of the groundwater contamination identified at well MW-2. Wells MW-2 is screened and sand packed over the shallow interval which extends from approximately 8 to 15 feet bgs. Accordingly, it is anticipated that well MW-10 will be set to a similar depth (estimated in range of 8 to 20 feet bgs). The specific depth will be dependent on field conditions.

Ms. Tamara Welty, LG, CHG May 24, 2019



Proposed well MW-11 is being installed to further evaluate the vertical extent of the groundwater contamination (particularly vinyl chloride) near well MW-3. The sand pack for MW-3 extends from approximately 8 to 15 feet bgs. Accordingly, as MW-11 will be a deep well, it is anticipated that MW-11 will be double cased (using a temporary conductor casing of 10.5" hollow stem auger) and set to a deeper depth (estimated in range of 40 to 50 feet bgs). The specific depth will be dependent on field conditions.

Prior to conducting the drilling/well installation activities RPS will contact the Washington Call Before You Dig utility locating service to have utilities in the area marked. A non-invasive, GPR survey of the proposed well locations will also be conducted prior to drilling to assess for anomalies suggestive of unmarked utilities.

The borings for the proposed permanent monitoring wells will be advanced at the Site using a Geoprobe® drill rig equipped with augers or a hollow stem auger drill rig. Soil samples will be collected on a continuous basis to determine soil types. Field screening of soil samples for VOCs will be performed using a PID. A single soil sample will be collected from depth in these borings. The samples will be placed in laboratory-supplied containers and shipped to an ECOLOGY-accredited analytical laboratory following standard chain-of-custody procedures. These soil samples will be submitted to a laboratory and analyzed for VOCs using United States Environmental Protection Agency (USEPA) Methods 5035/8260. The laboratory will be requested to obtain a Practical Quantitation Limit (PQL) of 0.2 ug/L for vinyl chloride (Note: This is the ECOLOGY Method A Cleanup Level for this constituent).

Upon reaching termination depth, a 2-inch diameter polyvinyl chloride (PVC) groundwater monitoring well will be installed at each location. The wells will include a 5- or 10-foot length of 0.010" slotted manufactured screen (length dependent on soil types present). The annular space around the screened interval will be filled with a sand filter pack. The remaining annular space will be sealed with bentonite. Each well will be finished with a steel protector casing concreted into place.

Well development will consist of the removal of water from the well using a submersible pump with groundwater pumped to remove drilling sediments and fines. The new monitoring wells will be allowed to stabilize prior to the collection of groundwater samples.

The new and existing monitoring wells will be surveyed by a licensed surveyor and top-of-casing elevations will be obtained relative to a nearby North American Vertical Datum of 1988 (i.e., NAVD88).

A set of groundwater samples will be collected from the existing and new monitoring wells (MW-1 though MW-11). The samples will be collected using low-flow techniques. As part of the groundwater sample collection, the permanent monitoring wells will be purged until physicochemical parameters (dissolved oxygen, oxidation-reduction potential, pH, conductivity, turbidity, and temperature) stabilize. The permanent wells will then be sampled using low flow methodology and dedicated tubing. The samples will be placed in laboratory supplied containers and shipped to an ECOLOGY-accredited laboratory following standard chain-of-custody procedures. The samples will be analyzed for VOCs using USEPA Method 8260. The laboratory will be requested to obtain a Practical Quantitation Limit (PQL) of 0.2 micrograms per liter for vinyl chloride (as this is the ECOLOGY Method A Cleanup Level for this constituent).

The methods and results of the well installation and sampling activities will be submitted in a letter report to the ECOLOGY. The analytical results will be compared to the applicable cleanup levels as outlined in the MTCA. The report will describe the methods and results of the additional well

Ms. Tamara Welty, LG, CHG May 24, 2019



installation and groundwater sampling. The report will include a soil boring location plan, a table summarizing the analytical data relative to comparison criteria, copies of boring logs, and copies of the laboratory reports.

## **Septic System Line Inspection**

RPS proposes an inspection of the septic system (including drains and lines) at the Site. RPS will retain a licensed plumbing contractor to inspect the septic system drains, lines, and tank with a closed-circuit television (CCTV) camera. The system will be inspected to determine the construction material, identify drains and inputs to the septic system and identify any cracks or leaks in the system. The CCTV camera inspection will also trace the path of the system lines. The location of any leaks will be noted for later investigation.

Upon completion of the CCTV inspection, RPS will provide a summary of the findings for inclusion within reports provided to ECOLOGY.

## Sub-Slab Soil Gas Sampling

The planned vapor intrusion investigation shall include the collection of sub-slab soil gas samples at locations adjacent to sample locations which had exhibited impacted soil and groundwater. Specifically, sub-slab soil gas sample points will be installed adjacent to boring locations GP-7 and GP-12 and well locations MW-2, MW-3, and MW-4. RPS will install five (5) sub-slab vapor probes (identified as sample locations SS-1 through SS-5) within the Site building using VaporPin® methodology. All sub-slab soil gas sampling will be performed in accordance with the methodology and requirements of *Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air* (USEPA 2015) and *Guidance for Evaluating Soil Vapor Intrusion in Washington State: Investigation and Remedial Action* (Ecology 2018).

Vapor Pins® will be installed through small diameter holes cored through the concrete floors of the building. After installation of the Vapor Pins®, each sample point will be evacuated (to remove ambient air) and the sampling installation will be leak tested (to evaluate whether ambient air is entering the sub-slab zone). Subsequent to the evacuation and leak tests, the sub-slab soil gas sample will be collected using a one-liter stainless steel passivated canister. RPS will record the canister pressure at the initiation and the completion of the sampling. The canister will remain open (to collect a sample) for 30 minutes or until just prior to the canister pressure reaching zero (whichever comes first). The collected soil gas samples will be analyzed for VOCs using USEPA Method TO-15. The sub-slab soil gas samples will be properly preserved and labeled. The samples will be shipped to a Washington-accredited environmental laboratory under standard chain-of-custody protocol. Upon completion of the sampling activities, the Vapor Pins® will be removed, and the surface will then be restored to its original condition, to the extent possible. The results of the sub-slab analyses will be evaluated against the current sub-slab soil gas screening levels.