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STATE OF WASHINGTON DEPARTMENT OF ECOLOGY

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April 23, 2021

John Robbins Shell Environmental Program Manager Shell Oil Products US 1511 N. Convent 700-293 Bourbonnais, IL 69904 (john.robbins@shell.com)

Re: Comments on Cleanup Updates for the following Hazardous Waste Site:

- Site Name: Shell Oil Co NW Market St
- Site Address: 803 NW Market Street, Seattle, WA 98107
- Facility/Site No.: 26173437
- Cleanup Site ID: 5781
- VCP Project No.: NW2048

Dear John Robbins:

The Washington State Department of Ecology (Ecology) received your recent cleanup updates at the Shell Oil Co NW Market St facility (Site). AECOM, on behalf of Shell Oil Products US (Shell), provided these recent cleanup updates in the following submittals and correspondences:

- 1. AECOM, *Response to Comments, 803 NW Market Street, Seattle, WA 98107*, January 6, 2021 (referred to as *January 6 Response Letter* hereafter).
- 2. AECOM, *Response to Opinion Letter*, 803 NW Market Street, Seattle, WA 98107, January 29, 2021 (referred to as *January 29 Response Letter* hereafter).
- 3. AECOM, *Email Correspondence: 803 NW Market St Access Agreements Update*, March 15, 2021 (referred to as *March 15 Email Correspondence* hereafter).
- 4. AECOM, *Email Correspondence: RE: 803 NW Market St Access Agreements Update*, March 22, 2021 (referred to as *March 22 Email Correspondence* hereafter).
- 5. AECOM, *Email Correspondence: RE: 803 NW Market St Access Agreements Update*, March 23, 2021 (referred to as *March 23 Email Correspondence* hereafter).

These cleanup updates are provided in response to Ecology's following letters:

- 1. Ecology, *Re: Request for Evaluation of Petroleum Vapor Intrusion Risks at the following Site, Shell Oil Co NW Market St, 803 NW Market Street, Seattle, WA 98107, Facility No 26173437, VCP NW2048*, November 6, 2020 (referred to as *November 2020 VI Opinion Letter* hereafter).
- Ecology, Opinion pursuant to WAC 173-340-515(5) on Remedial Action at the following Hazardous Waste Site, Shell Oil Co NW Market St, 803 NW Market Street, Seattle, WA 98107, Facility No 26173437, VCP NW2048, December 2, 2020 (referred to as December 2020 Opinion Letter hereafter).

Ecology appreciates your timely response to our letters.

Ecology has reviewed the cleanup updates provided in the aforementioned submittals and correspondence, and also reviewed the following document that was previously provided to Ecology:

AECOM, Third Addendum to the Additional Subsurface Investigation Work Plan dated May 3, 2017, Former Shell-Branded Service Station, 803 NW Market Street, Seattle, WA, September 8, 2020 (referred to as September 2020 Work Plan hereafter).

Based on the review, Ecology provides the following comments to your cleanup updates. We are providing the comments under the authority of the Model Toxics Control Act (MTCA), Chapter 70A.305 RCW.

1. Recent Updates on Vapor Intrusion (VI) Assessment and Ecology's Comments.

Ecology's *November 2020 VI Opinion Letter* requested a Tier II petroleum vapor intrusion (PVI) assessment, which included concurrent and comprehensive sampling of multiple indoor air sampling locations, multiple sub-slab soil gas sampling locations, and at least one outdoor air sampling location.

Recent Updates:

- AECOM submitted the *January 6 Response Letter* in response to the *November 2020 VI Opinion Letter*. The *January 6 Response Letter* proposed to conduct sub-slab soil gas sampling first, while "indoor air sampling is being considered in a stepwise approach, due to the likelihood of contributions from external, nearby sources".
- The January 6 Response Letter included an updated table to summarize the sub-slab soil

vapor analytical data collected to date, and a Sampling and Analysis Plan (SAP).

- The *January 6 Response Letter* proposed to install sub-slab vapor pins inside the buildings at each proposed sub-slab sampling location (location #13 through #23 on **Figure 1**). In the *March 15 Email Correspondence*, AECOM additionally proposed to install soil vapor probes for some of the residential properties at alternative locations outside of the buildings (location #13A, 15A through 23A on **Figure 1**). A soil vapor probe construction detail was also provided in the *March 15 Email Correspondence* (**Figure 2**).
- The *March 23 Email Correspondence* indicated that installing sub-slab vapor pins is still the preference, with the soil vapor probes as an alternative. Soil vapor probes will be installed at alternative locations, if there are obstructions within the building structures (unknown at this point), or if the residents are not willing to have a soil vapor pin installed in their floor.
- The *March 15 Email Correspondence* also indicated that access agreement requests have been sent out to the neighboring properties. In addition, the *March 23 Email Correspondence* confirmed that access agreements for the 803 NW Market Street (the Property), and two neighboring properties west and south of the Property, are already in place.

Ecology's Comments on the Recent Updates:

- Ecology appreciates your effort on obtaining access to the Property and nearby properties, as it is a necessary step for completing sufficient Site characterization and cleanup. Please continue to communicate with Ecology throughout the access agreement negotiation process. Ecology is willing to provide assistance if needed.
- Ecology concurs with your approach of conducting the sub-slab soil sampling first. Ecology requests that the proposed sub-slab soil gas sampling be conducted within 60 days of receipt of this letter.
- If significant delays occur associated with obtaining access agreements on some neighboring properties, please notify Ecology and demonstrate to the satisfaction of Ecology that a schedule extension is needed. At the same time, the sub-slab soil sampling should still move forward on the Property and nearby properties where access agreements are already in place, within 60 days of the receipt of this letter.
- <u>Indoor air sampling is necessary if exceedance of MTCA screening level is confirmed in sub-</u><u>slab soil samples.</u>

If concentrations of any of the contaminants of concern (COC) in the sub-slab soil gas

samples exceed the MTCA Method B sub-slab soil gas sample screening levels¹, indoor air sampling should be immediately conducted in the building(s) where exceedance(s) are confirmed in the sub-slab soil gas sample(s).

Ecology requests submittal of an indoor air sampling SAP within 60 days of receipt of a subslab soil gas sampling data that exceed the Method B screening levels.

• Ecology appreciates the submittal of an updated sub-slab soil vapor analytical data table, and a SAP.

Section 2.10 of the SAP provides a list of analytes for the sub-slab soil gas samples.

Only benzene, toluene, ethylbenzene, xylene (BTEX) and naphthalene are included in the proposed volatile organic compounds (VOC) analyses. However, multiple other VOCs, including n-hexane and 1,2,4-trimethylbenzene (1,2,4-TMB), were historically detected at concentrations above the MTCA Method B sub-slab soil gas screening levels in the previous sub-slab soil gas samples.

Ecology requests inclusion of a full list of VOC analyses per Method TO-15 in the analytical list for the sub-slab soil gas samples.

• Ecology concurs with the alternative sampling locations, if the building structures do not permit appropriate sub-slab sampling locations, or if the residents do not allow sub-slab vapor pins installed in their building floors.

<u>Please submit a written list and a map that shows the properties where sub-slab soil gas</u> sampling will be conducted at the alternative locations, with the reasons for choosing the alternative locations, prior to initiating the sub-slab soil gas sampling.

- Ecology concurs with the soil vapor probe construction detail that was included in the *March 15 Email Correspondence*. It is important to install the screens of the soil vapor probes at least 5 feet below ground surface (bgs) in accordance with Ecology's guidance².
- Please provide a diagram showing the proposed construction details of a typical sub-slab vapor pin.
- 2. Recent Updates on Soil and Groundwater Characterization and Ecology's Comments.

¹ Ecology, Cleanup Levels and Risk Calculation (CLARC), Data Table for Vapor Intrusion: Method B; CLARC Excerpt (February 2021): Vapor intrusion Method B table (wa.gov)

² Ecology, Draft Guidance for Evaluating Soil Vapor Intrusion in Washington State: Investigation and Remedial Action, Publication No. 09-09-047, October 2009, Revised February 2016 and April 2018; <u>0909047.pdf (wa.gov)</u>

Previously, AECOM submitted the *September 2020 Work Plan* and proposed to install additional monitoring wells (locations #1 through #9 on **Figure 3**). Ecology reviewed the *September 2020 Work Plan* and issued the *December 2020 Opinion Letter*, which requested additional soil and groundwater characterization and interim cleanup action.

Recent Updates:

- AECOM submitted the *January 29 Response Letter* in response to Ecology's *December 2020 Opinion Letter*. The *January 29 Response Letter* proposed additional monitoring wells (locations #10 though #12 on Figure 3).
- AECOM proposed a groundwater sampling program in the *March 22 Email Correspondence*. The proposed sampling program includes gauging all monitoring wells and no-purge sampling of new monitoring wells quarterly, no-purge sampling of the existing monitoring wells annually, and no sampling of selected existing monitoring wells. The sampling program is illustrated with color coding on **Figure 3**.
- The *January 29 Response Letter* indicated that interim actions are being considered. A limited excavation of impacted soil in the northern portion of the Property is currently being considered to address the light non-aqueous phase liquid (LNAPL) plume that is observed in monitoring well MW-14. Additionally, options are being considered for the plume observed in the southwestern portion of the Property.
- The *December 2020 Opinion Letter* requested analysis of required waste oil parameters on selected monitoring wells, per WAC 173-360-900, Table 830-1. The *January 29 Response Letter* proposed to analyze groundwater samples from monitoring wells MW-8, MW-11, MW-16, and MW-35 for carcinogenic polycyclic aromatic hydrocarbons (cPAHs), polychlorinated biphenyls (PCBs), and halogenated volatile organic compounds (HVOCs).

Ecology's Comments on the Recent Updates:

- Ecology concurs with the newly proposed monitoring well locations #11 (at the condominium complex) and #12 (at 815 NW Market Street).
- Ecology recommends moving the newly proposed monitoring well location #10 east or southeast of monitoring well MW-27.

The purpose of this monitoring well is to delineate the eastern boundary of the contamination, and evaluate the potential northeasterly component of groundwater flow. If subsurface or overhead obstruction exists to prevent a monitoring well installation, please communicate with Ecology and work with Ecology to find an alternative location.

• <u>Ecology recommends moving the proposed monitoring well location #1 further east, close to</u> <u>soil vapor probe VP-1.</u>

The purpose of this monitoring well is to assess groundwater conditions immediately north of the building on the Property, where exceedances of MTCA Method B sub-slab soil gas screening levels were confirmed in soil vapor probe VP-1. This monitoring well can also further delineate the LNAPL plume that is observed in monitoring well MW-14.

This new monitoring well will replace monitoring well MW-10. Monitoring well MW-10 should be properly decommissioned in accordance with WAC 173-160-460. The reason for decommissioning monitoring well MW-10 is further discussed below.

• Currently, a total of 29 monitoring wells are present at the Site. Among them, seven monitoring wells (MW-7 through MW-13) are "intermediate screened" (from approximately 25 to 30 feet bgs); the others are "shallow screened" (from 5 to 15 bgs or similar). Regardless of the screened intervals, the depths to groundwater measured in all monitoring wells are between 5 and 12 feet bgs.

The September 2020 Work Plan indicated that the "shallow screened" and "intermediate screened" monitoring wells "are both completed within the same apparent glacial till unit, with no distinct aquitard patterns observed consistently throughout, but are evaluated separately." It is Ecology's opinion that the absence of an aquitard indicates that these monitoring wells are screened at the same water-bearing zone.

Ecology reviewed the groundwater analytical data from all "intermediate screened" monitoring wells (MW-7 through MW-13). All these monitoring wells contain groundwater COC concentrations below the MTCA Method A groundwater cleanup levels for more than four consecutive quarters.

Ecology recognized that some of these "intermediate screened" monitoring wells are located in close proximity of some "shallow screened" monitoring wells. In multiple locations, the "intermediate screened" monitoring wells demonstrate "clean" data, while the nearby "shallow screened" monitoring wells are either confirmed with LNAPL presence, or exceedances of MTCA Method A groundwater cleanup levels in dissolved phase.

For example, "intermediate screened" monitoring well MW-11 is located immediately next to "shallow screened" monitoring well MW-16. Monitoring well MW-16 consistently contained concentrations of gasoline- and diesel-range petroleum hydrocarbons (TPHd and TPHo), BTEX, and naphthalenes above the MTCA Method A groundwater cleanup levels; however, monitoring well MW-11 did not contain COC concentrations above the MTCA Method A groundwater cleanup levels since 2013. The data suggested that the "intermediate screened" monitoring wells may not provide representative groundwater quality data due to their submerged screens.

Therefore, it is Ecology's opinion the appropriate screened intervals for Site groundwater should be the "shallow screened" intervals. All proposed monitoring wells should be

screened at the "shallow" intervals and straddle the seasonal depth to groundwater, as indicated in the *December 2020 Opinion Letter*.

Because the "intermediate screened" monitoring wells do not appear to provide representative data, while potentially creating a vertical conduit for groundwater contamination, <u>Ecology recommends properly decommissioning the "intermediate screened" monitoring wells (MW-7 through MW-13) in accordance with WAC 173-160-460.</u>

• Ecology recommends installing a replacement well with appropriate screened interval for "intermediate screened" monitoring well MW-8.

This recommendation is based on a review of the "intermediate screened" monitoring well locations, and the presence/absence of an appropriate screened ("shallow screened") monitoring well in close proximity.

The replacement well for monitoring well MW-8 with appropriate screened interval can help delineate the eastern boundary of the LNAPL plume that is observed in monitoring wells MW-23, MW-32, MW-36, and MW-37.

Soil samples should be collected during the well installation to at least 25 feet bgs, because soil contamination was historically observed in the MW-8 well boring at 15 and 20 feet bgs. Further soil sampling may be needed to fully assess the vertical extent of soil contamination.

• Ecology's *December 2020 Opinion Letter* requested further evaluation of groundwater flow directions. The *January 29 Response Letter* provided the following explanation on the variation of groundwater flow:

"Historically presented groundwater contour maps did not consider differences in the "shallow screened" and "intermediate screened" groundwater intervals noted by AECOM, with resulting implications for indicated groundwater flow. Please see discussion of hydrogeology provided in the Work Plan [September 2020 Work Plan], as well as its included figures for recent examples of the separate intervals, with further consideration to additionally include the proposed well locations."

Ecology reviewed the recent groundwater contour maps included in the *September 2020 Work Plan*. Figure 9, 11, and 13 of the *September 2020 Work Plan* depicted the recent contour maps for the "shallow screened" monitoring wells. All these maps show a general flow to the south-southeast, with components to the southwest and northeast. Variation in groundwater flow is observed mainly on the northern portion of the Property.

<u>Please submit a Rose diagram showing the groundwater flow directions after additional</u> <u>monitoring wells are installed and groundwater elevation data are collected.</u> The Rose diagram should include all historical groundwater flow directions based on groundwater elevation data from all monitoring wells that are screened at appropriate intervals.

- Ecology reviewed the proposed groundwater sampling program in the *March 22 Email Correspondence*, and <u>recommends the following changes to the groundwater sampling plan</u> during the current cleanup stage:
 - All monitoring wells should be measured with depths to groundwater, and/or LNAPL thickness, on a quarterly basis.
 - All new monitoring wells should be sampled on a quarterly basis, if LNAPL is not present in the well. These wells include proposed monitoring wells on locations #1 through #12 and the replacement well for MW-8.
 - Existing "shallow screened" monitoring wells with LNAPL should be sampled if LNAPL is absent. These wells include monitoring wells MW-14, MW-23, MW-32, MW-36, and MW-37.
 - A majority of the "shallow screened" monitoring wells can be sampled on a <u>semi-annual</u> basis. Groundwater samples should be collected approximately 6 months apart, representative of both high and low groundwater conditions. These wells include monitoring wells MW-15 through MW-19, MW-21, MW-26, MW-27, and MW-33 through MW-35.
 - Some existing "shallow screened" monitoring wells, with groundwater COC concentrations below the MTCA Method A groundwater cleanup levels since installation, are likely located outside of the estimated plume extent and do not need to be sampled. These wells include monitoring wells MW-20, MW-22 and MW-24.
 - As stated above, the existing "intermediate screened" monitoring wells will be decommissioned and do not need to be sampled again. These wells include monitoring wells MW-7 through MW-13.
- Ecology does not concur with no-purge groundwater sampling that is proposed in the *March* 22 Email Correspondence.

Based on Ecology's guidance³, "use of no flow/no purge sampling methods is not recommended without comparative data from several wells at the site demonstrating the method will provide representative samples under the conditions present at the site." In addition, Ecology's guidance suggests that low-flow sampling should be used in groundwater sampling.

Site groundwater should be sampled using low-flow sampling method with purging.

³ Ecology, *Guidance for Remediation of Petroleum Contaminated Sites, Publication No. 10-09-057*, Revised June 2016; <u>04130394.TEX [TEX] (wa.gov)</u>

Groundwater should be purged until indicator parameters (such as specific conductance, pH, dissolved oxygen and redox potential) have stabilized, prior to when samples are collected. A bailer should not be used for sampling as the transfer process can result in loss of volatile compounds.

• <u>The groundwater sampling plan should be revised after additional cleanup action is conducted.</u>

For example, after the interim cleanup actions are conducted, the groundwater monitoring plan should be revised so the effectiveness of the interim actions can be assessed.

Ecology recommends inclusion of an updated groundwater monitoring plan in an interim action work plan and/or an interim action report.

• Ecology concurs with the proposed analysis (cPAHs, PCBs, and HVOCs) for monitoring wells that are located close to the former waste oil underground storage tank (UST). Ecology recommends conducting the proposed analysis for monitoring wells MW-16, MW-34, and MW-35, and the replacement well for monitoring well MW-8.

This recommendation is based on a review of the historical service station layout, the locations and screen intervals of the monitoring wells, and LNAPL presence. Depending on the analytical results from these monitoring wells, waste oil analysis on other monitoring wells may be needed.

• Monitoring wells MW-17 through MW-37 have not been analyzed for dissolved lead since installation. Lead is a required analysis for gasoline and waste oil releases per WAC 173-340-900, Table 830-1.

Ecology recommends dissolved lead analysis for monitoring wells MW-17 through MW-37, as well as the new monitoring wells for at least once (except monitoring wells MW-20, MW-22 and MW-24).

Depending on the analytical results, additional lead analysis may be needed.

3. Ecology's Other Comments.

- The SAP in the *January 6 Response Letter* also included slug tests (Section 2.11) and NAPL transmissivity tests (Section 2.12). Please explain why these procedures are included in the SAP.
- The *January 29 Response Letter* included an updated Table 1 and Table 5, and indicated that the sampling data collected in and post-2005 will be submitted to Ecology's electronic Environmental Information Management (EIM) database. Ecology appreciates the submission of updated data tables, and expects your data submission to EIM.

• The *January 29 Response Letter* indicated the Site may qualify for a Terrestrial Ecological Evaluation (TEE) exclusion based on WAC 173-340-7491(1)(b). However, this exclusion requires an institutional control (IC) with an Environmental Covenant (EC). Before an IC is established, this exclusion is not applicable for the Site.

Instead, this Site may qualify for a TEE exclusion in accordance with WAC 173-340-7491(1)(c). There appears to be less than 1.5 acres of contiguous undeveloped land on or within 500 feet of any area of the Site. If the Site qualify for this exclusion, a complete TEE form with a Site map with the 500-foot radius need to be submitted to Ecology.

Again, Ecology appreciates your timely response to our letters. Thank you for choosing to clean up the Site under the Voluntary Cleanup Program (VCP). After you have addressed our concerns, you may request another review of your cleanup. Please do not hesitate to request additional services as your cleanup progresses. We look forward to working with you.

For more information about the VCP and the cleanup process, please visit our web site: <u>www.</u> <u>ecy.wa.gov/programs/tcp/vcp/vcpmain.htm</u>. If you have any questions about this opinion, please contact me by phone at 425-649-7109 or e-mail at jing.song@ecy.wa.gov.

Sincerely,

Jing Song Site Manager Toxics Cleanup Program, NWRO

cc: Justin Vetter, AECOM (<u>Justin.Vetter@aecom.com</u>) Renee Knecht, AECOM (<u>Renee.Knecht@aecom.com</u>) Lakeshore Investment Corp 820126 (Property Owner, (<u>exec@lakeshoreinvestment.com</u>)

Ecology Comment Letter: Figure 1



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PROPOSED MONITORING WELL •

NOTES:

WASHINGTON STATE PLANE COORDINATE SYSTEM NAD 83 / CORS 96, NORTH ZONE 4601 IN U.S. SURVEY FEET.

SOURCES: ORIGINAL FIGURE CREATED BY GHD. DELTA CONSULTANTS, FIGURE 2, SITE MAP, DATED 07/28/2010: STATEWIDE LAND SURVEYING INC. DATED 12/16/11, and 9/15/14.

AECOM

Figure 3 **PROPOSED VAPOR SAMPLING LOCATION**

Ecology Comment Letter: Figure 2



Figure 2 Typical Soil Vapor Probe

Ecology Comment Letter: Figure 3

