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Brian Harris
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Larry Vandermay
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Cary Bechtolt
Ed Niemi Oil Company
PO Box 989
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Re: Updated Focused Feasibility Study Report
Area of Concern 1 (AOC1)
Astoria Area-Wide Petroleum Site
Astoria, Oregon
ECSI #2277; Order ESCR-NWR-01-11

Dear Misters Harris, Vandermay, and Bechtolt:

The Oregon Department of Environmental Quality Cleanup Section (DEQ - Cleanup) reviewed the March 1, 2017 *Updated Focused Feasibility Study Report* and has the following review comments:

General Comments

1. Report Title

Overall, the report does not meet DEQ guidelines regarding a feasibility study. The submittal provided does not include the development and evaluation of a range of remedial action alternatives. For each remedial action alternative, an FS must evaluate:

> (a) The protectiveness of the alternative based upon the standards set forth in OAR 340-122-0040;
> (b) The feasibility of the alternative based upon a balancing of the remedy selection factors which include effectiveness; long-term reliability; implementability, implementation risk, and cost reasonableness; and
> (c) The extent to which the remedial action alternative provides for treatment or excavation of hot spots of contamination. OAR 340-122-0085(4).

Under DEQ oversight, a remedial investigation (RI) was completed. The RI identified concentrations of soil vapor that exceed the DEQ human health screening level values (RBCs) for vapor intrusion into buildings. Given there are currently no buildings on the subject property, and no plans for future building construction, there is no unacceptable

risk onsite while these conditions remain in-place. Institutional and engineering controls are therefore acceptable as the final remedy for protecting potential future receptors.

Sites that permanently incorporate engineering or institutional controls to be protective remain on the *DEQ Inventory of Sites Requiring Further Action (Inventory)* as required by ORS 465.225(1)(b) and 465.230(2). To memorialize the necessary controls DEQ will prepare an *Easement and Equitable Servitude (EES)* for the site that must be signed by the property owner or owners and recorded on the property deed. The EES will document the requirements for the site to remain protective and support a *Conditional No Further Action (cNFA)* determination, including institutional and engineering controls, and will incorporate a *Contaminated Media Management Plan* (*CMMP*) as an attachment.

Action Items:

a. Revise the title of the document to correspond more accurately with the scope and content such as: Remedial Investigation Summary; Protectiveness of Proposed Engineering and Institutional Controls; and request for an EES.
b. Be prepared to sign an EES agreement with DEQ and coordinate with Clatsop County to have the EES recorded on the property deed.

2. Protectiveness

How the proposed institutional and engineering controls meet the requirement for protectiveness should be presented.

Action Items:

Add a new separate section to the report on protectiveness of the proposed remedy. Provide a summary table of the Environmental Media, the Contaminants of Concern, and the Pathways that are currently complete or that may be complete in the future. Describe in the text how contaminants in impacted soil, groundwater, and soil vapor that exceed the DEQ Risk Based Concentrations for Petroleum Hydrocarbons (RBCs) will be controlled by the engineering and institutional controls proposed for the site.

3. Potential Explosion in Confined Spaces with Dangerous Atmospheres

The report greatly downplays the potential risk for explosion due to gasoline vapors in the soil and in adjacent utility lines, monitoring wells, catch basins, and manholes. It states that because 100% LEL was not observed, the site is not of concern for an explosive atmosphere. According to OSHA Regulations 29 CFR Section 1915.12(b)(3) Flammable atmospheres:

"Atmospheres with a concentration of flammable vapors at or above 10 percent of the lower explosive limit (LEL) are considered hazardous when located in confined spaces. However, atmospheres with flammable vapors below 10 percent of the LEL are not necessarily safe. Such atmospheres are too lean to burn. Nevertheless, when a space contains or produces measurable flammable vapors below the 10 percent LEL, it might indicate that flammable vapors are being released or introduced into the space and could present a hazard in time. Therefore, the cause of the vapors should be investigated and, if possible, eliminated prior to entry."

Action Items:

Reevaluate the data and note readings that could indicate flammable vapors that should be monitored. Discuss the evaluation and findings, and provide recommendations for ongoing monitoring in the report text.

4. Confined Spaces

The report refers to manholes and catch basins as "unconfined spaces" when they should be considered confined spaces. According to OSHA's Permit-required Confined Spaces Standard - Appendix A: 29 CFR 1910.146, Permit-required Confined Spaces:

"Confined space" means a space that: (1) Is large enough and so configured that an employee can bodily enter and perform assigned work; and (2) Has limited or restricted means for entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry.); and (3) Is not designed for continuous employee occupancy."

Manholes are clearly confined spaces. Catch basins may or may not be confined spaces, depending on the size. Site test pits are confined spaces. Recovery wells and monitoring wells may or may not be confined spaces, depending on the size.

Action Items:

Revise the references to confined and unconfined spaces to correspond to the OSHA definition of confined spaces.

5. Hydrogen Sulfide (H_2S) Vapors

a. Hydrogen sulfide vapors detected in monitoring wells warrant more notice and discussion than provided in the report. According to Table 7, H_2S concentrations measured in monitoring wells MW-28 (160,000 ppm) and MW-29 (200,000 ppm) exceed the *OSHA immediately dangerous to life and health (IDLH)* concentration of 100 ppm by 1,600 and 2,000 times, respectively.
b. The *Flammability Range* for H_2S is between the *Lower Explosive Limit* of 43,000 ppm and the *Upper Explosive Limit* of 460,000 ppm. Concentrations measured in monitoring wells described above are within the *Flammability Range*.
c. H_2S findings are not depicted in the *Utility Line Cross-Sections*, Figures 9 and 10. Construction workers involved in potential future construction projects, especially those with basements, could be adversely impacted by these vapors.

Action Items:

a. Include MW-29 in the B-B' cross-section in addition to A-A'.
b. Show the H_2S findings in Figures 9 and 10 and discuss the H_2S findings in the text.
c. Describe how the potential risk from H_2S vapors can be effectively mitigated through institutional and engineering controls.
d. Include monitoring of hydrogen sulfide soil vapors in the *Contaminated Media Management Plan*.
e. Include a site-specific *Health and Safety Plan* consistent with OSHA 1910.120 regulations including:
    1. The location and magnitude of the contamination;
    2. Plan view and cross-section maps of the contamination;
    3. Methods for monitoring air quality in confined spaces;
    4. Action levels; and
    5. Appropriate responses.

6. Potential Preferential Pathways for Soil Vapors

The absence of soil vapors settling in stormwater catch basins is not indicative of the absence of preferential transport pathways for soil vapors. Stormwater pipelines and the trench backfill around the pipelines may allow soil vapors to flow along preferential flow pathways, while not necessarily accumulating in catch basins. DEQ will require semi-annual monitoring of soil vapor concentrations for a period of five years following the date of the cNFA. Monitoring will be one of the conditions of the cNFA.

Action Items:

a. Prepare a vapor monitoring work plan for semi-annual testing of vapors that encompasses the scope of work in the Kleinfelder, 2016 report titled *Utility Line and Monitoring Well Vapor Monitoring Evaluation*. Utility lines, catch basins, manholes, and monitoring wells should be monitored for LEL gasoline, H_2S, CO, VOCs, and oxygen.
b. Submit the work plan for DEQ review and comment. Once approved the work plan will be included as an attachment to the Niemi Oil Cardlock EES.
c. Plan to submit the soil vapor monitoring results to DEQ for review within 45 days of data collection.

7. Building Locations on Figures

Most of the report figures do not show the locations of buildings. This is important because vapor intrusion into buildings is a potentially complete pathway onsite and also on adjacent properties where soil vapors have migrated.

Action Items:

a. Revise Figures 3, 6, 7, and 8 to include the locations of buildings and the extent and magnitude of the soil contamination, soil vapor plumes, and groundwater plumes.
b. Discuss the potential for vapor intrusion to enter the buildings.
c. Note the buildings that were constructed with an engineered vapor barrier and a soil vapor collection system.

8. Impacts to offsite properties: former Qwest (now CenturyLink); Burlington Northern Railroad right-of way; City of Astoria roads (Industry Street) and utilities; Port of Astoria Property

Report figures 3, 4, 5, 6, 7 and 8 show that site-related petroleum hydrocarbons have impacted the following:

a. Soil – Beneath Industry Street and the Burlington Northern Railroad.
b. Soil Vapor – Beneath Century Link, Industry Street, Burlington Northern Railroad, and Port of Astoria property.
c. Groundwater - Beneath Century Link, Industry Street, Burlington Northern Railroad, and Port of Astoria property.

Action Items:

Additional sampling necessary to determine the extent and magnitude of contamination is described in comments #9 and #10 below. DEQ will communicate offsite impacts to the other AAW Responsible Parties.

9. Extent and Magnitude of Soil Vapor Impacts

Soil vapor measurements collected at SV-4 exceed DEQ RBCs for urban residential yet the estimated extent of soil vapor concentrations above the RBCs is shown on the northern edge of the sample location in Figures 6 , 7, and 8. The same issue occurs at SV-2 but this is less significant because of the change in topography at the property line to the south.

Soil vapors likely extend onto the Port of Astoria property to the north. More information is needed to clarify the extent and magnitude of soil vapor impacts to Port property in order to institute the necessary controls on land use and exposure of occupational and excavation workers to contaminants.

Action Items:

Complete additional soil vapor sampling on Port of Astoria property to determine the extent and magnitude of soil vapor impacts. Install at lease two borings parallel to the property line and north of SV-4. Borings should extend to 5 feet below ground surface, but may be shallower depending on shallow groundwater occurrence, but no shallower than 2 feet without DEQ approval. Perform the sampling and analysis in accordance with the referenced work plan, (AMEC/Kleinfelder, 2012b) *Supplemental Soil Vapor Assessment Work Plan*, and subsequent communication with DEQ.

10. Potential Presence of LNAPL in Groundwater

LNAPL reportedly was observed in groundwater during the underground storage tank work performed in the 1990s. LNAPL was not observed in groundwater during the Remedial Investigation conducted from 2002 to 2008. Water quality samples have not been collected since the quarterly monitoring that was performed for the Remedial Investigation.

In addition, concentrations of gasoline-range petroleum hydrocarbons and benzene in soil and groundwater samples collected just west of the 20,000 gallon gasoline UST and overhead fueling rack (MW-28) during the RI were below DEQ RBCs for occupational and construction workers. In contrast, soil vapor samples collected from the same approximate location in 2011 and 2013 were detected at concentrations well above the RBCs. Gasoline-range hydrocarbons were detected at 25 to 51 times the RBC, and benzene was detected at 43 to 131 times the RBC for occupational workers.

The discrepancy in the concentrations of the soil and groundwater results collected prior to 2008 and the soil vapor results collected in 2011 and 2013 suggests that a gasoline range release may have occurred in the vicinity of the loading rack after the RI sampling was complete. No other explanation has been provided regarding this discrepancy.

Action Items:

a. Test monitoring wells MW-22, MW-23, MW-26, MW-28, MW-29, and MW-30 for the presence and thickness of LNAPL.

b. Measure the depth to groundwater in the same wells and calculate the elevation of the water table, correcting for LNAPL presence as appropriate

c. Prepare a groundwater table contour map as a new report figure.

d. Show the direction of the horizontal flow gradient and include a calculation of the gradient in the report.

11. Professional Stamp

DEQ reports that include interpretation of geology require a stamp by a registered geologist in Oregon and engineering designs a professional engineer stamp. The report is signed but not stamped.

Action Items:

Please stamp the report.

12. Closure Status

The Niemi Oil Cardlock facility reportedly has been inactive and the fuel storage tanks emptied of product since 2015. DEQ records show that some of the fuel storage tanks, fuel lines, and distribution facilities have not been decommissioned. According to the 2008 *Remedial Investigation Report* the Cardlock included:

- Two 10,000-gallon diesel USTs;
- One 20,000-gallon gasoline UST;
- One gasoline and diesel dispenser island;
- One overhead loading rack;
- Above ground and underground fuel lines;
- Two 550-gallon gasoline USTs (removed in 1999);
- One to three 1,000 and 6,000 gallon petroleum ASTs; and
- One diesel dispenser-island (removed by PNG in 1997).

Action Items:

1. Document the current status of the tanks including:
   a) Date when tanks last had fuel in them, and/or
   b) Date when pumpable fluids were removed, and/or
   c) Date when tank sludge was removed.
2. Describe the closure plans and/or schedule for decommissioning or obtaining a temporary closure permit for the remaining equipment at the Niemi Cardlock site.
3. Complete decommissioning or permitted closure under DEQ Cleanup Section or UST Compliance Section oversight, depending on whether you have plans for future use.
4. If the USTs are to be decommissioned as part of the site closure this would be an ideal time to remove the contaminated soil vapor in the vicinity of the overhead

loading rack. Removal of impacted soil should decrease the necessary monitoring time for soil vapor impacts.

5. If there are plans to sell or lease the property for future use or development, *DEQ's Prospective Purchaser Program* might be suitable for the site. The requirement for *substantial public benefit* could be satisfied through a well-defined scope of work including soil removal, confirmation testing, and reporting needed to ready the site for future use or development.

Section Comments

Section 3.2 Nature and Extent of Contamination

Many of the bullet items in Section 4.1, *Key Site and Contaminant Characteristics*, pertain to the extent and magnitude of petroleum hydrocarbon impacts found in AOC1 and adjacent properties.

Action Items:

Summarize the extent and magnitude of petroleum hydrocarbon impacts into a single section before beginning the discussion of locality of facility and risk assessment.

Section 3.2.5 Potential Preferential Pathways within AOC1

In the second paragraph you state that subsurface utility lines are not influencing the movement of residual petroleum impacts in soil vapor and groundwater beneath AOC1 by referring to Table 7 and Figures 7, 8, 9 and 10 but there is no discussion of the findings that lead to your conclusions.

Action Items:

Expand the discussion to refer to the findings and resulting conclusions for soil vapor and groundwater. Explain whether the utility lines and the backfill surrounding the lines could allow for preferential soil vapor and groundwater flow pathways beneath AOC1.

Section 3.2.6 Lateral and Vertical Extent of Petroleum Impact in AOC1

The lateral extent of soil vapor constituent concentrations were found in samples collected from SV-4 located along the Northern Railroad right-of-way. Property north of the railroad lines belongs to the Port of Astoria. Borings on Port property but adjacent to the Niemi Cardlock site include soil borings SB-701(P); SB-705(P); SB-706(P); and SB-013(A). However, contaminant concentrations in these borings are not shown in Figure 2.

Action Items:

a. Show the data collected and analyzed on the adjacent Port of Astoria property.
b. Indicate whether the flow arrows are the historic or current direction of stormwater flow.
c. Provide an additional figure of historic versus current stormwater flow direction if needed to provide clarity.

Section 3.2.7 Locality of Facility

1. The locality of facility shown in Figure 4 is defined based on naphthalene, 1,2,4-trimethylbenzene, and gasoline-range petroleum hydrocarbons in groundwater that exceed RBCs for direct contact by the excavation worker

in addition to benzene and ethylbenzene in groundwater as described in the text.

2. Figure 4 suggests that VOC-impacted groundwater extends beneath the Charter Communication Office Building at 419 Gateway Avenue.

Action Items:

a. Revise the text to more accurately define the lateral LOF.
b. Explain whether impacted groundwater could be a potential source of vapor intrusion into the Charter Communication Building. Was it one of the buildings constructed with an engineered liner and vapor collection system? If not, has a vapor intrusion evaluation been performed for this building?

Section 3.3 Beneficial Land and Water Use Determinations

1. The Port of Astoria's Master Plan only includes Port property. It does not pertain to the portion of AOC1 between West Marine Drive and the railroad tracks. This area is managed by the City of Astoria and Clatsop County.
2. A 2010 conversation with the City of Astoria is used to describe future land use plans.

Action Items:

a. Describe the ownership of all areas of AOC1 including the railroad, the roads (West Marine Drive and Industry Street), the Port of Astoria, Niemi Oil, and Harris/ VanWest.
b. Update the 2010 beneficial water use survey to include water use within a one half mile radius of the site. Provide an updated survey of water wells and of surface water rights within the radius.
c. Confirm with the City of Astoria that development plans have not changed since 2010.

Section 3.4.2 Conceptual Site Model

The 2008 human health conceptual site model has been updated but a figure is not included in the report.

Action Items:

Provide a figure of the updated human health conceptual site model in the form of a flow chart.

Section 3.4.6 Potential Risk Due to Explosion

In the last sentence of the first paragraph you refer to "accumulating vapors in *unconfined spaces*".

Action Items:

Explain whether you meant to refer to "accumulating vapors in *confined spaces*".

Section 5.2 Institutional Controls – Niemi Oil Property Restrictions
An EES typically prohibits shallow groundwater use. This restriction may not be necessary because the use of shallow groundwater is unlikely at the site. Municipal water is supplied by the City of Astoria.

Section 5.3 Engineering Controls

a. Niemi Oil - The engineered vapor barrier beneath any proposed future commercial building constructed within the inferred lateral extent of COPCs in soil vapor above generic RBCs should include a DEQ-approved engineered vapor mitigation system (e.g. vapor barrier in combination with a sub-slab venting system). Alternatively, additional sampling and analysis could be completed to determine if a vapor barrier is needed.

b. Century Link Service Center – The eastern-most 20 feet of the CenturyLink property (Clatsop County Tax Lot Number 80907CC02201) will need an engineered vapor mitigation system beneath any proposed future construction of a commercial or industrial building. Presumably the mitigation system would include a DEQ-approved vapor barrier in combination with a passive sub-slab vapor collection system with potential to be upgraded (e.g. active venting system) if needed. Alternatively, additional sampling and analysis could be completed to determine if a vapor barrier is needed.

c. Port of Astoria – Explain whether the Port of Astoria property will need engineering controls for potential future building construction.

Action Items:
Clarify which properties will need engineering controls for potential future building construction based on land used and zoning.

Section 5.4 Contaminated Media Management Plans
Niemi Oil - The CMMP will be required as an attachment to the EES for Niemi Oil Cardlock.

Harris VanWest - The Harris VanWest site will also need a CMMP but will be an attachment to the cNFA since soil vapors do not necessitate an EES at the site.

Century Link Service Center – A CMMP will be sent to CenturyLink for their use on the portion of their property impacted by soil vapor.

Port of Astoria Property - The contamination that extends onto the Port of Astoria property will be recorded on a *Port Layout Plan* which will include many of the features of an EES. It will show the horizontal and vertical extent of contamination in soil, groundwater, and soil vapor on the property. Contractors entering the site will be required to review and sign off on the plan before excavation or construction work. It will include the CMMP as an attachment.

Action Items:
Revise the section to include the impacted offsite areas.

Tables

Tables 1, 2, and 3
Tables 1, 2, and 3 include all of the RI soils data. These tables would be more useful as an appendix and the tables in the text could be limited to the soil detections.
Action Items:
Revise Tables 1, 2, and 3 to include just the soil detections. Highlight concentrations that exceed screening values.

Tables 4 and 5
Tables 4 and 5 include all of the RI groundwater data. These tables would be more useful as an appendix with the tables in the text limited to the groundwater detections.
Action Items:
Revise Tables 4 and 5 to include just the groundwater detections. Highlight concentrations that exceed screening values.

Table 7
DEQ is concerned about the vapor detections in the monitoring wells that exceed 10 percent LEL, an OSHA action level for evacuation based on explosive hazards. MW-28 and MW-29 both had more than 30 percent lower explosive limit readings. If similar concentrations were detected in a building basement, it would be a cause for evacuation of the occupants.
Action Items
Potential explosive levels should be noted on the EES. The CMMP should also note the need for monitoring during excavation and construction activities.

NEXT STEPS

1. Please revise the report in accordance with DEQ's comments.
2. Prepare a work plan and sampling plan for soil vapor sampling on Port of Astoria property impacted by vapors that have migrated to the north.
3. Prepare a CMMP for Niemi Cardlock and other areas within AOC1.
4. Work with DEQ to complete an EES for the Niemi Oil Cardlock site.

Feel free to call me at (503) 229-5213 if you have any questions concerning DEQ's comments.

Sincerely,

Anna Coates, R.G.
Project Manager
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