



STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

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January 11, 2018

Ms. Dana Cannon
West of 4th Project Coordinator
Aspect Consulting
401 2nd Ave S, Suite 201
Seattle, WA 98104

Re: **West of 4th Site - Agreed Order #DE 10402**
Site Unit 1, CVOC Pilot Study Work Plan

Dear Ms. Cannon:

On December 21, 2017, the Washington State Department of Ecology (Ecology) received an Emailed copy of the revised Site Unit 1 *CVOC Pilot Study Work Plan*. The revised Work Plan was submitted by the West of 4th PLPs in accordance with Agreed Order (AO) 10402, amended on November 21, 2017.

Thank you for submitting the revised Work Plan by its due date. The document is hereby approved. The PLPs should now proceed to implement the revised Work Plan in accordance with the project schedule contained in Figure 14.

During preparation of the draft Field Investigation Work Plan, please consider the following:

1. Ecology agrees that EAnB could potentially be a better technology choice for the pilot study than ISCR or EAnB plus ISCR. However, we do not believe that EAnB plus ISCR should only be chosen if “concentrations of total CVOCs...” measured during baseline sampling are greater than levels measured at MW 24-30 (as stated in Section 4.2, page 17). As the Work Plan explains, there are advantages and disadvantages to applying EAnB (alone) versus EAnB/ISCR, and a number of factors should be weighed before proposing an optimum – for study purposes – technology in the FIWP.
2. Ecology agrees that the PLPs should juxtapose post-injection CVOC trends measured at the study’s monitoring wells with trends associated with other wells located nearby, outside the study area (as proposed in Section 4.3’s “2”, page 18). We suggest that pre-injection CVOC trends at the MW-24 wells also be included in the evaluation.
3. Operational monitoring should, as the Work Plan proposes (on page 25), be performed per SOPs. But other than the water-level monitoring activities planned for this time period, it is not clear what procedures from the two references cited in Section 6.2.1 (PGG 2017, and Aspect 2008) are applicable to this study’s *operational* monitoring.



The FIWP's group of attached SOPs may include West of 4th SOPs that have already been prepared and reviewed by Ecology, but should be comprehensive and cover the various injection, QA/QC, and monitoring actions anticipated for the field.

4. The contingency plan should be revisited once the specific elements of the pilot study's design and monitoring plans are better known. At this time the PLPs should consider:
 - Whether sampling results from MW-24-30 should be the only data used for triggering "contingency actions." This is a "pilot study" and we should be prepared for the *unexpected*. So if unexpected monitoring results are observed/measured at other monitoring wells, it is reasonable to assume that we may need to respond, as needed, even if results at MW-24-30 do not trigger the Work Plan's proposed actions (described on page 27).

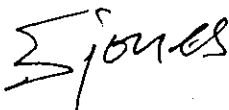
The Work Plan has identified a number of monitoring results that we do not anticipate, such as: a) excessive levels of methane in groundwater, b) increasing concentrations of certain groundwater metals, that persist downgradient, and c) distribution of concentrated reagent and/or tracer to areas further down (or cross-) gradient than desired. Most of these unexpected outcomes are only potentially worrisome should they affect the quality of groundwater discharging to the Waterway. But the methane concern is primarily related to soil gas contamination, and the potential vapor intrusion threat to structures east of the river. The FIWP's contingency plan should propose specific "early warning" monitoring and response actions that comprehensively address the various concerns and the scenarios they are based on.

- How groundwater monitoring results for arsenic should be evaluated (in terms of the need for implementing some form of contingency action). An arsenic concentration of 5 µg/l is a "Puget Sound background" value than can be used to adjust surface water and groundwater cleanup levels. But the risk-based surface water arsenic concentration is more than an order of magnitude lower (≈ 0.1 µg/l). Using a 2X increase in downgradient as concentrations – by itself – to trigger contingency considerations is more reasonable.
- How groundwater monitoring results for methane should be evaluated (in terms of the need for implementing some form of contingency action). As noted above, very large increases in groundwater methane levels are primarily a concern for enclosed air spaces within nearby structures. For this reason the Work Plan proposes that sampling results from the five PSW wells be evaluated in addition to those obtained from MW-24. Although we agree that all Shallow and Water Table zone monitoring wells in the project area be sampled for methane, Ecology suggests – and especially if EAnB is chosen as the study's remediation technology – that the FIWP's contingency plan also:
 - a) supplement the 10X [methane level] contingency action trigger with a *not to exceed* concentration such as 7 mg/l. Should either of these triggers be exceeded, the prompt installation of soil gas monitoring ports would be a reasonable first-step response; and

- b) include a decision-point before "Week 3" groundwater monitoring that, based on methane data from DR wells sampled during Weeks 1 and 2, determines if methane analyses at the five PSW wells, MW-24, and/or MW-24-30 should be performed earlier than Week 4.
5. The 1,1-dichloroethene (DCE) surface water PCUL in Table 1 is 3.2 µg/l. This value should seemingly be 4000 µg/l (now).
6. Coordinating the pilot study's fieldwork with businesses located north and south of Fidalgo St. is key, in our opinion, to maintaining good relations with members of the local public affected by the injection and sampling activities being planned. The FIWP should contain specific measures to reduce and/or control anticipated study-related transportation impacts and ensure minimal inconvenience to drivers approaching and leaving businesses served by this stretch of S. Fidalgo St. As noted in Ecology's SEPA threshold determination, we expect these measures to include: notification and coordination between the study's field team members and the affected businesses; scheduling of the most potentially disruptive fieldwork during days and hours when traffic in the area is expected to be lighter; and, as possible and needed, providing work-around lanes for vehicles accessing the area during well installation, injection, and monitoring events.

If you have any questions, or would like to schedule a meeting or conference call to discuss today's letter, please contact me at (425) 649-4449 or ejon461@ecy.wa.gov.

Sincerely,



Ed Jones
Environmental Engineer
Hazardous Waste and Toxics Reduction Program

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