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December 18, 2012

Ronald S. Taylor
President
Capital Industries Inc
PO Box 80983
Seattle, WA 98108-0286

Re: **Capital Industries Site# 11598755**
Remedial Investigation Agreed Order #DE 5348
Revised Remedial Investigation Report

Dear Mr. Taylor:

On October 11, 2012, the Washington State Department of Ecology (Ecology) received Capital Industries' (Capital's) revised *Remedial Investigation Report*. Thank you for submitting the document and your efforts to address Ecology's September 2011 comments on the draft Report. The revised Report, however, is a required deliverable of Capital's Agreed Order and was received by Ecology after the approved, enforceable due date. This constitutes a violation of the Order.

Ecology focused our review of the revised Report on three main areas:

(1) Determining whether site contamination is presently understood well enough to assess the potential effects on current and future receptors, and initiate an evaluation of cleanup alternatives (a feasibility study);
(2) Determining whether assertions, hypotheses, and conclusions presented in the document are approvable. That is, determining whether Ecology agreed with the Report's more important interpretations of RI data, and assertions and conclusions regarding the nature and extent of contamination; and;
(3) Determining whether Ecology's September 2011 comments on Capital's draft RI Report were satisfactorily addressed.

Ecology hereby conditionally approves Capital's revised RI Report. No revisions to the October 2012 Report are therefore required. In Enclosure A, Ecology has noted those parts of the revised Report which are not approved (in some cases modifying or adding language to the document). We have also included a number of comments and points of clarification. For ease in distinguishing approval "conditions" from remarks that are only comments, the conditions have been bolded.

The final approved RI Report, then, is a combination of Capital's October 2012 revised RI Report and today's letter. If Capital disagrees with the approval conditions (our deletions or modifications of Report language, or the language added by Ecology to create an approvable document) provided in Enclosure A,

please notify me within fourteen (14) days of receipt of today's letter.[1] We can then schedule a meeting to discuss the particular conditions at issue.

Capital's revised RI Report was not only reviewed by Ecology. It was also reviewed by the Georgetown Community Council's environmental consultant, Environment International (EI). EI's comments are included in Enclosure B. EI noted that a number of their 2011 comments were not addressed in the revised Report. Presumably, this means that there was no effective communication between Capital and EI (or the Community Council) over the twelve months following issuance of Ecology's comments on the draft Report (which contained EI's comments on that document). This is unfortunate. Capital need not have agreed with EI's 2011 comments, of course, but it would have been a simple matter to have addressed a number of them during document revision. For those comments Capital disagreed with, the company could have easily contacted the Council or EI, explained its position, and offered to either meet with EI and/or provide additional supporting information. There was ample time for such activity in advance of preparing the revised Report. During the FS it is in Capital's best interests to respect comments received from the public, and meaningfully engage those who have taken the time to review the company's documents and proposals.

Comments on Capital's Report were also submitted to Ecology by Art Brass Plating (Art Brass), PSC Environmental Services (PSC), and CalPortland. Art Brass, PSC, and CalPortland comments are contained in Enclosures C, D, and E, respectively.

If you have any questions about the comments, and/or would like to schedule a meeting with Ecology to discuss the comments prior to revising the Report, please contact me at (425) 649-4449 or ejon461@ecy.wa.gov.

Sincerely,

EJones

Ed Jones
Environmental Engineer
Hazardous Waste and Toxics Reduction Program

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Enclosures
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[1] Capital then has an additional seven days to provide Ecology specific reasons for its objections to the approval conditions. These are the applicable timeframes set out in Section VIII.J of the Agreed Order.

ENCLOSURE A

Capital Industries
October 2012 Revised RI Report
Ecology comments and approval conditions

GENERAL COMMENTS

1. In several comments below Ecology has clarified how pathway "completeness" should be judged. An exposure pathway is potentially *complete* when there is a receptor and a route/pathway that links the receptor to site contamination (exposure). However, the RI Report's use of "completeness" seems to also incorporate some element of risk assessment. That is, some pathways appear to be deemed incomplete because the risk to the receptor is considered acceptably low. Complete exposure pathways, however, can be associated with either acceptable or unacceptable health risk.

   Therefore, in a number of Specific Comments we note that a current or future pathway should be considered *complete* that Capital has characterized as incomplete. In many cases this does not reflect any disagreement on the perceived degree of health risk associated with that pathway and receptor.

   Ecology uses the following terms when describing exposure pathways:

   - currently complete pathway: there is currently a receptor and the route/pathway being evaluated currently exists, potentially exposing that receptor to site contamination.
   - currently incomplete pathway: there is currently no receptor, or the route/pathway being evaluated does not currently exist.
   - potentially complete current pathway: there may currently be a receptor and the route/pathway being evaluated may currently exist. Receptor may therefore be potentially exposed to site contamination. However, insufficient information is presently available to determine if the pathway is indeed currently complete.
   - potentially complete pathway in the future: there is the possibility of a future receptor, and the route/pathway being evaluated may exist in the future. So the receptor may be exposed to site contamination in the future.
   - incomplete future pathway: there is no possibility of a future receptor. Or, the route/pathway being evaluated will not exist in the future.

   To minimize misunderstandings, Ecology asks that Capital also use these terms, with these definitions, during the upcoming FS.

2. For several receptors and pathways there are no standard cleanup levels identified in WAC 173-340. For instance,

a) "trenching" (below ground) receptors and the pathways through which these receptors could be exposed to site contamination;
b) outdoor receptors inhaling air contaminated with site VOCs, and
c) outdoor receptors who may inhale contaminated dust.

For trenching receptors the current receptor risk can be considered to be mitigated[2] except in those cases where the belowground work is conducted off the property by someone other than a utility company representative. For these trenchers we believe it is reasonable for the RI Report to consider the pathway complete, but *assume* the potential risk is currently acceptable.

Similarly, those outdoor receptors who could currently inhale VOCs emitted from the ground surface are primarily those located off the property in areas where the ground surface is not covered. While Ecology believes this pathway should be considered complete, we also think it is reasonable for the RI Report to *assume* the potential risk is currently acceptable.

In the FS, however, Capital and the other west-of-4th parties will need to consider these receptors (trenchers and other outdoor receptors), as well as those who may inhale contaminated dust (should the present cover on soils be removed in the future), when establishing cleanup levels. How this assessment is conducted may depend on the cleanup alternatives being evaluated. For example, if a particular cleanup action will reduce soil COC concentrations to their Method B direct-contact cleanup levels, this action will also clearly protect trenchers via the direct contact pathway (to soils). No separate evaluation would be necessary.

But for actions that leave residual levels of contamination in place, either permanently or for a prolonged period before full remediation, questions regarding outdoor receptor risk may remain. While in some cases the receptors could be protected by implementing controls, we should not choose such an option unless we firmly believe these receptors would otherwise be potentially exposed to unacceptable risks. For most of Capital's COCs and areas/media of contamination, the health threat posed to current and future outdoor receptors via these pathways is likely to be low.

During the FS the west-of-4th PLPs should plan to develop SLs for the outdoor receptors discussed above. Ecology does not anticipate that this will result in a significant workload and is willing to help the PLPs if this will facilitate completion of the task. SL equations for the receptors and pathways described above can be obtained from the following sources:

- The 1996 EPA *Soil Screening Guidance User's Guide* (9355.4-23). Equations 3, 4, and 5 are appropriate for calculating dust inhalation SLs. Equations 6, 7, and 8 can be used to calculate outdoor VOC-inhalation SLs. The companion 1996 *Soil*

[2] If Capital has implemented a protocol to inform subsurface workers of the nature of the contamination on the property and the types of protective equipment that must be utilized to perform the work safely.

Screening Guidance Technical Background Document (EPA/540/R-95/128) provides supporting information and generic SL tables.

- The 2002 EPA *Supplemental Guidance for Developing Soil Screening Levels* (9355.4-23). Section 4 discusses non-residential receptors and provides equations for calculating dust (4-3 through 4-5) and outdoor air VOC (4-6 through 4-8) SLs. Section 5 discusses "construction" receptors – who may be exposed similarly to "trenchers" – and provides equations for calculating dust and outdoor air VOC SLs (5-1 through 5-5, and 5-12 through 5-14).

3. A relatively large number of Specific Comments and conditions follow. The number of comments is directly related to the number of times the Report includes an assertion Ecology does not agree with or cannot otherwise approve. Capital's Report repeated several of the same problematic assertions multiple times.

SPECIFIC COMMENTS

INTRODUCTION (1)

1. Page 1-1, section 1.1. Point of clarification: The second sentence of the section summarizes the objectives of Capital's RI. Ecology agrees that characterizing the nature and extent of VOCs was an RI objective, and even the RI's primary objective. But the purpose of the RI was to characterize the nature and extent of all site contaminants of concern (COCs), not just volatile COCs.

SITE BACKGROUND (2)

2. Page 2-1, section 2.0. The second paragraph refers to the 2008 Data Summary Report and states that the CalPortland facility is one of the "known sources of VOCs to groundwater." The Data Summary Report, however, does not appear to identify this facility as a known source of VOCs to groundwater. Nor, in Ecology's opinion, does the revised Report include a demonstration that the facility is a known source of groundwater VOCs. Although Capital appears to be believe that a release of VOCs occurred at the CalPortland property, the company must remember that the RI Report is a deliverable required by Capital's Order with Ecology. Statements in the Report must therefore either be approvable (by Ecology) or qualified in such a manner that it is clear that the company is voicing an opinion Ecology is not being asked to approve. **The second sentence in the second paragraph of section 2.0 is only approved as part of the final RI Report with the deletion of "and the CalPortland Facility."** Please see Comment #55 below.

3. Page 2-9, section 2.3.4. Note: The Report should have contained the reference for the area meteorology discussion.

4. Pages 2-9 and 2-10, section 2.3.5. Point of clarification: This section of the Report discusses the beneficial use of site groundwater. Capital states that site groundwater should not be considered potable; that is, it should not be considered a future source for drinking water. The Report refers to earlier work done at the PSC-Georgetown site and the Cleanup Action Plan (CAP) for that site.

   The west-of-4th FS may propose that site groundwater be considered non-potable for the reasons groundwater was declared non-potable in the PSC-Georgetown east-of-4th CAP. However, Capital should not lose sight of the reasons Ecology made this decision in the PSC CAP. Groundwater *at that site* contained natural background concentrations of organic or inorganic constituents that made use of the water as a drinking water source not practicable in the foreseeable future (please see WAC 173-340-720(2)(b)(ii)). There are requirements contained in PSC's CAP for ensuring, over the long-term, that: a) receptors remain protected in the future and, b) the non-potability decision remains valid in the future. If groundwater in Capital's site area is also deemed non-potable, Ecology assumes that similar requirements will be needed as part of a cleanup action plan for that area.

5. Page 2-13, section 2.4.2.1. Point of clarification: Capital states here that the intermediate zone extends from a depth of approximately 40 to 70 feet bgs. Since the Silt Aquitard may not be present beneath the intermediate zone within the Capital Area of Investigation (as the Report correctly notes), 70 feet bgs should not be considered the lower boundary of the intermediate zone – though it may have been the deepest depth investigated.

TECHNICAL ELEMENTS (3)

6. Page 3-1, section 3.1. The Report begins its discussion of potential exposure pathways "in the West of 4th Groundwater Investigation Area" by describing potential "direct pathways in soil…" Capital states that "[d]irect human exposure via ingestion, inhalation, or dermal contact by temporary construction workers performing intrusive subsurface work..." is one such pathway. The "pathway" to aboveground workers is incomplete, according to the Report, because contaminated soils are covered.

   First, while Capital may have meant to refer in this section to contaminated areas in its own RI study area, as well as other contaminated areas west of 4th Avenue, Ecology focused our review on Capital's site area (or *RI study area*). Our comments below, then, refer to this particular area.

   Second, Ecology is unsure how to interpret Capital's use of the term "direct" here. Typically, *direct contact* is understood to mean ingestion and/or exposure via dermal contact. It is not assumed to also include inhalation pathways.

   Third, while it is true that the exposure pathway to aboveground workers can be considered currently incomplete, or "mitigated," when contaminated soils are adequately covered, this covering cannot be assumed to remain in the future.

Section 3.1 should have clearly identified the following soil-related receptors and pathways (besides "soil leaching to groundwater"):

a) temporary construction workers performing intrusive subsurface work (or, *trenchers*). These receptors can potentially be exposed to soil contamination via several pathways, including direct contact (DC). For the purposes of Section 3.1, this pathway is potentially complete,[3] now and in the future;

b) future aboveground workers exposed to soil contamination via DC. This is a potentially complete pathway in the future should cover be removed; and,

c) future residents exposed to soil contamination via DC. This pathway is potentially complete should residents be present and cover removed.

Therefore, the second paragraph of 3.1 is only approved as part of the final RI Report with the following modifications:

"Potential pathways in soil include:

- "Human exposure via ingestion, inhalation,...on the Capital Site. *Direct contact pathways are currently* incomplete for office and...by buildings and paving. *No residents are currently present in areas where soils are contaminated.*
- Soil leaching to groundwater."

7. Page 3-1, section 3.1. Point of clarification: Following the soil discussion, the Report identifies groundwater-related pathways and receptors. These include trenchers breathing COCs or ingesting contaminated groundwater when working below the water table. Identified pathways also include "discharge to surface water."

   The first bullet should have clearly stated that:
   - temporary construction workers performing intrusive subsurface work (trenchers) can potentially be exposed to groundwater contamination via DC (ingestion and/or dermal exposure) if they work below the water table;
   - on Capital's property this pathway is currently mitigated via controls/notification; in the future it must be assumed to be complete; and,
   - for off-property trenchers the DC pathway is potentially complete, now and in the future.

8. Page 3-1, section 3.1. At the bottom of page 3-1, the Report notes that "inhalation of vapors in indoor air" is a potential air exposure pathway. Ecology agrees, but section 3.1 should have additionally noted that these "vapors" can be due to soil (vadose zone) sources and/or groundwater sources, and that different types of indoor human receptors

[3] A complete, or potentially complete, pathway does not imply that health risks are unacceptable. Risks can be either acceptable or unacceptable.

can be exposed. It should have also clearly identified all significant air-related receptors and pathways. These include:

a) trenchers inhaling air-phase VOCs due to the volatilization of soil contamination, or breathing contaminated soil particles ("dust"). For the purposes of Section 3.1, these pathways are potentially complete, now and in the future;
b) trenchers inhaling air-phase VOCs due to the volatilization of shallow groundwater contamination. This pathway is potentially complete, now and in the future;
c) aboveground workers inhaling air-phase VOCs outdoors due to the volatilization of soil contamination, or breathing contaminated soil particles ("dust"). These pathways are potentially complete in the future;
d) residents inhaling air-phase VOCs outdoors due to the volatilization of soil contamination, or breathing contaminated soil particles ("dust"). Since there are currently no residents living above contaminated soils, these pathways are only potentially complete in the future;
e) aboveground workers inhaling air-phase VOCs outdoors due to the volatilization of shallow groundwater contamination. If all outdoor working areas above groundwater contamination are currently covered, this pathway is only potentially complete in the future; and,
f) aboveground residents inhaling air-phase VOCs due to the volatilization of shallow groundwater contamination. Since there are currently no residents living above contaminated groundwater, this outdoor pathway is only potentially complete in the future.

As noted in General Comment #2, SL concentrations can be developed that are associated with acceptable outdoor risk and hazard levels (as Capital has developed for indoor receptors and the VI pathway). The outdoor SLs per COC will be different depending on the particular receptor of concern, and the type, frequency, and duration of the expected exposure. That is why it is important for the RI to identify specific receptors per individual exposure/migration pathway. A soil SL protective of a worker's inhalation of dust may not be protective of a resident inhaling dust. A SL intended to protect an above ground worker inhaling outdoor air contaminated by soil gas may not necessarily be protective of a trencher.

Therefore, the last paragraph on page 3-1 is only approved as part of the final RI Report with the following modifications:

"Potential exposure pathways for air include:

- *Temporary construction workers performing intrusive subsurface work who inhale air-phase VOCs due to the volatilization of soil contamination, or breathe contaminated soil particles ("dust"). These pathways are potentially complete, now and in the future.*

- *Temporary construction workers performing intrusive subsurface work who inhale air-phase VOCs due to the volatilization of shallow groundwater contamination. This pathway is potentially complete, now and in the future.*
- *Aboveground outdoor workers who inhale air-phase VOCs due to the volatilization of soil contamination, or breathe contaminated soil particles ("dust"). These pathways are potentially complete in the future.*
- *Aboveground outdoor workers who inhale air-phase VOCs due to the volatilization of shallow groundwater contamination. Where outdoor working areas are currently covered, this pathway is only potentially complete in the future.*
- *Currently no residents live above contaminated soils or shallow groundwater. The potential for residents to inhale air-phase VOCs outdoors due to the volatilization of soil contamination, or to breathe contaminated soil particles ("dust"), is only a future concern. Likewise, the potential for outdoor residents to inhale air-phase VOCs due to the volatilization of groundwater contamination is only a future concern.*
- Inhalation of vapors in indoor air. *These vapors may be due to the volatilization of soil or shallow groundwater contamination."*

9. Page 3-2, section 3.1. Ecological receptors can be exposed directly to contaminated media (SW and/or sediments) and they can ingest organisms that have become contaminated. Both are potential pathways. **The last paragraph of Section 3.1 is therefore only approved as part of the final RI Report by adding the following third bullet:**

    - "Direct contact by aquatic organisms."

10. Pages 3-2 and 3-3, section 3.2. This section of the Report describes the various protective concentrations Capital considered when developing soil, groundwater, and indoor air RI screening levels. For soils, Capital identifies Method B and C DC cleanup levels, and Method B groundwater-protection cleanup levels. However, no soil SLs are indentified for the soil-to-soil gas-to indoor air pathway. Nor have SLs been developed for trenchers or for other future outdoor receptors inhaling contaminated "dust" or VOCs. Please see General Comment #2 above and Specific Comment #36 below.

11. Page 3-3, section 3.2. Point of clarification: The Report correctly identifies the AWQC as an ARAR and source for obtaining SW SLs. However, the AWQC are not the only source of SLs and the federal CWA is not the only SW ARAR.

12. Page 3-3, section 3.2. Point of clarification: The second sentence of the "Indoor Air Screening Levels" sub-section states that "inhalation risk is then assessed following the IPIM process." During the RI Capital performed VI assessments to determine which buildings in its study area required interim action (mitigation). The assessment protocol utilized PSC's "IPIM" process. The RI Report may certainly use the information obtained during these assessments, but should have distinguished between the short-term

goal of determining if interim action is needed and the longer-term "cleanup" goal of establishing VI-protective media cleanup levels that can be used in the FS to evaluate remedial alternatives.

13. Page 3-4, section 3.3. This section of the Report identifies COPCs. In the past, 1,1-dichloroethene (DCE) has been detected in study area groundwater at low levels (for example, at points B2, B3, B8, B9, B23, B27, and MW5). However, the surface water SL concentration (based on the National Toxics Rule ARAR) is also low, 3.2 µg/l. 1,1-DCE should therefore have been included in this listing. **The bulleted list on page 3-4 is only approved as part of the final RI Report with the addition of 1,1-dichlorethene.**

14. Pages 3-4 and 3-5, section 3.4. This section of the Report discusses media of concern. The Report states that SW downgradient of the Capital property "has not been sampled and may be a medium of concern from releases within the Capital Area of Investigation from sources other than the Capital Property…" For this reason, apparently, the Report does not include SW as a medium of concern.

    Ecology agrees that releases other than those which occurred on Capital's property may be leading to groundwater contamination that is currently discharging to the Waterway. These releases may also lead to groundwater contamination that will discharge to the Waterway in the future. However, SW should remain one of the "media of concern" identified for Capital's site area; it is the primary "receptor" for groundwater contamination (at least at depths below the water table). **Therefore, the first two sentences of section 3.4 are only approved as part of the final RI Report with the following modifications:**

    > "Soil, groundwater, soil gas, *surface water,* and air are the media of concern for the Capital Site. *During the RI Capital did not sample surface water in areas where groundwater downgradient of the property discharges to the Waterway.* Surface water *in this area* may *also* be a medium of concern *due to contamination* from sources *besides* the Capital Property (See Section… Property)."

REMEDIAL INVESTIGATION RESULTS (5)

15. Page 5-1, section 5.0. There is no mention of 1,1-DCE here, though trans-1,2-DCE is briefly discussed as a COPC whose SLs have not been exceeded. As noted in Comment #13 above, 1,1-DCE should not have been omitted and the FS should clarify where (locations and depths) 1,1-DCE SLs are – and are not – likely to be exceeded.

16. Pages 5-2 through 5-4, section 5.1. Point of clarification: Work related to soils beneath Plant 2 is discussed in this section. The Report states that:
    - After the fire, but before the Plant 2 slab was removed, 12 soil gas samples were analyzed by an on-site laboratory (six samples were also collected in canisters and analyzed via TO-14 off-site). TCE and PCE were detected, as were toluene, ethylbenzene, and xylenes.

- After the fire, and after the removal of the Plant 2 slab, soils "within the building footprint" were excavated to a depth of about 4' bgs. This resulted in removal of about 330 cubic yards (yds3) of soils for disposal.
- PID monitoring occurred during "excavation for footings, vaults, and utility trenches…" This monitoring did not "identify any contaminated soil within the building footprint."
- "Most of the…Plant 2 building footprint was excavated to a depth of 4 feet bgs for foundations and utility trenches…"
- When the PID reading exceeded "5," soils were removed and stockpiled. This resulted in the stockpiling of: two yds3 of soils from the northwest stormwater vault area; 10 yds3 of soils from the southern Plant 2 wall area; and, seven yds3 of soils from the southwest Plant 2 corner area. The total soil volume stockpiled due to PID readings, therefore, appears to be 19 yds3.
- Stockpiled soils were sampled for VOCs, but PCE, TCE, and their breakdown products were not detected. The soils were then "either used as backfill or disposed of off the site…" If the soils were reused on the property, the locations are unknown.
- "Nearly all" of the more than 500 PID readings obtained during soil excavation activities "resulted in a background reading…"
- Two soil samples were collected from one foot bgs and analyzed to "confirm the PID readings." These samples were located in a "northwestern area" and "from the southern portion of…Plant 2." PCE, TCE, and their breakdown products were not detected.

Ecology has summarized this part of the Report because it is important to keep in mind what the information does and does not tell us. First, soil gas beneath the old Plant 2 slab contained chlorinated VOCs. We do not know if the source of these compounds was contaminated soil, contaminated shallow groundwater, or both. Second, 330 yds3 of soils were reportedly excavated from the Plant 2 building footprint *for disposal off Capital Plant 2.* But sub-section 5.1.1 does not say that these soils were in fact disposed of off-property, or where off-property.[4] Third, although 5.1.1 says that "most" of the soils below Plant 2 were excavated to 4' bgs, this amount of soil would be far more than 330 yds3.[5] Fourth, while it is clear that 19 yds3 of soils were removed and stockpiled due to elevated PID hits, it is not clear how these 19 yds3 relate to the 330 yds3 (are they part of the 330 yds3?), or why 311 yds3 of (the 330 yds3 of) Plant 2 soil were excavated. Fifth, it is unclear why sub-section 5.1.1 states that PID monitoring "did not identify contaminated soil within the building footprint," when later it is apparent that PID detections were elevated in certain areas and those soils were subsequently removed and stockpiled. Sixth, the 19 yds3 of stockpiled soils were sampled and analyzed (via non-

[4] In comments received from Blaser Die Casting on Capital's draft RI Report, Blaser referred to the 2004 FSM Report and noted that 328 yds3 of excavated soil went to construction companies for reuse.

[5] In comments received from Blaser Die Casting on Capital's draft RI Report, Blaser referred to the 2004 FSM Report and stated that field notes in that Report suggest that Plant 2 soil excavation occurred primarily along narrow trenches {to run utilities), rather than site wide.

PID methods), and found to be relatively clean. Perhaps they were not collected, then, from the area where solvents were released. And seventh, 5.1.1 does not discuss subsurface conditions beneath Plant 2 after construction was completed. That is, the Report does not identify areas and depths beneath Plant 2 that currently consist of: (1) undisturbed, pre-fire soil/fill (above 4' bgs); (2) fill imported and placed following the fire; and, (3) excavated site soils that were subsequently placed back into the subsurface.

17. Pages 5-5 through 5-7, section 5.1. Point of clarification: Work related to soils beneath Plant 2 is further discussed in sub-sections 5.1.2 and 5.1.3. The Report states that:
    - Soil gas was sampled at a number of locations by ECS after Plant 2 was re-constructed. PCE and trichloroethane were detected, but not TCE.
    - Soil was sampled at a number of locations "in and around" Plant 2 by ECS after the Plant was re-constructed. TCE was not detected "above the water table…" PCE was detected at the southwest corner of the Plant 2 canopy area (two locations). Later the Report states that VOCs were not detected above the groundwater-protection SL (in soils in or around Plant 2 and its canopy area) during the ECS investigation.
    - Soils were sampled at a number of locations (B1-B5 and MW1-MW8) by Farallon. B2 and MW2 were located in the Plant 2 canopy area. No other sampling locations were inside the Plant 2 or canopy area footprints (though B5 was located just northeast of the canopy area and MW4 was only a few feet south of Plant 2).

Again, Ecology has summarized this part of the Report because it is important to keep in mind what the information does and does not tell us. First, soil gas beneath the Plant 2 slab where samples were collected contained chlorinated VOCs (though not TCE, despite the fact that TCE was present in shallow groundwater below many of the soil gas sampling locations). The detected compounds could have been due to contaminated soil, contaminated shallow groundwater, or both. The quality of the soil gas data has not been rigorously assessed.

Second, only a single ECS soil sample (two depths) was located in Plant 2 (ECS33). No cVOCs were detected at this location.

Third, four ECS soil samples (two depths each) were located in the Plant 2 canopy area (ECS34-37). No cVOCs were detected at two of the locations (ECS36 and ECS37). Low levels of PCE were detected at the other two locations (ECS34 and ECS35).

Fourth, Farallon did not sample soils inside the Plant 2 footprint. The canopy area subsurface was sampled, however, and TCE was detected at 8.5' bgs at MW2. TCE was not detected at shallower depths at MW2; nor was it (or other cVOCs) detected at 2.5-3' bgs at B2.

Since re-construction of Plant 2, then, only one soil sample within the building footprint has apparently been analyzed for cVOCs. At this location cVOCs were not detected.

Soil gas beneath Plant 2 has been sampled in a number of locations, but the soil gas data are of questionable quality. More soil sampling was conducted in the Plant 2 canopy area. COCs (PCE primarily) were detected at about half the locations sampled, but TCE was only detected at one location, and at a depth no shallower than 8.5' bgs.

18. Page 5-7, section 5.1.3. 2006 soil sampling results are discussed in this part of the Report and Capital concludes by stating that a "residual source of VOCs in soil to groundwater was not identified at the Capital Property." Ecology understands this statement to mean that the 2006 sampling results did not identify vadose zone soil contamination above groundwater-protection SLs. To arrive at this conclusion one must first define the vadose zone as shallower than 5' bgs, since according to Figure 5, PCE and TCE soil concentrations at 5'-6.5' at both MW7 and MW6 exceeded SLs.

    The second bullet on page 5-7 notes these exceedances, but says that since they were found "just above groundwater," they likely "represent groundwater conditions." Ecology disagrees. Table 4 appears to indicate that groundwater elevations at MW6 and MW7 vary from about 7.3' (MW-7 on Jan. 28, 2011) to 9.0' (MW-6 on Oct. 25, 2010) bgs.

    We should assume, therefore, that samples collected from 5' to 6.5' represent unsaturated conditions. In fact, even if the 7.5'-8.5' interval at MW6 may be saturated during winter months, soil concentrations at this interval should not be assumed to "represent groundwater conditions." **The second sentence of the second bullet and the last sentence of section 5.1.3 are therefore not part of the approved RI Report.**

19. Page 5-8, section 5.1.4. The Report summarizes "pre-RI" investigation results and concludes that these investigations did not identify a "residual source of VOCs in shallow soil to groundwater at the Capital Property." Again, Ecology understands this statement to mean that the pre-2008 sampling results did not identify vadose zone soil contamination above groundwater-protection SLs. As noted in the comment above, we disagree with this conclusion. Nevertheless, Capital is correct that where soils were sampled above the water table, most VOC concentrations were below SLs. There are only a few exceptions (e.g., ECS30, MW6, MW7, and possibly MW2).

    The first bullet is therefore only approved as part of the final RI Report with the following modification:

    > "*Few soil samples collected at depths above the water table during* pre-RI investigations *on* the Capital Property *contained VOC concentrations exceeding groundwater protection screening levels;*"

20. Page 5-8, section 5.1.4. The Report concludes that VOC concentrations greater than SLs were not detected in soils sampled by ECS, when those soils were "native soil at or near the vadose zone." However, section 5.1.2 seems to make clear that TCE was detected at location ECS30 at a shallow depth. The concentration (0.14 mg/kg) exceeded the SL. Ecology does not understand, then, why bullet #2 fails to mention this exceedance.

Perhaps Capital believes soils at ECS30 are non-"native." In any case, **the second bullet is only approved as part of the final RI Report with the following modification:**

> "*With one exception*, VOCs above the current…in soil samples collected from the vadose zone by ECS (2005);"

21. Page 5-8, section 5.1.4. Point of clarification: the third bullet is generally fine as long as Capital understands that Ecology believes these sampling results are reasonably representative of "current conditions…" at those particular sampling locations.

22. Page 5-8, section 5.1.4. The fourth bullet states that most of the Plant 2 building footprint was excavated to 4-5' bgs and then backfilled with imported fill or clean soil. Perhaps this was the case, but as noted in Comment #16 above, the RI Report does not offer strong corroboration for this assertion.

    Capital says that 330 cubic yards of excavated soil were disposed somewhere off-site. But as Ecology noted in commenting on the draft Report, based on the Plant 2 footprint dimensions (shown on Figure 5), it appears that the building covers an area of more than 40,000 ft2. This does not include the Plant 2 canopy area. If soils were excavated to a depth of 4'-5' across such an area, this would result in more than ten times the amount of soil reportedly sent off-site for disposal. The Report does not estimate how much total soil volume was removed from below Plant 2. Nor does it suggest how much of this total soil volume was then put back below the new Plant 2 building or used somewhere else on Capital's property.

    Furthermore, "clean" is a relative term. The Report says that many PID readings (> 500 were taken) resulted in a background reading. If the PID was used properly this is probably a good indication that soil VOC levels at these locations were not extremely high, and were probably below DC-based cleanup levels. Later work by ECS supports this. But soil VOC concentrations protective of groundwater quality for TCE and PCE are very low. PID-screening is a much better tool for identifying where such levels are very likely to be exceeded, than it is for determining where they are clearly not exceeded.

    The fourth bullet is therefore only approved as part of the final RI Report with the following modification:

    > "*Capital believes that* most of the building footprint…or clean soil; and"

23. Page 5-8, section 5.1.4. Point of clarification: The fifth bullet states that Plant 2, the Plant 2 canopy, and Plant 4 were "former" sources of VOCs to groundwater. Ecology agrees, assuming the Report is referring here to historic operations within those Plant areas that led to releases. But if the Report is also referring to the subsurface beneath the three areas, we do not agree that Capital has shown that there are no longer "sources" in these areas (i.e., we do not agree that the subsurface sources are necessarily gone). Many of the pre-2008 sampling results indicate that soil contaminant concentrations are less than groundwater-protective SLs. This is clearly apparent. But many locations were not

sampled, and among those that were, a few had soil COC concentrations exceeding these SLs. Plus, VOC concentrations were detected in a number of soil samples, though below SLs. Are these not, to any extent, suggestive of "sources?" Moreover, "sources" can exist in saturated or partially/occasionally saturated soils at and below the water table. While it *can* be the case that COC concentrations measured in soils at these depths reflect groundwater contamination moving into the sampled area from upgradient, this is not always or necessarily the case.

24. Page 5-8, section 5.2. The Report notes that pre-RI data quality was not assessed and that "in some cases…" this was because of "the age of the investigations and/or lack of availability of laboratory reports." Ecology understands that the documentation for older data is not always complete and we agree that this enhances the uncertainty associated with data quality. This uncertainty, however, should then be forthrightly acknowledged when using critical pre-RI data/information to form conclusions about the nature and extent of site.

    The RI's focus under the Order has been primarily on the current (and to a lesser extent, future) nature and extent of groundwater contamination. Monitoring wells provide the most up-to-date COC concentration information, but there are significant spatial gaps between wells. In these areas where there are no wells, older DP data can be used to help estimate current concentrations. If Capital chooses to use these data, however, the company should then acknowledge the uncertainty associated with the data's ability to represent current conditions.

    More importantly, only limited soil sampling occurred during the 2008-2012 RI. Much of the description of the nature and extent of soil contamination – and especially soil contamination associated with Plant 2 – is based on pre-2008 data that was not collected by the authors of the RI Report. In some cases these data were soil concentrations; in other cases they were soil gas concentrations. Capital relies heavily on these data when making repeated conclusions in the Report about the absence of contamination at and near Plant 2. Yet, despite this reliance, no effort has apparently been made to even *bound* the quality of these older data. This adds to the already considerable uncertainty associated with the characterization of Plant 2 soil contamination. The consequences of this uncertainty are likely to be felt during later stages of site cleanup (the FS, remedy selection, etc.), when it will add to the difficulty in accurately determining the effectiveness and costs of cleanup technologies and alternatives.

25. Page 5-12, section 5.3.2.1. At the top of the page the Report states that the limited amount of pre-RI soil sampling at and near Plant 2 "adequately characterized the nature and extent of VOCs in soil." This may be Capital's position, but from Ecology's perspective the *adequacy* of these sampling results to characterize VOCs in the vadose zone beneath all of Plant 2 must be qualified. As Ecology has noted on a number of occasions, the primary concerns the Capital RI was designed to investigate were groundwater and (via vapor intrusion) indoor air contamination. The latter concern was addressed by assuming the Plant 2 subsurface was contaminated, and then investigating

areas within the Plant 2 building where indoor air VOC levels could possibly be elevated (and/or where receptors could be relatively more exposed to vapor intrusion impacts). The pathway was not addressed by sampling vadose zone soils in Plant 2 locations which had not been sampled pre-2008; no post-2008 effort was made to determine what effect contamination in these soils might be having on soil gas concentrations.

The former concern – groundwater contamination at and downgradient of Plant 2 – was investigated by focusing on groundwater itself. Again, the possibility that vadose zone soils in Plant 2 locations which had not been sampled pre-2008 were a significant source of continuing groundwater contamination was not addressed by sampling those soils. Instead, since

a) Plant 2 was an operating facility and access would be difficult for such sampling,
b) Capital did not want to sample Plant 2 soils during the RI, and
c) historical soil gas sampling results were favorable,[6]

a decision was made to track trends in shallow groundwater contamination at and immediately downgradient of the plant. By tracking these trends it was hoped that we could indirectly form an idea of whether residual soil contamination at Plant 2 was acting as a significant source of continuing groundwater contamination.

It is possible that no significant source of COCs is currently present in soils beneath Plant 2. But this critical assumption carries with it a considerable degree of uncertainty. Rather than confront and transparently acknowledge this uncertainty, Ecology believes the Report strives to unreasonably downplay the many unknowns associated with such a critical assumption.

The first full sentence is therefore only approved as part of the final RI Report with the following modification:

> "The location and number…from and near Capital Plant 2 *provide an indication of* the nature and extent of VOCs in soil."

26. Pages 5-12 and 5-13, section 5.2.3.1. According to Table 6, PCE was detected in soils at MW6, MW7, and B14 at concentrations exceeding Capital's groundwater-protective SLs. TCE was detected at MW2, MW6, and MW7 at concentrations exceeding SLs. However, the fourth through sixth paragraphs of 5.2.3.1 do not appear to mention MW2, 6, or 7.

    The fifth paragraph opens by stating that PCE was the only VOC detected in soils above SLs. Boring B14 is identified as the location for this exceedance, but later (in the sixth paragraph) the Report acknowledges that TCE was also detected in soils above the SL at ECS30. As noted above, the statement about PCE at B14 appears to ignore both the PCE soil SL exceedances at MW6 and MW7 (and the TCE SL exceedances at MW2, MW6, and MW7).

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[6] i.e., soil gas results did not suggest high levels of soil VOCs in the locations that were sampled. According to Figure 5, however, only one soil sample has ever been collected beneath the interior of Plant 2.

The fifth paragraph also states that since PCE was only detected above the SL at B14 at 2 feet (and not deeper), this PCE "is not an ongoing source of PCE to groundwater." Presumably, this is based on an assumption that if PCE concentrations immediately above the water table do not exceed SLs, shallower elevated concentrations do not pose a leaching threat. Ecology does not agree.

At the top of page 5-13 it is stated that the lateral extent of soil VOC concentrations exceeding SLs has been defined. Ecology was not sure if Capital was referring only to the eastern extent of contamination or the lateral extent in all directions. We agree that sampling has been performed east of MW6, ECS30, and MW7, and that resulting concentrations were below SLs. There do not appear to be sampling locations east of B14, however.[7] In other (than easterly) directions from MW6, ECS30, B14, and MW7, there are clearly areas where no sampling locations meaningfully bound the contamination detected at the four points.

The fifth and sixth paragraphs of 5.2.3.1 are therefore only approved as part of the final RI Report with the following modifications:

> "*PCE* was detected above the screening *level* for soil in boring B14 at 2 feet bgs. Concentrations of PCE…at 5 to 7 feet bgs.
>
> "The northern extent…(ECS 2005). The southern extent…B26 (Figure *6*). Although the lateral extent…has not been defined, the extent of *VOC* concentrations *exceeding* screening levels *in the eastern portion of Capital's property is bounded by ECS41, ECS40, ECS39, ECS38, and ECS28."*

27. Page 5-15, section 5.2.3.2. No groundwater SLs are presented for 1,1-DCE in Table 2. Ecology is therefore unsure how Capital determined that recon water table results are less than SLs (as stated in the second full bullet). **The second full bullet on the page 5-16 is therefore only approved as part of the final RI Report with the following modification:**

> "Concentrations of 1,1-dichloroethene…laboratory PQL and *trans-1,2-DCE was* below the screening *level*."

It is also unclear why 1,1-DCE is not mentioned in the shallow and intermediate zone discussions on this, and the following, page.

28. Pages 5-16 and 5-17, section 5.2.3.3. The Report states that shallow zone vinyl chloride concentrations exceeding the SL were bounded "east and southeast of the Capital Property…by…results…from borings B19 and B24." B19 was indeed located south of Capital, and a bit to the east of Plant 4. Perhaps this is the "southeast" boring the Report refers to. But B24 was located south and immediately east of the 1st Ave./East Marginal Way confluence, west of all Capital Plants other than Plant 5. **The last sentence on page**

[7] Nor does there seem to be a soil sampling location east of the Plant 2 canopy MW2 location.

5-16 is therefore only approved as part of the final RI Report with the following truncation/modification:

> "Concentrations of vinyl chloride…in the Shallow Zone *approximately 300 feet south*-southeast of the Capital Property were bounded by…groundwater *sample* collected from *boring* B19."

29. Page 5-17, section 5.2.3.3. Point of clarification: The Report states that intermediate zone vinyl chloride concentrations exceeding the SL were bounded both laterally and vertically by five direct push locations: B19, -21, -22, -24, and -27. Ecology agrees that the B22 and B27 locations likely served as boundaries, both laterally and vertically, for contamination immediately upgradient. We also agree that the B19, B21, and B24 locations likely served as boundaries, both laterally and vertically, for higher levels of contamination cross-gradient. However, this leaves some areas unbounded. For example,
    - vinyl chloride at B20 and B23 was not bounded laterally by the five points; and,
    - there was no lateral bounding location between B22 and B27 on the west side of East Marginal Way S.

30. Pages 5-19 and 5-20, sections 5.2.5, 5.2.6, and 5.2.7. These sections do not mention results for 1,1-DCE. As noted in Comments above, the FS swill need to clarify where (locations and depths) 1,1-DCE SLs are – and are not – likely to be exceeded.

31. Page 22, section 5.2.8. Point of clarification: Ecology agrees that reducing conditions are present in certain site groundwater areas, especially at depth. However, Capital's dissolved oxygen (DO) measurements were often high (> 1 mg/l). In fact, monitoring results indicate that DO levels at most wells exceeded 2 mg/l for at least one quarter. Measured ORP values rarely exceeded (were less than) -100 mV. Sulfate was frequently elevated (> 20 mg/l) in samples from water table zone wells, and exceeded 30 mg/l in samples from shallow wells CI-13-30 and 9-40. Capital may therefore characterize such an environment as "moderately reducing" and supportive of reductive dechlorination, but Ecology believes that a number of indicator measurements suggest groundwater conditions are far from ideal for *effective* reductive dechlorination.

32. Page 22, section 5.2.8. The Report notes that dissolved manganese concentrations at the water table ranged from 101 to 24,000 ug/l. Perhaps this is true, but Table 13 does not provide a higher dissolved Mn concentration than 980 µg/l.[8] If the 24,000 value was measured at a well not included on Table 13, the Report should have referenced the table or appendix where the data could be found. It should have also explained why dissolved concentrations should exceed measurements of total Mn by an order of magnitude.

    Similarly, the text states that the maximum dissolved Mn levels in the shallow and intermediate zones were 40,000 and 7460 µg/l, respectively. No shallow zone values in Table 13 exceed 1300 µg/l; no intermediate zone values exceed 760.

[8] Table 13 also lists a dissolved Mn level less than detection limits (11 ug/l). This is obviously lower than 101 ug/l.

In addition;

a) unless the data shown on Table 13 are not comprehensive (i.e., only constitute a subset of Capital's Mn+2 and Fe+2 data), it is not apparent that Mn+2 and Fe+2 "correlate" in all three groundwater zones – if this means that higher concentrations of one element coincide with higher levels of the other element too. As PSC noted in their comments on the Report: "since the data for iron and manganese are not plotted on any figures, it's not clear how CI reached conclusions about the areal distribution of iron and manganese or the correlation between dissolved species and HVOCs in groundwater;" and,

b) the Report should have compared Fe and Mn data measured in contaminated groundwater at and downgradient of Capital to measurements taken upgradient and in downgradient or cross-gradient areas either outside the "plume(s)" or where organic COC levels are low. One objective of the RI has been to determine if Capital releases have led to groundwater conditions favorable for Fe and Mn solubility and/or mobility.

In the FS Capital will need to resolve the apparent discrepancies between what is said in this section of the Report and the data provided in Table 13. In addition, Ecology expects the FS to: a) include a comparison of Fe and Mn data measured in contaminated groundwater at and downgradient of Capital to measurements taken upgradient and in relatively non-impacted groundwater samples; and, b) provide corresponding figures, identifying Fe and Mn sampling locations and measured concentration values.

33. Pages 5-25, section 5.2.10. The text states that the head differences for nested wells were negligible, indicating that vertical hydraulic gradient is not a factor in the vertical transport of contaminants. This statement should be substantiated and supported with a hydraulic head data summary when preparing the future FS Report. Ecology believes that a slight downward gradient may exist in most of the Capital RI study area during the winter months due to recharge from precipitation; a negligible vertical gradient is expected during the dry season. An upward gradient may exist near the Duwamish Waterway and Slip 2, however, due to the groundwater discharge pattern controlled by the Waterway's salt-water wedge. This upward gradient near the Waterway likely plays an important role for contaminant transport and discharge from deeper groundwater to the Waterway. Please also see Comment #58 (associated with Section 6.2.1.1) and PSC's enclosed comments.

34. Pages 5-25 through 5-27, section 5.2.11. In the discussions of groundwater flow direction on these pages it was not always clear to Ecology how "to the southwest" might differ from "towards Slip 2," if at all. A better description of flow direction per zone would have clearly explained which contaminated sub-areas in the RI study area are likely to be: (1) predominantly upgradient of the Waterway, but not Slip 2; (2) predominantly upgradient of Slip 2, but not the main Waterway channel; and, (3) upgradient of both receiving bodies.

As PSC's comments noted: "On Page 5-26, the 2012 Draft RI Report states, "Groundwater flow direction is to the southwest toward the LDW. Little or no deflection of the groundwater flow direction toward Slip 2 is noted." However, on the following page (Page 5-27), the report states, "Although minor variations in flow direction occur as a result of tidal influence, the flow direction within the Capital Area of Investigation remains predominantly southwest toward Slip 2 of the LDW during a tidal cycle. The report appears to present a contradictory analysis of groundwater flow direction in the vicinity of Slip 2."

When preparing future FS documents Capital should improve upon the RI's description of the flow directions that form the basis of the company's groundwater conceptual model. This will require focusing not only on zones (depths), but also on particular areas south and west of the Capital property.

35. Page 5-28, section 5.2.11. Point of clarification: The text states that the hydraulic conductivity estimates using both tidal data and slug test data indicate high hydraulic conductivity (K) of 100 to 200 ft/day for the Water Table and Shallow Zones. Ecology agrees. However, lower K values (32 ft/day for WT zone and 28.3 ft/day) were used for the Water Table and Shallow Zones in the fate and transport modeling. During the FS higher hydraulic conductivity values should be used to model the base case. Please see Comment #70 below (on Section 6.2.5) and PSC's enclosed comments.

36. Pages 5-28 through 5-40, section 5.3. Point of clarification: Section 5.3 is a good section of the Report and Ecology has only a few comments.

    Since 2008 the "IPIMALs" have changed for several VOCs. Ecology reviewed Capital's VI assessments as they were prepared and submitted, and understands the values have changed since that time. But a reader of the RI Report, referring to Table 3, could easily be confused by section 5.3 conclusions that were reached *at the time* a Tier 3 assessment was completed. If the Report's authors thought it was important to include Tier 3 assessment conclusions that were made shortly after Tier 3 sampling was completed, it would have been wise to also – perhaps in section 7.1.7 – revisit these conclusions (since the IPIMALs for PCE, TCE, and cis-1,2-DCE have all changed over time). For the FS, the focus should consistently be on the best (most up-to-date) estimates of current and future risk via the respective pathway.

    In addition, as Capital correctly notes, the "IPIM" process was founded on the assumption that shallow groundwater is the potential VI source. Contaminated soils can also be a source, though, and that is why we have evaluated buildings in Capital's study area located above or near soils contaminated with volatile COCs. Capital's Table 1 soil SLs, protective of indoor air, are those concentrations that are protective of groundwater quality, which could then act as a VI source. Ecology agrees that when soils are contaminated with VOCs, one concern is that these VOCs will leach to shallow groundwater. This groundwater can then become a potential VI source. But

contaminated soils can also be a direct VI source (i.e., directly contaminate soil gas); Capital has not proposed soil SLs for this migration and exposure pathway.

There are at least two approaches for ensuring soil levels are protective of future indoor air quality:[9]

a) comparing soil cleanup levels established to be protective of groundwater as a drinking water source to site soil data (as discussed in regulations; please see WAC 173-340-740(3)(b)(iii)(C)); or,

b) identifying soil gas screening levels which would be protective of indoor air quality. When using this approach, protective soil concentration values do not need to be identified. Instead, measurements of soil gas are used to indicate that soil contamination is below levels that may pose a threat to indoor air. In other words, once protective soil gas levels are measured, soil concentrations protective of indoor air quality are presumed to be achieved.

While Table 1 soil SLs protective of groundwater quality are low concentrations, it cannot be assumed these levels will also protect indoor air from soil gas VOC levels directly caused by soil volatilization. In the FS Capital should therefore select an approach for developing soil SLs, fully protective of indoor air quality, that can then be used during the analysis of site remedial alternatives.

37. Page 5-30, section 5.3.1. Point of clarification: The first paragraph after the bullets states that Plant 2 was not assessed via Tier 3. However, as the first bullet on the page correctly notes, a Tier 3 evaluation was performed for the Plant 2 QC and Laser office.

38. Page 5-35, section 5.3.2. The Report refers to IPIMAL values for cis-1,2-DCE in the first and last paragraphs. As noted in comments on Table 3, cis-1,2-DCE currently has no MTCA air cleanup levels and, hence, no IPIMALs. **The two sentences are therefore not part of the final approved RI Report.**

39. Page 5-38, section 5.3.2. The third paragraph of the Report states that the "NCCEF values were 0 for all three samples." However, the carcinogens PCE and TCE also act as non-carcinogens, and since they were detected indoors, the NCCEF cannot be zero. **The second sentence of the third paragraph is therefore not part of the final approved RI Report.**

40. Pages 5-38 and 5-39, section 5.3.2. Point of clarification: PCE and TCE were detected in indoor air samples collected at the Gull building. Ecology assumes these detections are due, at least in part, to VI. The first full sentence on page 39 would be better stated

[9] Contaminated soils can lead to contaminated soil gas via two routes: (1) soil contamination can directly volatilize into vadose zone soil gas, and (2) soil contamination can leach, contaminating shallow groundwater. Contaminated groundwater can then volatilize into vadose zone soil gas. The discussion in this comment is referring to the first route.

then as: "The results of the Tier 3…soil gas samples collected beneath the building slab are not adversely affecting indoor air …index of 1."

41. Page 5-39, section 5.3.3. Point of clarification: Ecology agrees that utility corridors, side sewers, and drainage laterals may act as preferential soil gas pathways. However,
    - depending on their depth below ground surface, they may also – or instead – act as preferential shallow groundwater pathways; and,
    - these preferential pathways may also exist in areas where buildings have not been "targeted for Tier 3 VI Assessments."

42. Page 5-40, section 5.3.3. In the first full paragraph the Report notes that the sewer main is a 27" diameter line located 10-15 feet below ground surface, "below the top of the water table." At this depth Capital believes it would not act as a preferential soil gas pathway. This may be Capital's assumption, but 10 feet bgs is very close to the top of the water table. Buried piping or other manufactured conduits may serve as preferential soil gas pathways *themselves*. But often it is the bedding material that acts as the pathway. The Report does not note if non-native bedding extends above the sewer main, or what type of bedding or other materials should be expected directly above the main. **The last sentence of this paragraph is therefore only approved as part of the final RI Report with the following modification:**

    "Because the combined…the water table, it *is unlikely to* act as a *significant* preferential pathway for soil gas."

    In addition, Appendix G – the "side sewer cards" – provides only three 8½ X 11" sheets, which supposedly show lines running along Fidalgo, their connection points, and branch lines leading a few feet north and south of Fidalgo. Appendix G contains no explanatory notes, no discussion of why Capital focused (and only focused) on the areas shown on these sheets, or even an explanation of how the sheets are geographically oriented to one another. During the FS Ecology expects Capital to develop a better depiction of the known subsurface utilities that are present across the entire site area.

43. Page 5-40, section 5.3.3. In the last paragraph of this section the Report properly acknowledges the uncertainty associated with side sewers and preferential soil gas VOC movement. However, as noted in comments above and Ecology's comments on the draft RI Report, preferential pathways are also possible in areas where buildings have not been "targeted for Tier 3 VI Assessments." **The last paragraph of section 5.3.3. is therefore only approved as part of the final RI Report with the following addition (following the last sentence):**

    "It is also uncertain what levels of COPCs in soil gas are present beneath buildings not targeted for Tier 3, such as the multi-tenant warehouse building due south from the Beckwith and Kuffel building. Capital Industries has not yet determined if the indoor air in these more southerly buildings may be impacted by vapor intrusion due to the presence of subsurface or foundation-related preferential pathways."

44. Pages 5-40 through 5-42, section 5.4 (and Appendix E). As noted in sub-section 5.4.1, Appendix E contains copies of validation reports associated with Farallon's data collection efforts. Ecology appreciates this information and agrees that the validator found few problems with these datasets. The discussion of data quality in the revised Report improves upon the draft Report's discussion. *Validating* data and *assessing project data quality*, however, are not synonymous. During the FS Capital will be developing remedial action objectives (RAOs) and then cleanup action alternatives, consistent with those RAOs. The alternatives will be compared to each other to determine which cleanup action should be selected. In each of these FS phases – establishing RAOs, developing remedial alternatives, and evaluating remedial alternatives – it will be important to have a firm grasp on how usable the site data are (and for what purposes). For certain media and media measurements Capital will likely need to go beyond the RI Report's brief assessment of quality, especially with respect to judging the current representativeness of those critical non-groundwater monitoring data serving as the basis for the company's conceptual model of site soil and groundwater contamination.

    Ecology's only other comment on section 5.4 relates to sub-section 5.4.3. Here, Capital states that direct push groundwater sampling data (recon data) are not "directly comparable" to monitoring well data and the former's primary purpose is to "identify data gaps…, define source areas, and guide the location of monitoring wells." Ecology agrees with much of this, and we realize that many direct push sampling locations have only been sampled once, but Capital should not have omitted mention of the plume-characterization role for direct push data. Both Capital and Ecology have relied on direct push data to supplement well data as we have formed our three-dimensional conceptual picture of groundwater contamination in the study area. This is especially the case in locations – and at depths – where no monitoring wells have been installed in the immediate vicinity. Where we are relying on these data, their quality – including the representativeness – must be estimated or at least bounded. And the quality and utility of recon data points being used to help estimate the <u>current</u> nature and extent of groundwater contamination, because those points only represent a moment in time, must be re-assessed as we proceed and the data ages.

<u>CONCEPTUAL SITE MODEL</u> (6)

45. Page 6-2, section 6.1.1.1. As noted in comments above, PCE was detected in soils at MW6, MW7, and B14 at concentrations exceeding Capital's groundwater-protective SLs. TCE was detected at ECS30, MW6, and MW7 at concentrations exceeding SLs. **The last sentence of the first paragraph and the first sentence of the second paragraph of this section are therefore not approved as part of the final RI Report.**

46. Page 6-2, section 6.1.1.1. The extent of contamination in soils west of ECS30, MW7, and B14 has not been "bounded" by measurements. Nor have these points been bounded

in some other directions. **The last sentence of the second paragraph of this section is therefore not approved as part of the final RI Report.**

47. Page 6-3, section 6.1.1.2. TCE was detected above the soil SL at MW2. **The first sentence on the page is therefore only approved as part of the final RI Report with the following addition:**

> "conducted during the excavation…Plant 2 canopy, *with the exception of the detection of TCE at one depth interval at MW-2.*"

48. Page 6-3, section 6.1.1.2. The second, third, and fourth full paragraphs on this page discuss the Plant 2 source area. The Report states that VOCs were not detected in 2004 via PID. However, later (the next paragraph) Capital says that soils "with elevated PID readings" were stockpiled. There is no explanation provided for this apparent inconsistency.

The second paragraph states that detections of VOCs in soils at MW2 and three other points were found at depths no shallower than 8.5' bgs. Capital believes these detections are "representative of groundwater conditions…". As noted in Comment #18, the 8.5'-9' depth interval at MW2 is very close to the depth of the water table. Capital may be correct that TCE concentrations detected in soil at 8.5'-9'are solely due to the migration of groundwater contamination into the MW2 area, but this has not been demonstrated. TCE was not detected (with a reporting limit of 5.9E-4 mg/kg) at MW2 in a sample collected 2.5 feet deeper (at 11'-11.5'); if groundwater were solely the source of the higher detection at a slightly shallower depth, why would the difference in soil concentrations be so great (a more than 200 times difference)?

The third paragraph states that most of the soil beneath Plant 2 "was excavated." Perhaps this is true, but "most of the soil beneath Plant 2" was clearly not excavated and disposed of off-site if only 330 yds was the total amount removed from the property. Please see our related comments above.

The fourth paragraph reports that no analytical results indicate that VOC concentrations in soils exceeding SLs remain beneath Plant 2 or the canopy area. For those soil locations actually sampled beneath Plant 2 and the canopy, which were very few, Ecology agrees that the lone exception is MW2. It is also the case, though, as we have noted above, that TCE and PCE soil SLs have not been developed to protect indoor air quality from direct soil-to-soil gas volatilization.

The second, third, and fourth full paragraphs on page 6-3 are therefore only approved as part of the final RI Report with the following modifications:

> "Subsurface soil conditions…, and below. Concentrations of VOCs…ECS 2005). Concentrations of VOCs…ranging from *29.5* to 34 feet bgs in boring locations B1, B2, *and B5. These depths are within* the saturated Shallow Zone and *the*

elevated detections are considered to be representative of groundwater conditions (Farallon et al. 2008).

"*Capital believes that* most of the soil beneath…Capital Plant 2. Soil with…HVOCs. Approximately 330…construction sites…Approximately 19…for HVOCs. Stockpiled soil…(FSM 2004).

"*No results from soil samples collected* beneath Capital Plant 2 or the Capital Plant 2 Canopy *indicated that VOCs were present at concentrations exceeding screening levels, except for the 8.5-9 feet bgs sample at MW-2.*"

49. Page 6-4, section 6.1.2.1. Point of clarification: Ecology agrees that the Art Brass facility appears to be located *generally* upgradient of Capital Plants 1 and 5. However, the Report should have included more specific discussions of hydraulic and chemical data (e.g., groundwater elevation contours and iso-concentration maps specific and detailed enough for the area) to support assertions that the Art Brass facility is a contributing source of vinyl chloride in the shallow and intermediate zones at the two Capital Plants. The context for discussions of the conceptual site model for any particular area/source should be related to the specific hydrogeologic setting and chemical distribution.

    In comments received from Art Brass (please see Enclosure C) the company noted that vinyl chloride "in groundwater is an area-wide issue…", but "well cluster MW-17 and borings SPO-17, SPO-18, and SPO-19 are located cross-gradient of Plant 5," not upgradient. Art Brass also pointed out that "data collected from probe PSC-K23, located about 500 feet east in the CI Plant 2 canopy area, indicates a significant amount of vinyl chloride in groundwater upgradient/cross-gradient of the PSC-CG-141 well cluster. In the Shallow Interval at PSCK23, vinyl chloride concentrations range up to 597 µg/L, more than twice the concentrations observed at the PSC-CG-141 well cluster, with total chlorinated ethene concentrations of up to 10 µmol/L." The PSC K23 data were collected 10 years ago, but as Art Brass notes: "concentrations of vinyl chloride at PSC-CG-141 at that time [2002] were similar to what was detected in recent samples."

50. Page 6-5, section 6.1.2.1. At the end of this section the Report states that the lack of detections at CG141-WT is confirmation that there has not been a release at Capital Plant 1 or 5. Ecology agrees that 141WT is well-situated to intercept groundwater contamination resulting from a release at Plant 5. It is less suited to fulfill that purpose for most of Plant 1; moreover, no samples from any individual well can *confirm* the absence of a release. **The last sentence of 6.1.2.1 is therefore only approved as part of the final RI Report with the following modification (truncation):**

    "Concentrations of COPCs…monitoring well cluster CG-141."

51. Page 6-5, section 6.1.2.2. The last paragraph here identifies Blaser well BDC11-40 as one of those wells located "upgradient of Capital Plant 2…" Ecology disagrees; the well is likely to be upgradient of at least part of the Canopy area, but not Plant 2.

In addition, Ecology does not agree that results from the four wells referred to here (BDC11-40, 6-30, 3-40, and CIMW1-40) "confirm that vinyl chloride released at the BDC facility has migrated to…" Plant 2 and the canopy area. Samples collected from these four wells provide information about vinyl chloride contamination but do not, by themselves, establish the source of that contamination. Capital may be correct that releases at Blaser have contributed to vinyl chloride levels at the four wells, but the data from the four wells do not *confirm* this.

The last paragraph is therefore only approved as part of the final RI Report with the following modification (truncation):

> "Concentrations of vinyl chloride…from the *Shallow Zone* in..., all of which are located upgradient of Capital Plant 2 *and/or* the Capital Plant 2 Canopy and downgradient of the BDC facility (Figures 19 through 25). These results *indicate* that *upgradient* vinyl chloride has migrated to Capital Plant 2 and the Capital Plant 2 Canopy area in the Shallow Zone."

52. Page 6-6, section 6.1.2.2. The first paragraph here identifies Blaser well BDC11-60 as a well located "upgradient of Capital Plant 2…" Ecology disagrees; the well is likely to be upgradient of at least part of the Canopy area, but not Plant 2.

    As noted in comments above, Ecology also does not agree that results from the four intermediate zone wells referred to here "confirm that vinyl chloride released at the BDC facility has migrated to…" Plant 2 and the canopy area. Capital may be correct that releases at Blaser have contributed to vinyl chloride levels at the four wells, but the data from the four wells do not *confirm* this.

    The paragraph is therefore only approved as part of the final RI Report with the following modification:

    > "Concentrations of vinyl chloride… upgradient of Capital Plant 2 *and/or* the Capital Plant 2 Canopy and downgradient of the BDC facility (Figures 26 through 33). These results *indicate* that *upgradient* vinyl chloride has migrated to Capital Plant 2 and the Capital Plant 2 Canopy area in the Intermediate Zone."

53. Page 6-7, section 6.1.3. As the two sentences which follow the section title correctly state, "potential sources" are discussed in this section. **The section title is therefore only approved as part of the final RI Report with the insertion of "Potential" between "Other" and "Source."**

54. Pages 6-7 and 6-8, section 6.1.3.1. The Report states that there is likely a "separate source of HVOCs in soil" beneath the 5815 4th Ave. S. "north" building. This soil source is, in Capital's opinion, "separate and distinct from the Plant 4 source." The evidence for this assertion seems to primarily be the elevated soil gas concentrations measured sub-slab and the relatively low detections of VOCs measured by ECS in soils along the eastern side of Plant 4.

Ecology agrees that soil contamination below the 5815 4th Ave. S. "north" building is possible and it is also possible that such contamination is due to a release that is not associated with Plant 4. However, at this point these possibilities can only be considered suspicions. Though not mentioned in the Report,

- the building appears to only be about 30 feet northeast of ECS30 and MW6, where TCE and PCE were detected in soils at elevated levels. Contaminated soil gas associated with Plant 4 soil contamination at MW6/ECS30 could extend this far east; and
- TCE and PCE have been present in groundwater samples collected from MW6. They were also present in groundwater samples collected from ECS38 and -39. While the sub-slab detections at 5815 4th Ave. S. may be due, primarily, to a soil source, shallow groundwater is also likely contributing to these measurements.

The first sentence of the first paragraph and the fourth paragraph of 6.1.3.1 are therefore only approved as part of the final RI Report with the following modification:

> "The results of the Tier 3…indicate *it* is *possible that* HVOCs *are present* in soil beneath the building."
>
> [4th paragraph]
> "The nature and extent of…Tier 3 VI Assessment suggest *to Capital* that there is a…North Building. Soil samples have not…building slab. However, the evidence suggests *the possibility of a* source of PCE and TCE *that may be* separate and distinct from the Plant 4 source. The nature…has not been determined."

55. Pages 6-8 and 6-9, section 6.1.3.2. The Report states that Capital's groundwater monitoring has "identified a source of HVOCs to groundwater on the CalPortland Property…" PCE was detected in samples from well 17WT at a concentration of 5.2 µg/l in May 2012,[10] and Capital believes this measurement "indicates a release of PCE and TCE on the CalPortland Property." Neither compound has been detected in samples collected from well 17-30.

    The Report notes that PCE, TCE, and cis-1,2-DCE have not been detected above PQLs at wells 13WT, 16WT, or 18WT. Though TCE was detected at point B23, generally upgradient of both 17WT and 13WT, PCE was not.[11] Capital may therefore be correct that a more local source is responsible for the PCE, and perhaps even the TCE, detected at 17WT. Sources other than a release at CalPortland, however, are also certainly possible. The Report does not appear to include any documentation showing that either PCE or TCE was used/managed in the immediate area of well 17; nor does it contain documentation indicating there has been a solvent release in this area.

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[10] In June the well was re-sampled and the PCE level was less than 1 µg/l.
[11] The water table concentration of TCE at B23 was 2.9 µg/l. At 17WT it has been approximately 2 µg/l.

Wells 16WT, 17WT, and 18WT are new; they have only been sampled in May/June of 2012. It is hard to predict what levels of TCE and PCE will be detected at these wells in the future. **The first, third, and fourth paragraphs of 6.1.3.2 are therefore only approved as part of the final RI Report with the following modifications:**

"The results of the…RI have identified *the possibility of* a source of…(Figure 2). The CalPortland…Slip 2."

[third and fourth paragraphs]
"Water Table Zone
"Concentrations of PCE…(Figure 16). Concentrations of…CI-17-WT. The detection of PCE in groundwater in the Water table Zone…CI-17-WT, which *was* not detected in…indicates *the possibility of* a release on the CalPortland property.

"Concentrations of PCE and TCE…CI-17-WT upgradient wells. The detection of concentrations of PCE in groundwater in the…CI-17-30 indicates *the possibility of* a release on the CalPortland property.

56. Page 6-10, section 6.2.1. The second paragraph of this section does not mention 1,1-DCE. Please see Comment #13 above.

In addition, though it seems unlikely that 1,4-dioxane was released to soils and/or groundwater at the Capital property, Ecology does not believe the evidence collected to date in the study area verifies this. Dioxane was sometimes added to TCE in the past as a solvent stabilizer (though more frequently it was added to 1,1,1-TCA). In any case, its presence in groundwater from an upgradient source should not be used to define the compound as a "secondary COPC." Secondary COPCs are better identified as those substances, like iron and manganese, which were not released (by any PLP), but may be elevated due to groundwater geochemical conditions caused by the release of other substances.

The last two sentences of the second paragraph are therefore only approved as part of the final RI Report with the following modifications:

> "Iron and manganese are contaminants…not considered primary COPCs. Concentrations of iron and manganese are considered secondary COPCs. *Capital also believes that 1,4-dioxane was not released on the Property.*"

The first sentence of the third paragraph is only approved as part of the final RI Report with the following modification:

> "The Agreed Order…Capital Site; however, *Capital believes* that operations at the Capital Property have not…source of 1,4-dioxane."

57. Page 6-11, section 6.2.1. Point of clarification: The last sentence before sub-section 6.2.1.1 states that the nature and extent of the primary COPCs "would be indicative of the

nature and extent of the secondary COPCs." Assuming the secondary COPCs are iron and manganese, Ecology is unsure what Capital means here. We would not necessarily expect iron and manganese groundwater concentrations to track with cVOC levels in each zone and the Report does not seem to provide figures supporting Capital's claim.

58. Page 6-12, section 6.2.1.1. The text states that vertical gradients are interpreted to be moderate and variable between aquifer zones, and likely have little impact on contaminant migration. This statement is too general, in our opinion, and **the second part of the first sentence of the first full paragraph is not approved as part of the final RI Report**. Ecology believes that moderate vertical gradients, either downward or upward, will have a significant impact on contaminant migration. The cVOC source releases at Capital most likely occurred in the vadose zone. Nevertheless, contaminants have apparently migrated vertically to depths in the Intermediate Zone of 70 feet bgs. In addition, an upward hydraulic gradient near the Waterway and Slip 2 may play an important role in contaminant transport and discharge from deeper parts of the aquifer to the shallow and WT zones (and, ultimately, to the Waterway).

59. Pages 6-12 and 6-13, section 6.2.1.2. Point of clarification: On both of these pages the Report mentions soil gas contamination due to groundwater volatilization. It should have also mentioned soil gas contamination resulting from the direct volatilization of contaminated soil. Please see Comment #36.

    In addition, the last sentence of 6.2.1.2 includes a somewhat confusing statement regarding diffusion. Ecology's view is that shallow groundwater contamination – in areas where vadose zone soils are not also contaminated – can act as a VI source. The *strength* of this source is dependent on several variables, but Ecology agrees that once VOCs have volatilized from the groundwater into soil gas, VOC-molecule transport is primarily governed by diffusion until VOCs approach the ground surface or a building's subsurface "pressure envelope."

60. Pages 6-12 and 6-13, section 6.2.1.2. The last paragraph on page 6-12 states first that no "residual source of COPCs in soil" was detected out of 75 samples located on the Capital property. It goes on to say that COPC concentrations exceeding SLs were detected in 1 of the 75 samples. This seems inconsistent. Plus, Ecology disagrees that the RI has only identified one location where groundwater-protection soil SLs have been exceeded (please see our comments above). **The two sentences in the paragraph are therefore not included as part of the final, approved RI Report.**

61. Page 6-18, section 6.2.2. Point of clarification: Ecology agrees that compounds indicative of reductive dechlorination have been detected in Capital's RI study area. However, levels of vinyl chloride in the Water Table zone have been very low. According to Table 10 the highest 2012 vinyl chloride measurement was found at well 12WT, a concentration of 3.6 µg/l. This well is located far from the Capital property, on the west side of East Marginal Way. The Report should have either noted that

dechlorination to vinyl chloride, within the study area, may be very slow, or provided evidence supporting an alternative hypothesis.

62. Pages 6-18 through 6-21, section 6.2.2.1. Point of clarification: Capital's groundwater DO measurements were often high (> 1 mg/l). DO levels at many wells exceeded 2 mg/l for at least one quarter. The exceptions to this observation in water table wells were MW3; 16WT and 19WT (each only sampled twice, and not during the winter); and, CIMW1-WT (which has not been sampled during December). Negative ORP values rarely exceeded (were less than) -100 mV. The exceptions were wells 141WT and 11WT (where readings were < -100 only 1 quarter out of 5), and 19WT, which was only sampled during the spring/summer of 2012. In Ecology's opinion, these measurements do not reflect site groundwater conditions reductive *enough* to effectively sustain significant dechlorination past the degradation of PCE and, perhaps, TCE.

    In the shallow zone elevated DO measurements (> 0.5 mg/l) were common. The primary exceptions to this were at wells CI-16-30, 17-30, 18-30, and 19-30, none of which has been sampled during July through April. It is hard to understand, then, why Capital believes dissolved oxygen in this – and the WT – zone is "essentially depleted." In addition, negative ORP values rarely exceeded (were less than) -100 mV at any well. While Ecology does not disagree that reductive declorination may nevertheless be occurring, the Report should have noted those observations which do not favor, and may perhaps even suggest suppression of, effective reductive dechlorination.

    Ecology agrees that the intermediate zone appears to be more reducing than shallower depths; this is typical within the Duwamish Valley. It is possible, then, that sulfate is being reduced, though sulfide was never detected. It is also possible that ethene/ethane are being generated, though again, despite what the text states on page 21, Table 13 indicates that neither have been detected. Chloride levels at the intermediate depth are a bit higher than those found in the shallow zone, but Ecology does not concur that this suggests that "complete reductive dechlorination of PCE and/or TCE is occurring," unless by this Capital only means that the two compounds could have been degraded to less highly-substituted ethenes.

63. Pages 6-24 and 6-25, section 6.2.4.1. In this sub-section Capital discusses COC detections in water table zone wells. The Report notes multiple times that contaminants have not reached the Duwamish Waterway. Ecology agrees that COCs have not been detected at wells 13WT, 16WT, 18WT, and 19WT. Three of these four wells, however, were only sampled in May and June of 2012; it is therefore premature to draw a confident conclusion about how high current concentrations may be during other times of the year.

    COCs have been detected at Well 17WT, just east of Slip 2. Concentrations are relatively low, but suggest that PCE, TCE, cis-1,2-DCE, and vinyl chloride are reaching surface water. Capital may be correct that a release on the CalPortland property has led to the contamination, or part of the contamination, detected at 17WT. At this point,

however, as Ecology has noted in Comment #55, identifying CalPortland as the source is premature and speculative.

The second and third paragraphs of 6.2.4.1 are only approved as part of the final RI Report with the following modifications:

> "The COPC data indicate…in the Water Table Zone. The TCE plume…*towards* wells CI-14-WT and CI-13-WT. Wells *CI-17-WT*, CI-16-WT, CI-18-WT…in the Water Table Zone. The concentrations of…in up-gradient wells, *suggesting* a *possible* separate source on the CalPortland property. The distribution of…Capital Property. Low concentrations…well 11-WT. The PCE plume…of the Capital Property. No COPCs *were* detected in sentry wells *CI-16-WT, CI-18-WT, or CI-19-WT in May and June of 2012.*
>
> "The COPC maps indicate…monitoring period. COPCs at concentrations… have not *been detected in downgradient monitoring wells CI-13-WT, CI-16-WT, CI-18-WT, or CI-19-WT."*

64. Pages 6-24 and 6-25, section 6.2.4.2. This sub-section of the Report is devoted to a discussion of COC detections in shallow zone wells. In the second paragraph of 6.2.4.2 Capital states that contaminants in this zone have not reached the Duwamish Waterway. Ecology disagrees; Figure 8 clearly shows COC detections in wells at the river bank.

    Ecology agrees that COCs have not been detected at wells 13-30, 16-30, or 18-30. Wells 16 and 18 are new, however, and were only sampled in May and June of 2012. It is premature to draw a confident conclusion about how high current concentrations may be during other times of the year. Furthermore, 16-30, 18-30, and 19-30 (where vinyl chloride was detected) are not the only wells "nearest…to the LDW…" Well 17-30 (where TCE or vinyl chloride was detected[12]) is also near the Waterway (Slip 2).

    The second paragraph of 6.2.4.2 is only approved as part of the final RI Report with the following truncation and modifications:

    > "A TCE plume…and CI-14-35. The plume is… to an area *towards* well CI-13-30. Wells *CI-17-30*, CI-16-30, CI-18-30, and CI-19-30 are…Shallow Zone. No TCE *was* detected in wells CI-16-30 or CI-18-30 *in May and June of 2012.*"

65. Page 6-26, section 6.2.4.2. The identified sources for detections of vinyl chloride at CI wells 19-30 and 17-30 reflect Capital's opinion, based on the company's interpretation of site data. Ecology has not formed the same conclusions.

    Please note: in Art Brass's comments on Capital's Report they stated that they did not agree that well CI-19-30 represents "the southern edge of the vinyl chloride plume from the ABP Facility." Art Brass believes the low vinyl chloride concentrations detected

[12] Figure 8 indicates TCE; Table 10 indicates vinyl chloride.

recently in samples from this well are "consistent with the diffuse area-wide vinyl chloride plume attributable to multiple sources."

The first full sentence on the page and the following sentence are therefore only approved as part of the final RI Report with these modifications:

> "*Capital Industries believes the* vinyl chloride detected...the ABP facility. Vinyl chloride...property and *Capital Industries believes this* likely represents...Water Table Zone."

66. Page 6-26, section 6.2.4.3. The first paragraph of this section states that TCE was not detected in intermediate zone monitoring wells at concentrations exceeding SLs. As noted in comments received from Environment International, "TCE was detected above screening levels in June 2010, according to [the] isoconcentration map for [the] intermediate zone (now Figure 27)..." A TCE concentration of 98 µg/l was measured in groundwater collected from well 137-50.

    Environment International also noted that "the figure references in the first paragraph of section 6.2.4.3 are wrong..." Instead of referring to Figures 26 through 33 in the first sentence, the Report refers to Figures 17 through 21.

    In addition, the second paragraph of the section refers to increasing vinyl chloride concentrations "to the northwest (monitoring well CI-141-50)." Ecology agrees that higher intermediate zone vinyl chloride levels have been detected in the western part of the RI study area. But the better parenthetical reference here would have been Figure 9. Although vinyl chloride levels at well 141-50 have been elevated (the figure says the max concentration has been 110 µg/l), higher levels have been detected at B10, B11, and at well 15-60. The latter two locations are south of well 141-50 and Fidalgo St.

    The first paragraph of 6.2.4.3 is therefore only approved as part of the final RI Report with these modifications:

    > "The interpreted distribution...plan view on Figures *26* through *33*. These maps illustrate...Intermediate Zone. PCE *was* not detected in monitoring wells exceeding...Intermediate Zone. The COPC...35 through 37."

67. Page 6-26, section 6.2.4.3. This sub-section discusses COC detections in intermediate zone wells. In the second paragraph of 6.2.4.3 Capital states detections at well 141-50 are likely due to a source at the "ABP Facility." Capital may be correct, but Ecology has not reached the same conclusion.

    Later in the paragraph it is stated that contaminants in the intermediate zone have not reached the Duwamish Waterway. Again, Capital may be right, but there are few intermediate zone wells located close to the Waterway to confirm this assertion. Low levels of vinyl chloride have been detected upgradient of the Waterway at wells 13-60, 17-70, and 12-60. The compound was detected at higher levels at direct push points B20

and B23, and at well 15-60. A better conclusion, from Ecology's perspective, is that *based on the RI data, vinyl chloride at this depth is unlikely to be currently discharging to the Waterway at concentrations exceeding the SL.*

In addition, the statement locating the vinyl chloride plume "between monitoring wells CI-15-60 and CI-12-60," even if referring only to concentrations exceeding the SL, appears to ignore DP data from points B20 and B23.

The first three sentences of the second paragraph of 6.2.4.3 are only approved as part of the final RI Report with the following truncation and modifications:

> "The vinyl chloride data…, indicating a likely source up-gradient and to the northeast. Vinyl chloride…Intermediate Zone, but *concentrations at CI-12-60, 13-60, 14-70, and 16-60 are currently below the screening level.* The vinyl chloride *plume appears to extend generally southwest to areas just west of East Marginal Way South.*"

68. Page 6-27, section 6.2.4.3. Point of clarification: Perhaps it is a minor point, but Capital does not know if "COPCs exceeding screening levels have…reached beyond sentry wells CI-13-60 or CI-16-60." The company may assume this, but intermediate zone groundwater downgradient of these two points has not been sampled.

69. Page 6-30, section 6.2.5.1. Point of clarification: A well "CI-14-40" is identified for Shallow Zone Source 2 in the second bullet, which may be a typographical error (this is what Ecology has assumed). Based on the specified distance (1,050 feet) to the Waterway and Table 15, the source well should be CG-141-40.

70. Page 6-30, section 6.2.5.1. Point of clarification: The text states that the hydraulic conductivity (K) value used for the modeling is the average (geometric mean) of the selected available K estimates. The K values calculated for the Water Table and Shallow Zones, however, appear to be below the range of K values derived from the slug tests and tidal study, specified on page 5-28. As PSC has noted (see their enclosed comments): "The report's analysis of the sensitivity of the BIOCHLOR model indicates that the model results are sensitive to changes in the hydraulic conductivity. The use of hydraulic conductivity values that are lower than values stated in the report as representative of the CI Investigation Area is likely to result in model predictions that are not conservative and that underestimate the potential concentrations of contaminants that could reach the Duwamish Waterway."

    Ecology agrees with PSC's comment. Although we have not requested that Capital re-run the BIOCHLOR model during the RI with higher and more representative K values, more representative K values should be used in future FS modeling.

71. Page 6-31, section 6.2.5.1. Point of clarification: Ecology agrees with the methodology used to calculate longitudinal dispersivity using the Xu and Eckstein Equation. However, the plume length of 1,730 feet is larger than the distances between the Waterway and all

three modeled sources. Larger dispersivity values will underestimate the potential discharge concentrations that could reach the Waterway from the three source areas. In future FS modeling, the distances from each source area should be used to calculate dispersivity values.

72. Page 6-34, section 6.2.5.2. The last sentence of the second paragraph states that BIOCHLOR modeling simulations are conservative (since Capital has chosen to use a continuous source term and long half-lives) and do not account for tidal mixing that will dilute COPC concentrations before they enter the Waterway. While Ecology agrees that some conservatism is associated with Capital's source term selection, we consider this both necessary and reasonable when using analytical/screening models such as BIOCHLOR.

    The selected half-lives, in our opinion, are not necessarily conservative. Given the persistence of cVOCs in groundwater after many years following the primary source release(s) and secondary source removal, actual degradation rates for certain dechlorination steps may be slower than Capital expects.

    In addition, tidal mixing near the Waterway was not characterized during the RI. The statement concerning dilution of COPC concentrations by tidal mixing is therefore, in our view, a general hypothesis, not demonstrated by RI measurements obtained at this site. One could also state – as a general hypothesis – that the modeling does not account for preferential pathways, which will have the effect of increasing COPC groundwater levels discharging to the Waterway. Again, RI characterization to date has not confirmed or refuted such a hypothesis for this site.

    For these reasons the last sentence of the second paragraph is not part of the approved RI Report.

73. Page 6-34, section 6.2.5.2. Ecology is not opposed to the additional modeling Capital performed, using alternative source terms. As a form of model sensitivity analysis this may have been appropriate. However, we do not agree that a decaying source is necessarily more "realistic". Even though dissolved-phase cVOCs may eventually attenuate after all secondary sources are depleted, Capital's RI data are not adequate to identify a decaying or decreasing trend for the site area's dissolved plumes. **The second sentence of the third paragraph: "Although…dispersion," is therefore not approved as part of the final RI Report.**

    The last paragraph of section 6.2.5.2 (continued onto page 6-35) appears to be discussing modeling results for the Water Table Zone. Ecology's view is that the data-trend information presented in Appendix H (for Shallow Zone wells CI-12-30 and CI-14-35) cannot be used to support the choice and use of a decaying source for the Water Table Zone. **The first (partial) sentence on page 6-35 is therefore only approved as part of the final RI Report with the following modification (truncation):**

    "concentrations in the Water Table…concentrations over time (Appendix H)."

Note: Appendix H presents modeling runs that applied input source concentrations which appear to be inconsistent with Table 15. Almost all of the input concentrations are less than the maximum – and some are even less than the average – source concentrations listed in Table 15. Please see Ecology's comments on Appendix H below.

74. Page 6-35, section 6.2.5.2. Point of clarification: Ecology believes the discussion on this page contains several speculative assertions that are poorly supported by Capital's site data and modeling results. In our opinion:

- it is premature to discuss the conservativeness of applying a decaying source before a decreasing trend can be positively identified throughout the cVOC plumes. Two shallow wells, CI-12-30 and CI-14-35, may indeed show a decreasing trend; but data from only 6 to 7 points have been collected during the RI. While we agree that testing a decaying source for the Shallow Zone in Source 1 modeling as part of a sensitivity analysis was appropriate, the decaying source discussion for the two wells should then have been presented in the sensitivity analysis section;

- recent data from CI-17, CI-18, and CI-19 do not, as the Report contends, indicate that COPCs originating from the Capital Property are not currently reaching the Waterway. Nor have we concluded that sources on the CalPortland Property have released HVOCs near the Waterway. In addition, it is not clear to us what modeling results the company was attempting to *confirm*; and,

- characterization of tidally-influenced dispersion and mixing has not been an RI task.[13] Ecology assumes, however, that tidal mixing or tidally-influenced dispersion is likely to be limited to a narrow zone along the bank of the Waterway. In our view none of the current monitoring wells (including CI-17, CI-18, and CI-19) are subject to tidal mixing or tidally-influenced dispersion.

The first full paragraph is therefore only approved as part of the final RI Report with the following modifications/truncation:

"When a decaying…average COPC source concentrations. Shallow Zone simulations…is overly conservative. A relatively low…in these simulations. Although the effects of tidal mixing cannot be incorporated into the BIOCHLOR model, *t*idally influenced dispersion and mixing have been recognized in groundwater…Kohout 1960). Dilution and dispersion associated…in many coastal areas. Therefore, tidal influences *may* decrease COPC *groundwater* concentrations *discharging to* the LDW."

[13] To be valuable, such an effort would likely need to be rigorous (both in terms of the characterization activity itself and Ecology review) and costly.

75. Page 6-36, section 6.2.5.2. Ecology generally agrees with Capital's sensitivity analysis approach and results. However, the sensitivity analysis should have also included the maximum concentrations base case. This should be included during future FS modeling.

    In addition, although Ecology agrees that source concentration, Aquifer K values, and cVOC degradation half-lives are the key and most sensitive modeling-input parameters, we disagree with the following statements in the last paragraph of 6.2:

    > "However, both source concentration and hydraulic conductivity are reasonably well-established by site-specific data. For solute half-life, relatively conservative baseline literature values were selected for the modeling. Overall, the sensitivity analysis results support the conclusion that current source concentrations will not results in COPCs above screening levels reaching the LDW within a reasonable range of Input parameters."

    PSC has noted (please see their enclosed comments), and Ecology agrees, that Capital's BIOCHLOR base case model did not apply representative hydraulic conductivity values for the Water Table and Shallow Zones. Various site characterizations show that aquifer K values within the Lower Duwamish valley can vary two to three orders of magnitude. Significant increases in aquifer K values are observed from the eastern edge to the central portion of the valley near the Waterway. For Capital's Source 1 area (550 feet from the Waterway) we should expect aquifer K values significantly higher than the value used as the base case input.

    Furthermore, neither Capital nor Ecology knows if the literature biodegradation rates are necessarily conservative for the Capital RI study area or the larger west-of-4th impacted area. Persistent TCE and vinyl chloride plumes have been observed in various areas, which may indicate that degradation is actually slower than model predictions suggest.

    If Capital's modeling utilized K and biodegradation values which (albeit unintentionally) do not – or cannot – conservatively represent site-specific conditions and complexity within the study area, some groundwater COPCs may discharge to the Waterway at concentrations above screening levels. **Since the last paragraph of section 6.2 does not, in our view, properly acknowledge this scenario, it is only approved as part of the final RI Report with the following modifications:**

    > "Results of the…Table 17. The most-sensitive…over baseline conditions. The sensitivity analysis…half-life are increased. However, source concentration *is* reasonably well-established by site-specific data. For solute half-life, relatively slow biodegradation rates were selected from the literature for the modeling. Overall, *Capital Industries believes* the sensitivity analysis results support *our* conclusion that current source concentrations will not result in COPCs above screening levels reaching the LDW."

76. Page 6-37, section 6.3. Point of clarification: As Ecology has noted above, the Report does not demonstrate that study area concentrations of 1,1-DCE are below applicable

screening levels. The first sentence on the page should therefore be re-visited during the FS after Capital has compared site data to 1,1-DCE SLs.

77. Pages 6-37 and 6-38, section 6.3.1. The Report identifies two potential receptor groups for inhalation of COCs: future construction workers and indoor receptors (via VI). Ecology agrees that the receptors of concern for this exposure route include indoor workers, future indoor residents, and belowground workers (trenchers). Outdoor aboveground workers and (future outdoor) residents should also have been identified as potential receptors (please see Comment #8 above). Current covering in those parts of the site area where shallow groundwater is contaminated minimizes outdoor inhalation risks, but it is not sufficient to limit the assessment to only these areas and the current, covered scenario. For the RI Capital should have focused on:

    - VOC (due to shallow groundwater and/or soil volatilization) inhalation for current aboveground outdoor workers
    - VOC (due to shallow groundwater and/or soil volatilization) inhalation for future aboveground outdoor workers and residents
    - VOC (due to shallow groundwater and/or soil volatilization) inhalation for current and future trenchers
    - VOC (via vapor intrusion and due to shallow groundwater and/or soil volatilization) inhalation for current indoor workers
    - VOC (via vapor intrusion and due to shallow groundwater and/or soil volatilization) inhalation for future indoor workers and residents
    - Dust (soil particulate) inhalation

    The 6.3.1 discussion of the vapor pathway at the bottom of page 6-37 is therefore only approved as part of the final RI Report with the following modifications:

    "The potential human…Area of Investigation are:
    - *E*xposure to vapors volatilizing…construction workers;
    - Vapor intrusion from…indoor ambient air*; and,*
    - *Inhalation of contaminants volatilizing from soils and/or shallow groundwater by aboveground workers and – potentially, in the future – residents, in areas where the ground surface is not effectively covered.*"

    In addition, on page 6-38 Capital notes that construction worker risk can be mitigated via "institutional and engineering controls." This is true. However, the Report should then have distinguished between those construction workers working on the Capital property from those working elsewhere. While Capital can fairly easily "control" the exposures to individuals working on its own property, the same cannot be said for off-property workers. In addition, the Report should have noted that a possible future scenario includes the absence of Capital Industries from the 5801 3rd Ave. property. While a restrictive covenant could be established for the property (not, presumably, for nearby properties), requiring controls on future subsurface work, why should we presume during

the RI that this is the most cost-effective and MTCA-compliant "action" to address the concern?

78. Page 6-38, section 6.3.1. As noted in General Comment #1, complete exposure pathways can be associated with either acceptable or unacceptable health risk. For vapor intrusion, the migration and exposure pathway are typically perceived as complete when there is a subsurface source, an occupied building, and a means for soil gas VOCs to enter that building. Consequently, Ecology disagrees that Tier 3 assessments have concluded that the VI pathway is "incomplete" at any of the investigated buildings. **The second and third sentences of the second paragraph are therefore only approved as part of the final RI Report with the following modifications:**

> "The results of the Tier 3 VI Assessments conducted *indicated* that VI *was not resulting in unacceptable impacts to indoor air quality* at five of the nine…Area of Investigation. Additional Tier 3 sampling…to *better* confirm the *absence of unacceptable* VI *impacts*."

In addition, Ecology agrees that pursuant to its VI program under the RI, Capital has evaluated current VI risk and responded, as needed, when it has appeared that current risks may be unacceptable. In this section of the Report, however, the pathway should also have been discussed within the "cleanup" context. Mitigation is typically viewed as an interim action, not a final cleanup action. Plus, the future unrestricted land use scenario that the MTCA soil and groundwater cleanup standards address anticipates the possibility of different building use, different buildings, and residential development. The Report should have noted this and then proceeded to describe the site areas and media, where – based on a comparison of site soil, soil gas, and/or shallow groundwater VOC data to SLs – vapor intrusion could be a concern in the unrestricted future. These areas/media must be identified in the FS.

79. Page 6-38, section 6.3.2. Receptors can be exposed to contaminated soils via several pathways and routes. For the RI Capital should have focused on:
    - Direct contact (ingestion and dermal contact), for current aboveground workers
    - Direct contact (ingestion and dermal contact), for future aboveground workers and residents
    - Direct contact (ingestion and dermal contact), for current and future belowground workers (trenchers)
    - Dust (soil particulate) inhalation for current aboveground outdoor workers
    - Dust (soil particulate) inhalation for future aboveground outdoor workers and residents
    - Dust (soil particulate) inhalation for current and future trenchers
    - VOC (due to soil volatilization) inhalation for current aboveground outdoor workers
    - VOC inhalation for future aboveground outdoor workers and residents
    - VOC inhalation for current and future trenchers

- VOC (due to soil volatilization into soil gas, and then vapor intrusion) inhalation for current indoor workers
- VOC (due to soil volatilization into soil gas, and then vapor intrusion) inhalation for future indoor workers and residents
- VOC (due to soil leaching to groundwater, followed by volatilization into soil gas and then vapor intrusion) inhalation for current indoor workers
- VOC (due to soil leaching to groundwater, followed by volatilization into soil gas and then vapor intrusion) inhalation for future indoor workers and residents
- Future Waterway receptors exposed to soil contamination that has leached to groundwater and then discharged to surface water

Section 6.3.2 appears to mention only the third through sixth bullets above, and then only for non-residential receptors.

The Report states that soil COC concentrations are below SLs protective of "direct contact or inhalation for construction workers during excavations." However, it is hard to see how Capital reached this conclusion. If site soil concentrations are below Method B or C direct contact cleanup levels, Ecology agrees that trenchers exposed to soil via direct contact are protected. But it does not appear that Capital has calculated any SLs protective of a trencher who inhales VOCs or dust; nor does it appear that the Report contains SLs protective of aboveground (outdoor) workers exposed to contaminated dusts or VOCs. Although Ecology agrees that current covering in the site area "minimizes the risk of direct contact" as well as exposures to inhalation risks, it is not sufficient to limit the assessment to only the current scenario.

The 6.3.2 discussion of the soil pathway on page 6-38 is therefore only approved as part of the final RI Report with the following modifications (addition of two bullets):

"The potential human…Area of Investigation are:

- Incidental ingestion and…construction workers during excavations;
- Inhalation of soil…generated during excavation;
- *Direct contact with COPCs in soil by future aboveground workers (should cover be removed); and*
- *Direct contact with COPCs in soil by future residents (should cover be removed and areas where soil is contaminated be developed for residential use).*

Concentrations of COPCs have not…protective of direct contact for construction workers during excavations. The limited area…the risk of direct contact."

80. Page 6-39, section 6.3.3. Receptors can be exposed to groundwater contaminants via several pathways and routes. For the RI Capital should have focused on:
    - Direct contact (ingestion and dermal contact), for current and future belowground workers (trenchers)

- VOC (due to shallow groundwater volatilization) inhalation for current aboveground outdoor workers
- VOC inhalation for future aboveground outdoor workers and residents
- VOC inhalation for current and future trenchers
- VOC (via vapor intrusion) inhalation for current indoor workers
- VOC inhalation for future indoor workers and residents
- Waterway receptors exposed to groundwater contamination that has discharged to surface water

Section 6.3.3 appears to mention only the first bullet above. **Therefore, the 6.3.3 discussion of the groundwater pathway is only approved as part of the final RI Report with the following modifications:**

"The potential human…Area of Investigation are:

- Incidental ingestion and… during excavations that extend into groundwater;
- Ingestion of groundwater as a drinking water source; *and*
- *Those surface water pathways described below for groundwater contamination that discharges to surface water.*

"The ground surface *in many areas overlying groundwater contamination* is capped with…structures. *In these areas,* therefore, excavation activities would…to human health. *So p*otential exposure pathways include…during excavations. Future development activities…contaminated groundwater to *belowground* workers *and, potentially, residents.*

"No groundwater supply…Are of Investigation. In addition,…city limits. As discussed in Section 2.3.5, Groundwater Use, *Capital Industries believes* groundwater *in the RI study area* is a non-potable resource, cannot be used…Area of Investigation."

81. Page 6-40, section 6.3.4. The second-to-last paragraph of 6.3.4 states that sampling and modeling results "confirm" that COPC concentrations greater than SLs do not and will not discharge to the Waterway. As Ecology has noted in other comments, we disagree that this is the case. We also disagree that surface water-related exposure pathways are incomplete.

The last 6.3.4 paragraph asserts that screening-level modeling results "confirm" that elevated levels of vinyl chloride may reach the Waterway in 15 years. It goes on to argue that the company's modeling was "extremely conservative" and the "potential for contaminated groundwater to reach the LDW is low." Ecology disagrees. We do not believe that Capital's modeling *confirms* anything about the future fate and transport of groundwater contamination. And, while certain modeling inputs were conservatively chosen, we also believe it is incorrect to characterize the modeling results as "extremely conservative." Certain COPCs in the RI study area may not reach the Waterway at detectable levels, but Ecology believes others will (and probably already have).

The last two paragraphs of 6.3.4 are therefore only approved as part of the final RI Report with the following modifications:

"*Capital Industries believes t*he results from the RI…to the LDW. Therefore, *Capital Industries concludes* there is no complete exposure pathway for surface water.

"BIOCHLOR *modeling results indicate* that concentrations of…in 15 years. Although there may be…in the future, *Capital Industries believes* the model parameters are…LDW is low. Sensitivity analysis results…levels reaching the LDW, *based on a* range of input parameters *Capital Industries believes is* reasonable."

82. Page 6-40, section 6.4.1. As noted in Comment #56 above, 1,4-dioxane should not be considered a "secondary" COPC. In addition, as we have discussed in other comments, Ecology does not agree that Capital has shown that CalPortland and "a former tenant at the tenant at the Pacific Food Systems North Building" are sources of COPCs. **The last sentence of 6.4.1 is therefore only approved as part of the final RI Report with the following modification:**

    "The sources of the COPCs include the Capital Property, and the BDC, PSC, and ABP facilities."

83. Page 6-41, section 6.4.1.1. Ecology disagrees with the last sentence of the sub-section: "…COPCs have not reached and will not reach the LDW from sources within the Capital Area of Investigation." In our opinion the Report has not demonstrated this conclusion. There is a significant difference between concluding that COPCs do not, and will not, reach the Waterway, and concluding that COPCs do not, and will not, reach the Waterway *above surface water-based SLs*. The Report, at least here, concludes the former, and there is little support provided for confidently concluding that no groundwater COPC will ever reach the Waterway/Slip 2. **The sentence is therefore excluded from the final, approved RI Report.**

84. Pages 6-41 and 6-42, sections 6.4.1.2 and 6.4.1.3. Point of clarification: In the discussions regarding vinyl chloride in the shallow and intermediate zones the Report states that a source is the PSC-Georgetown facility. Ecology agrees that vinyl chloride is elevated in shallow and intermediate zone groundwater approaching 4th Ave. S. This suggests that releases from the PSC-Georgetown facility are contributing to west-of-4th vinyl chloride detections. However, Ecology views this source as only one of the contributors to the significantly higher levels of vinyl chloride observed in Capital's more westerly study area.

85. Page 6-42, section 6.4.1.3. Point of clarification: The last paragraph before section 6.4.2 states that COPC concentrations decrease with depth in Capital's RI study area. Ecology assumed the statement was meant to refer to groundwater generally, and not exclusively the intermediate zone. For all groundwater zones, this statement may often be true, but vinyl chloride is a COPC and it clearly does not demonstrate such behavior at a number

of locations. The Report should have qualified the statement in the first sentence so that it was clear which specific COPCs the authors were referring to.

86. Page 6-42, section 6.4.2. The second, third, and fourth sentences of 6.4.2 are not, in Ecology's opinion, well-supported by data in the RI Report. Please see several of our related comments above. **These three sentences are excluded from the final, approved RI Report.**

87. Page 6-43, section 6.4.2. The second sentence of the first paragraph on this page states that TCE and vinyl chloride in the water table and shallow zones is migrating into Capital's study area from Blaser, Art Brass, and PSC. This may be true, but in Ecology's opinion, "the data" do not necessarily indicate this. TCE levels at wells 7-40 and 8-40 have been below detection limits. It is not obvious to Ecology, then, why Capital believes PSC is contributing TCE to the shallow zone in the company's study area. TCE levels along Mead, west of 2nd Ave., have been low in both the water table and shallow zones. So again, it is not obvious to Ecology, why Capital believes Art Brass is contributing TCE to the water table and shallow zones in its RI study area. **The sentence is therefore excluded from the final, approved RI Report.**

88. Page 6-43, section 6.4.2. The third sentence of the first paragraph states that a source for groundwater contamination "has been identified" on the CalPortland property. Capital's suspicion about the cause for cVOC detections at well 17WT and 17-30 cannot be stated this strongly in a Report Ecology is being asked to approve. Please see Comment #55 above. In addition, we also disagree that the Report has demonstrated that a non-Capital release has led to soil contamination below the Pacific Food Systems North Building. This is certainly possible, but in our view the Report has not shown it to be "likely." **The third and last sentences are therefore excluded from the final, approved RI Report.**

89. Page 6-43, section 6.4.3.1. Point of clarification: The second paragraph of this sub-section seems to forget that in other parts of the Report Capital has stated that much of the vinyl chloride detected in study area wells has come from an upgradient non-Capital source. While Ecology agrees that reductive dechlorination is very likely occurring, and that natural attenuation is limiting PCE and TCE transport, we believe the best evidence for the latter is the low or non-detect levels of the two chemicals found in samples collected downgradient.

90. Pages 6-43 and 6-44, section 6.4.3.1. Ecology disagrees with the first sentence of 6.4.3.1's third paragraph. Monitoring and modeling results do not, in our view, "confirm" that PCE, TCE, and cis-1,2-DCE will not reach the Waterway/Slip 2 in any water-bearing zone. Please see our related comments above. **The third and fourth paragraphs of 6.4.3.1 are therefore only approved as part of the final RI Report with the following modifications:**

> "Modeling results suggest that vinyl chloride…over time. Peak concentrations at…of 1.28 µg/l. Similarly, simulated…of 1.69 µg/l. However, *Capital Industries believes* these simulations were run under very conservative

assumptions, including…of the source. The simulations also… for tidal mixing. As noted in Section 6.2.5,… decaying source term, which *Capital Industries believes* is more realistic…at the LDW.

"Concentrations of the COPC 1,4-dioxane have…Capital property. These results…to groundwater. Concentrations of iron…Capital Area of Investigation. *Capital Industries believes these metals were not released at the Property, but are present due to groundwater geochemical conditions in the Area of Investigation.*"

RI SUMMARY AND CONCLUSIONS (7)

91. Pages 7-1 and 7-2, section 7.1.1. 1,1-DCE should have also been listed as a COPC on page 1. Please see Comment #13 above.

    Ecology agrees with the list of six contaminants provided at the top of page 2 if:
    a) cis-1,2-DCE and trans-1,2-DCE have not been detected in soils, groundwater, or soil gas at levels exceeding SLs, and
    b) 1,1-DCE has not been detected in soils, groundwater, or soil gas at levels exceeding SLs.

    This should be verified during the FS.

92. Page 7-2, section 7.1.1. Ecology is not confident that solvents used at Capital in the past never included 1,4-dioxane. We do agree, however, that with the possible exception of the 2010 water table detections of 1,4-dioxane at 137WT, MW7, and 11WT, groundwater dioxane contamination in Capital's study area appears to be primarily due to contamination migrating into the area from east of 4th Ave. S. **The second sentence of the second-to-last paragraph of 7.1.1 is included in the final, approved RI Report, but only by modification to:**

    "*Capital Industries believes that* operation at the Capital Property…source of 1,4-dioxane."

93. Page 7-2, section 7.1.2. The first paragraph of the section identifies some sources of releases that are, at this time, essentially speculative. Please see our related comments above. **The second sentence of the paragraph is therefore only approved as part of the final RI Report with the following truncation:**

    "Other sources include releases from the BDC, ABP, and PSC facilities."

94. Page 7-3, section 7.1.3. This section of the Report repeats previous Capital assertions about COPCs that have and have not been detected at elevated levels in soils, and the adequacy of site soil characterization. As noted in comments above, Ecology believes the Report omits several soil sampling locations when identifying locations where COPC SLs have been exceeded. We have also been clear in our comments on the draft RI Report, as well as in follow-up discussions regarding those comments, that we do not feel soil contamination in the study area is well-characterized. This is especially true for soils

currently located within the Plant 2 building footprint. We agree with Capital that later, when cleanup options are considered, soil data gaps can be revisited to determine which should be filled and when. But this is different than crediting the RI with *sufficiently delineating* the nature and extent of soil contamination, irrespective of the cleanup action ultimately chosen.

In addition, Ecology does not concur that the Report has demonstrated that the Pacific Food System North Building is a "source area" – if by this the Report means a subsurface source of PCE and TCE not due to Capital releases.

Therefore, the only portion of section 7.1.3 included in the final, approved RI Report is a modification of the last sentence:

> "*The characterization of the* nature and extent of VOCs in soil at the Capital Area of Investigation, with the exception *of soils beneath* the Pacific Food System North Building, *is adequate for beginning an evaluation of* technically feasible cleanup alternatives."

95. Pages 7-3 and 7-4, section 7.1.4. In the discussion of the water table zone the Report states that PCE, TCE, and vinyl chloride do not reach the Waterway based on sampling results from wells 18WT and 16WT. Ecology agrees that the compounds were not detected in groundwater samples collected from these wells in May/June 2012. However, neither well is located as close to the Waterway as wells 19WT and 17WT, and neither has been sampled more than twice or during months outside of May and June. All three compounds have been detected in samples from 17WT.

    Capital goes on here to assert that a "source of PCE, TCE, and vinyl chloride" is present at the CalPortland facility. As noted in comments above, the Report has not demonstrated that such a source exists; at this time it is merely a Capital suspicion, based on well 17 detections (of primarily PCE) that were not expected.

    The fourth and fifth sentences of 7.1.4's "Water Table Zone" paragraph are therefore only approved as part of the final RI Report with the following modifications:

    > "Monitoring well data from sentinel wells CI-18-WT and CI-16-WT suggest that PCE, TCE, and vinyl chloride in the Water Table Zone *may not be currently reaching* the LDW *downgradient of these wells. Capital believes* there is a source of…cluster location CI-17."

96. Page 7-4, section 7.1.4. In the second paragraph of the discussion of shallow zone contamination the Report states that vinyl chloride levels increase in the vicinity of well "17-40." This well location is described as "west and down-gradient of a source area identified up-gradient and north of Capital Plant 5, and northeast of monitoring well CG-141-40."

Ecology assumed (the Report does not say) that the "source area" referred to here is groundwater contamination in the vicinity of DP point B28, and Capital used the term "source area" to simply connote an area with higher vinyl chloride concentrations. However, there is no well "17-40." If the Report meant well 17-30 and was indeed referring to an area near B28, Figure 24 does not suggest that well 17-30 is downgradient of B28. It is also possible that Capital was referring to well 15-40, not 17-30. In any case, this sentence should be clarified during the FS. **The second sentence of the second "Shallow Zone" paragraph is not included in the approved, final RI Report.**

97. Page 7-5, section 7.1.4. In the first paragraph of the discussion of intermediate zone contamination the Report states that vinyl chloride levels increase in the vicinity of well "17-60." This appears to be a typographical error similar to the one noted in the comment above, and perhaps Capital was referring to well 15-60. This sentence should be clarified during the FS. **The third sentence of the paragraph is not included in the approved, final RI Report.**

98. Pages 7-5 and 7-6, section 7.1.5. The second sentence of this section, claiming that PCE and TCE will be completely reduced to CO_2 in the WT-zone, is – in Ecology's opinion – an overstatement of what Capital's RI geochemical data indicate. Please see our related comments above. **The sentence is not included in the approved, final RI Report.**

Ecology agrees that the geochemistry of deeper groundwater is more likely to effectively reduce chlorinated ethenes, but the Report has not made a convincing case that these conditions will lead to the effective degradation of the less highly substituted ethenes such as vinyl chloride (ultimately produced by the degradation of PCE and TCE). **The first sentences of the first two full paragraphs on page 6 are therefore only approved as part of the final RI Report with the following modifications:**

> "*Measurements of* geochemical conditions…indicate that groundwater conditions *may be* amenable to the complete …and/or TCE."

In addition, as noted in comments above, ethene was not detected in Capital's study area, according to Table 13. It is unclear, then, why the first sentence of the last 7.1.5 paragraph states that ethene is "present."

99. Pages 7-7, section 7.1.6. Ecology generally agrees that head differences between the aquifer zones are relatively small in Capital's RI study area. However, as noted above, we disagree that the vertical hydraulic gradient is not a factor in vertical transport of contaminants. A downward hydraulic gradient may exist in unpaved areas due to infiltration, while an upward gradient likely occurs near the Waterway, resulting from the saltwater wedge. These gradients play an important role in contaminant transport. **The third paragraph on page 7-7 is therefore not included in the approved RI Report.**

Furthermore, the RI Report would have been improved by a thoughtful discussion of the possibility of enhanced groundwater transport via preferential pathways within the study area. Such pathways could confound our expectations regarding: a) what is

"downgradient" (i.e., could result in higher than anticipated COC levels in areas that would not be expected to be in the primary path of contaminated groundwater flow), and b) COC levels in locations approaching the Waterway (i.e., could result in higher than anticipated COC levels in downgradient locations where we would have expected more attenuation in concentrations). Though the Report repeats a number of times Capital's belief that its modeling is overly-conservative, there is little acknowledgement of the transport uncertainty associated with unknown preferential pathways. During the FS Capital should improve upon its understanding of possible saturated zone preferential pathways, and how these pathways may be affecting COC transport.

100. Pages 7-9 through 7-14, section 7.1.7. As noted in Comment #36 above, Ecology understands that the Report's discussion of vapor intrusion assessments conducted during the RI has chosen to refer to contemporary action levels. Some of these levels have changed since the time of the assessments; for PCE and TCE the levels have increased.

    Also, as noted above, Ecology does not agree that the Tier 3 assessments at Plant 1, Plant 2, and Mobile Crane concluded the VI pathways at those locations were "incomplete." Concluding that the risk is acceptably low does not necessarily mean the pathway is incomplete. **The three sentences on pages 7-9 and 7-10, referring to an incomplete VI pathway at the shipping office, QC/laser office, and Mobile Crane (respectively), are therefore not included as part of the final approved RI Report.**

101. Page 7-13, section 7.1.7. The second paragraph under "Gull Industries Building…" states that the "NCCEF values were 0 for all three samples." As noted in comments above, PCE and TCE were detected and are also non-carcinogens; therefore, the NCCEF cannot be zero. **The third sentence of this paragraph is not part of the final approved RI Report.**

102. Page 7-14, section 7.1.7. Point of clarification: Since PCE and TCE were detected in the indoor air at the Gull building, the Report should not have said the Tier 3 concluded that contaminated soil gas is "not migrating to the interior of the building..." Please see Comment #40 above.

103. Page 7-14, section 7.1.8. As noted in comments above, Ecology does not agree that the RI modeling indicates that PCE, TCE, and cis-1,2-DCE in groundwater are "unlikely to reach the LDW…" **The first sentence of 7.1.8 is therefore not part of the final approved RI Report.**

104. Page 7-16, section 7.1.9. The "Soil Pathways" discussion here appears to be identical to what was presented on page 6-38. Consistent with Comment #79, **the 7.1.9 discussion of the soil pathway is only approved as part of the final RI Report with the following modifications:**

    "The potential human…Area of Investigation are:

    - Incidental ingestion and…construction workers during excavations;

- Inhalation of soil…generated during excavation;
- *Direct contact with COPCs in soil by future aboveground workers (should cover be removed); and*
- *Direct contact with COPCs in soil by future residents (should cover be removed and areas where soil is contaminated be developed for residential use).*

Concentrations of COPCs have not…protective of direct contact for construction workers during excavations. The limited area…the risk of direct contact."

105. Page 7-16, section 7.1.9. The "Groundwater Pathways" discussion here is similar to what was presented on page 6-39, but more abbreviated. Consistent with Comment #80, **the 7.1.9 discussion of the groundwater pathway is only approved as part of the final RI Report with the following modifications:**

"The potential human…Area of Investigation are:

- Incidental ingestion and… during excavations that extend into groundwater;
- Ingestion of groundwater as a drinking water source; *and*
- *Those surface water pathways described below for groundwater contamination that discharges to surface water.*

"The ground surface *in many areas overlying groundwater contamination* is capped with…structures. *In these areas,* therefore, excavation activities would…to human health. *Capital Industries believes* groundwater *in the RI study area* is a non-potable resource and cannot be used… Investigation or adjacent properties. *The groundwater* pathway for…currently incomplete."

106. Page 7-17, section 7.1.9. The "Vapor Pathway" discussion here is almost identical to what was presented on pages 6-37 and -38. Consistent with Comment #77, **the 7.1.9 discussion of the vapor pathway is only approved as part of the final RI Report with the following modifications:**

"The potential human…Area of Investigation are:

- *E*xposure to vapors volatilizing…construction workers;
- Vapor intrusion from…indoor ambient air*; and,*
- *Inhalation of contaminants volatilizing from soils and/or shallow groundwater by aboveground workers and – potentially, in the future – residents, in areas where the ground surface is not effectively covered.*

"The exposure risk…and engineering controls. These controls may include a restrictive covenant *on the respective property* that may…during excavation.

"The exposure risk…(Farallon 2011a). The results from the Tier 3 VI Assessments conducted *indicated* that VI *was not resulting in unacceptable impacts to indoor air quality* at five of the nine…Area of Investigation. Additional Tier 3 sampling…to *better* confirm the *absence of unacceptable* VI *impacts*. Tier 4 VI…results. Tier 4 VI…prior to the RI."

107. Pages 7-17 and 7-18, section 7.1.9. The "Surface Water Pathway" discussion here is almost identical to what was presented on pages 6-39 and -40, section 6.3.4. The first paragraph after the bullets states that modeling results "confirm" that COPC concentrations greater than SLs do not and will not discharge to the Waterway. The Report then states there are no complete exposure pathways for surface water. **This paragraph is only approved as part of the final RI Report with the following modification:**

> "*Capital Industries believes t*he results from the RI…to the LDW. Therefore, *Capital Industries concludes* there is no complete exposure pathway for surface water."

Also, consistent with Comment #81, **the last 7.1.9 paragraph is only approved as part of the final RI Report with the following modification:**

> "BIOCHLOR *modeling results indicate* that concentrations of…in 15 years. Although there may be…in the future, *Capital Industries believes* the model parameters are…LDW is low. Sensitivity analysis results…levels reaching the LDW, *based on a* range of input parameters *Capital Industries believes is* reasonable."

108. Page 7-18, section 7.2. Other than the last sentence on the page, Ecology generally concurs with the concluding remarks of section 7.2. For clarification purposes, however, we note that while the "vertical and horizontal extent of COPCs in groundwater" has been investigated, and is well-characterized in certain areas, Ecology would not say "fully delineated" applies to the entire study area. And while we agree that groundwater (and soils) has been "sufficiently characterized" <u>for the RI's purposes</u>, in our mind these purposes are, and have been, limited.

The last sentence is premature. Sufficient information is now available to begin an FS; but Ecology does not know whether additional information will be needed to complete an FS and select a cleanup action. That will depend to a large degree on the alternatives chosen to be evaluated. **The last sentence is therefore only approved as part of the final RI Report with the following modifications:**

> "There is sufficient information to *begin an evaluation of* technically feasible cleanup alternatives."

<u>TABLES</u>

<u>Tables 1, 2, and 3</u>

109. Tables 1, 2, and 3 propose screening levels (SLs) for soils, groundwater, and air. Ecology agrees with many of these concentrations. Below, however, we have noted different SL values for certain COCs/media/pathways that should be applied during the FS. **Because a number of Capital's proposed SLs are, in Ecology's opinion, incorrect, and should not be used during the forthcoming FS, these three tables are**

not approved as part of the final RI Report. Before initiating future FS tasks Capital should revise the three tables to address comments below and then re-submit them for review. Revised tables should be accompanied by a discussion of the methodology used when calculating the levels; for those SLs not based on ARARs, the equations and equation inputs should be identified.

NOTE: Method B cleanup standards must be set low enough so that – by the completion of cleanup – the total human health risk/hazard for all site COCs does not exceed a risk of 1E-5 or an HI of 1.0. This is generally applied to a particular exposure pathway and receptor group. The SL concentration values Ecology identifies below do **not** take total risk/hazard into account. That is, these concentrations are only – necessarily – protective if there is a single COC. In the FS, particular COC preliminary cleanup levels may need to be adjusted downwards to ensure a total risk less than or equal to 1E-5, and total HI less than or equal to 1.0, at cleanup completion.

Table 1

110. As discussed in Comment #36 above, VOCs in soils can potentially threaten indoor air quality via two migration routes. It appears that Table 1 only establishes soil SLs for one of these routes, soil-to-groundwater-to-soil gas-to-indoor air. The resulting SLs may therefore not be conservative (adequately protective).

111. Ecology believes the trans-1,2-dichloroethene (DCE) groundwater-protection soil SL should be ~3.8 mg/kg. Ecology's recommended concentration assumes the SL is: a) intended to protect shallow groundwater that may serve as a VI source, and b) based on an HQ of 1.0.[14]

When Table 1 is revised during the FS, Capital should identify the groundwater SL that the "groundwater protection" soil SL is meant to protect. This applies to all COPCs, not just trans-1,2-DCE.

112. It is unclear why 1,1-DCE SLs were not identified in Table 1.

Table 2

113. Some of the titles in the first column of Table 2 are incorrect. The first four rows, for example, are all the same. Ecology assumed the second through fourth groundwater SLs (1st column) were intended to be:

- Groundwater, Method B, non-carcinogenic, residential, groundwater to indoor air
- Groundwater, carcinogenic, commercial, groundwater to indoor air
- Groundwater, non-carcinogenic, commercial, groundwater to indoor air

[14] NOTE: if Capital used a target HQ of 0.1 in calculating this SL, the proposed concentration (0.35 ug/l) is similar to Ecology's recommendation.

In addition, the "Surface Water ARAR" value is qualified as the "Aquatic Life" concentration. The values entered in the table, however, are protective of human health.

114. Table 2 lists groundwater and SW SLs. For the groundwater-to-indoor air (VI) pathway, Capital may choose to derive and utilize non-carcinogenic SLs that are based on an HQ of 0.1. However, Method B does not *require* that CULs be necessarily set to such stringent levels. Individual COC SLs can initially be set to concentrations associated with an HQ of 1 (and then adjusted downwards, if necessary, to ensure a Hazard Index no greater than 1). When Table 2 is revised, footnotes should clarify the target HQ per non-carcinogenic SL.

    In addition, RI *commercial* "Groundwater to Indoor Air Screening Levels" can certainly be identified and/or referenced in the Report – as Capital has done here. These concentrations are primarily used during the RI to determine if: a) subsurface contamination appears to pose a VI threat significant enough to investigate further (by sampling indoor air, for example), and/or b) a particular site building needs to be mitigated. "Commercial" IPIMALs are concentrations established to protect indoor workers, but they are not MTCA cleanup levels. No *commercial* air – or groundwater – cleanup levels are defined in WAC 173-340. MTCA air cleanup levels can only be distinguished between those concentrations that are applicable to unrestricted land use, and those that apply to industrial land use scenarios. These are the levels Capital should use in the FS.

115. Tetrachloroethene (PCE): The standard Method B SW CULs using Equations 730-1 (non-carcinogenic) and 730-2 (carcinogenic) are ~500 and ~100 µg/l, respectively. The corresponding PCE "API Fisher" SW CULs should then be about 214 (non-carc) and 42 (carc) µg/l. It is unclear how Capital derived a 535 µg/l non-carcinogenic SL for PCE.

    Capital's PCE groundwater SLs protective of residential and non-residential ("commercial") air quality (referred to as "IPIMALs") appear approximately correct, except for the "commercial" non-carcinogenic SL. Ecology believes the four PCE values should be approximately:

    a) 115 µg/l (unrestricted, carcinogenic);
    b) 220 µg/l (unrestricted, non-carcinogenic, based on an HQ of 1);
    c) 270 µg/l ("commercial," carcinogenic); and,
    d) 90 µg/l ("commercial," non-carcinogenic, based on an HQ of 0.1).

    It is unclear how Capital derived the table's commercial non-carcinogenic value of 50 µg/l.

    As noted in Comment #114 above, groundwater SLs protective of a *commercial* building's indoor air quality are not MTCA CULs.[15]

[15] Groundwater cleanup levels protective of an industrial building's indoor air quality can be established via Method C. However, Method C groundwater CULs must be justified and established via requirements set out in WAC 173-340-706 and -720, which include the imposition of land/resource use controls. These concentrations will differ from

116. Trichloroethene (TCE): Ecology believes the standard (equation-based) Method B SW CULs for TCE should be: ~13 µg/l (as a carcinogen) and ~120 µg/l (as a non-carcinogen). These concentrations correspond to "API Fisher" SW CULs of approximately 5 (carc) and 50 (non-carc) µg/l. It is unclear how Capital derived a 130 µg/l non-carcinogenic SW TCE SL. The Method B groundwater CUL protective of SW quality should be 30 µg/l.[16] This concentration is the human health SW ARAR value issued pursuant to the Clean Water Act (CWA).[17]

    "Commercial" VI-protective groundwater SLs should be approximately 27 µg/l for TCE as a carcinogen and 7 µg/l for TCE as a non-carcinogen. Ecology is unclear how Capital derived the table's proposed values (16 and 4 µg/l). Groundwater TCE SLs protective of a *commercial* building's indoor air quality are not MTCA CULs, though they may be used for assessment purposes.

117. Cis-1,2-DCE: Presently there are no cis-1,2-DCE Method B or C human health SW CULs in the CLARC database. It is unclear, then, how Capital derived the "API Fisher" non-carcinogenic SW CUL in the table (i.e., Ecology does not know what toxicity information the company used to calculate the 3,000 µg/l value).

118. Trans-1,2-DCE: The table correctly identifies the trans-1,2-DCE CWA SW ARAR as 10,000 µg/l. The standard Method B SW CUL, however, based on use of the 173-340-730 Equations, is 33,000 µg/l. The API Fisher SL should therefore be approximately 14,000 µg/l (HQ of 1), not 3,500 µg/l. It is unclear how Capital derived the 3500 µg/l value.

    The trans-1,2-DCE groundwater SLs based on the protection of indoor air quality appear to be correct if linked to an HQ of 0.1. As with other VOCs listed in the table, trans-1,2-DCE groundwater SLs protective of *commercial* air quality are not MTCA CULs.

119. Vinyl chloride: Table 2 identifies the vinyl chloride Method B SW CUL values as 1.7 and 710 µg/l, for vinyl chloride acting as a carcinogen and non-carcinogen, respectively (based on protection of API receptors). Ecology believes the standard (equation-based) Method B SW CULs for vinyl chloride should be: 3.7 µg/l (as a carcinogen) and 6,600 µg/l (as a non-carcinogen). The corresponding vinyl chloride "API Fisher" SW CULs

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west-of-4th "commercial IPIMALs" since Method C CULs are set to a risk of 1E-5 or an HQ of 1 (whichever results in a lower concentration).

[16] The table lists an ecological SW SL of 47 µg/l. This may be the most conservative ecological concentration for receptors at the Waterway. However, EPA Region 3 has recommended a lower value (21 µg/l), based on Canadian Environmental Quality Guidelines for freshwater. Before developing and evaluating cleanup alternatives in the FS, the west-of-4th parties should determine if the Region 3 concentration is a more appropriate TCE surface water screening level than 30 µg/l (the CWA ARAR).

[17] NOTE: the CWA ARAR is not protective of human health at the Duwamish Waterway to the 1E-6 risk level. However, it is protective of "API" human health to the 1E-5 threshold risk level if receptors are only exposed to TCE. The TCE ARAR concentration may not be adequately protective if receptors are exposed to COCs in addition to TCE.

would then be about 1.5 (carc) and 2834 (non-carc) µg/l. It is unclear how Capital derived the table's proposed non-carcinogenic SL value.

The ecological vinyl chloride SW SL presented in the table is 12,000 µg/l. However, the 2009 SQRT tables and the 2003 EPA Region ecological screening level tables recommend a value of 930 µg/l. Before developing and evaluating cleanup alternatives in the FS, the west-of-4th parties should determine the most appropriate ecologically-based surface water screening level for vinyl chloride.

The vinyl chloride Method B SW CUL value, based on the ARAR, is correctly noted in the table as 2.4 µg/l. However, it is not then identified as the "most stringent" shallow and intermediate zone SL. While it is true that 1.69 is the lower of the two numbers, the ARAR concentration is adequately protective (risk < 1E-5) and should be considered the preliminary Method B SW CUL.

As noted for other VOCs, vinyl chloride groundwater SLs protective of *commercial* air quality are not MTCA CULs.

120. 1,4-dioxane: It is unclear to Ecology how Capital derived the SW CUL of 20,700 µg/l (non-carcinogenic, API-fisher protection). Currently there are no Method B human health SW CULs for dioxane identified in CLARC. Perhaps the value was obtained from previous PSC documents.

121. 1,1-DCE: no groundwater SLs were presented for this compound in Table 2. Ecology is unsure why. The SW ARAR value of 3.2 µg/l appears to be the most stringent SL concentration.

122. Groundwater SLs intended to protect surface water quality are essentially the same as MTCA Method B SW CULs (for the protection of human health and ecological receptors). SW CULs derived by Equations 730-1 and 730-2 assume that human receptors will consume site-contaminated fish at a specified rate. In the RI Report Capital has assumed this rate to be 57 g/day (with a FDF of 1), selected to correspond to an expected "API" Duwamish Waterway consumption rate. However, during the FS it is possible that Ecology will request that preliminary site SW CULs be based on a different rate (and/or "fish diet fraction"). This is due to two developments that may eventually impact cleanup levels for the west-of-4th site:

    (1) establishment of protective SW CULs for the Lower Duwamish Waterway Superfund site, which consider Tribal consumption of locally harvested fish and shellfish, and could therefore be based on assumptions about fish consumption more conservative than the 57 g/day "API" consumption rate,[18] and

[18] Ecology's LDW Toxics Cleanup Program group provided preliminary information on this issue prior to Ecology's completion of today's letter. According to this information, Waterway surface water SLs/CULs are likely to be based on the following Equation 730 input values (for the protection of adult tribal fish consumers):

(2) changes to the default Fish Consumption Rate and/or Fish Diet Fraction values presently in the WAC 173-340-730 regulations. As Ecology has announced in its August 27, 2012, "Fish Consumption Rates" technical support document, the default Fish Consumption Rate values presently in our regulations do not adequately protect certain fish-consuming receptors. Ecology therefore expects to make revisions to WAC 173-340-730 to better ensure that these higher-consuming receptors are adequately protected by the concentrations chosen for site SW CULs.

Table 3

123. 1,1-DCE: The IPIMALs listed here are correct, if intentionally set to an HQ of 0.1. Please see Comment # 114 above.

As noted in comments on Table 2's groundwater SLs, indoor air SLs (IPIMALs) protective of a *commercial* building's indoor air quality are not MTCA CULs.

124. Cis-1,2-DCE: At the present time there are no Method B or C air CULs for this compound. SLs need not be identified for inhalation pathways.

125. It is unclear why trans-1,2-DCE was not one of the COPCs with SLs in Table 3.

126. PCE: The non-carcinogenic residential IPIMALs listed here are correct, if intentionally set to an HQ of 0.1. The Method B air CUL should be 9.6 µg/m3 for PCE acting as a carcinogen. The associated GW IPIMAL would then be approximately 115 µg/l.

The "commercial" indoor air IPIMALs should be approximately 22 and 8 ug/m3 for PCE as a carcinogen and non-carcinogen, respectively. Associated groundwater IPIMALs would then be approximately 270 and 90 µg/l. As noted above, indoor air SLs protective of a commercial building's indoor air quality are not MTCA CULs.

127. TCE: The residential SL concentrations in the table appear to be correct if Capital intends the SLs to correspond to an HQ of 0.1. However, the "commercial" TCE IPIMAL concentrations should be about 1.5 µg/m3 for TCE as a carcinogen and 0.39 µg/m3 for TCE as a non-carcinogen (if Capital chooses to set the non-carcinogenic "commercial SL" to an HQ of 0.1). Corresponding groundwater IPIMALs would then be approximately 27 µg/l for TCE as a carcinogen and 7 µg/l for TCE as a non-carcinogen.

- ABW = 81.8 kg
- AT = 64 years (for non-carcinogenic effects) and 70 years (for carcinogens)
- FCR = 97 g/d
- FDF = 1.0
- ED = 64 years

As noted above, *commercial* indoor air SLs are not MTCA CULs.

128. Vinyl chloride: The IPIMALs listed here are correct, if intentionally set to an HQ of 0.1. As noted above, *commercial* indoor air SLs are not MTCA CULs.

Table 5

129. The notes to Table 5 state that bolded concentrations are those above Table 1 SLs. However,
    - Table 1 does not include soil SLs for 1,1,1-TCA, 1,2-DCA, 1,1-DCA, or 1,1-DCE. It is unclear, then, which SLs Capital used for these compounds;[19] and,
    - as Ecology has noted above, we believe the trans-1,2-DCE SL in Table 1 is about an order of magnitude too high.[20]

    During the FS Capital should determine if the Reporting Limits for 1,1,1-TCA, 1,2-DCA, 1,1-DCA, and 1,1-DCE were below the most conservative soil SLs.

Table 6

130. SLs are identified at the bottom of each page of Table 6. Footnote 4, attached to all SL values presented on pages 1 and 2, refers to CLARC and says that these values are standard Method B soil cleanups protective of groundwater. The table's notes also state that bolded concentration measurements are those above Table 1 SLs. However,
    - the table's title for the SLs on pages 1 and 2 says "MTCA Method C", not B, SLs; and,
    - while the SLs on pages 1 and 2 are the same as those identified in Table 1, page 3's SLs are different (i.e., different than those on the first two pages and those identified in Table 1). Ecology cannot determine what the SLs on page 3 are based on.

    Table 6 is therefore not included as part of the approved final RI Report. During the FS Capital should revise and re-submit the table.

Table 8

131. Table 8 presents historical (pre-2006, ECS) direct push groundwater data. Bolded concentration values are those which exceed Table 2 SLs. However,
    - no 1,1-DCE data are presented. If 1,1-DCE was not an analyte for this pre-2006 work, it was rightly omitted. But if it *was* an analyte it should have been included; and
    - the table includes footnotes 3 and 4. It is unclear what parts, if any, of the table these notes correspond to.

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[19] None of these substances was detected. However, without identified SLs we cannot determine if reporting limits were low enough to provide information about the usability of the ND measurements.

[20] This will make no difference to the bolding in Table 5, however, since no concentrations exceeded reporting limits.

Tables 9 and 10

132. Tables 9 and 10 include multiple pages of DP and monitoring well groundwater data. Ecology's review focused on data collected within Capital's RI study area. The tables:
    a) do not include 1,1-DCE data. It is unclear why this COC was omitted;
    b) include a SL row at the bottom of each page that is titled "MTCA Method C Modified Screening Levels." Ecology is unsure why. The SLs provided appear to be those from Table 2; these are not Method C CUL values, modified or standard; and,
    c) provide shallow and intermediate zone SL values for trans-1,2-DCE and vinyl chloride that are lower than those Ecology believes should be used (please see our comments on Table 2 above). This will affect the "bolding" for vinyl chloride.

    Tables 9 and 10 are therefore not included as part of the approved final RI Report. During the FS Capital should: a) provide the corresponding 1,1-DCE DP and monitoring well groundwater data, and b) determine which vinyl chloride data points exceed approved SLs. This need only be done for those data generated during investigation of Capital's study area.

Table 12

133. Table 12 includes five pages of groundwater monitoring data. Ecology's review focused on data collected within Capital's RI study area. The table includes a SL row at the bottom of each page that is titled "MTCA Method C Modified Screening Level..." The SLs provided, however, appear to be taken from Table 2 and are not Method C values. **Ecology's approval of Table 12 does not, therefore, include the words "MTCA Method C Modified" preceding "Screening Level for...Zones."**

Table 15

134. The table's plume length value of 1730 feet is greater than any individual source-to-terminus distance. During FS modeling, plume lengths for estimating dispersivity should be varied based on the different distances from the various sources to the Waterway. Since higher dispersivity values – due to the use of excessive plume length distances – will result in lower discharge concentrations, the cVOC impact to the Waterway in the future may be underestimated.

    In addition, source concentrations presented in the table are inconsistent with the model input sheets presented in Appendix H; the discrepancy should be resolved during future modeling efforts.

Table 16

135. The output concentrations for various sources are inconsistent with Appendix H output sheets. The discrepancies should be resolved during future modeling efforts.

FIGURES

136. Ecology has three general comments about the figures included in the revised RI Report:

a) A number of figures are stamped "DRAFT." Ecology is unsure why Capital felt it needed to qualify the figures in this manner, especially in a Report it was asking Ecology to approve. During our review we ignored the qualification and assumed Capital did not intend to later send us *final* replacement figures (i.e., we assumed these were the "final" figures). If Ecology's assumption is incorrect, please notify us as soon as possible.

b) In future reports (such as the draft FS Report) Capital should also include figures that depict 1,1-DCE and cis-1,2-DCE groundwater concentrations (per zone). Concentrations of the latter compound should be shown even if measured levels are below groundwater SLs.

c) PSC has noted in their comments that:

- the iso-concentration contours on Figures 10 through 33 "reflect only the concentrations detected in groundwater samples collected during the individual monitoring event depicted on each figure." Since analytical data only exist for wells that are sampled, "[w]ells that are not sampled are therefore treated as if the wells themselves do not exist. As a result, the dimensions of the plumes fluctuate on the basis of what wells were sampled and isolated hot-spots appear and disappear depending on whether a well was sampled or not"; and,

- groundwater analytical data "from reconnaissance borings are excluded from the contouring data set." In "areas where elevated concentrations of HVOCs have been detected in groundwater do not generally disappear simply because a monitoring well is not co-located at that exact location and repeatedly sampled."

In future reports (such as the draft FS Report, or FS deliverables prepared prior to the Report) Capital should therefore prepare contoured figures that comprehensively illustrate the best approximation of current COC levels in each groundwater zone. Contoured figures in future FS documents should also include data collected from Capital's newest wells (no iso-concentration contours are drawn on the Report's Figures 17, 25, and 33).[21]

[21] Figure 25 is apparently mis-titled. June 2012 data are shown.

Appendix B

137. New tidal study data from July/August 2011 and April 2012 are presented in the appendix. Several pressure transducers used during these periods showed data *drift* (gradually increasing or decreasing pressure readings) or *shift* (abrupt change/shift in pressure readings). Ecology recommends that Capital check with the transducer manufacturer to determine the nature of these problems. The affected transducers and datasets appear to include:

- CI-12-WT July 30- August 2, 2011 data (up-drifting at the end)
- CI-14-WT July 30- August 2, 2011 data (down-drifting at the end)
- CI-10-WT April 21-23, 2012 data (up-shifting at the end)
- CI-10-35 April 21-23, 2012 data (down-shifting at the end)
- CI-10-65 April 21-23, 2012 data (down-shifting at the end)
- CI-14-WT April 21-23, 2012 data (apparent continuous up-drifting)

Data interpretations should always, and consistently, consider recording errors.

138. The contents of Appendix B are poorly organized. The last six groundwater elevation contour maps in the appendix are all labeled Figure 2.

In addition, the intermediate zone tidally-averaged groundwater elevation contour map (Figure 2) shows a steep gradient between wells CI-14 and CI-13. This is because of the low groundwater elevation calculated from CI-13-60 measurements (4.65 feet). The steep gradient and low groundwater elevation at CI-13-60 were not observed during the August 2010 tidal study (Figure 8) or in April 2012. Nor does the hydrograph associated with monitoring well CI-13-60 during the August 2011 tidal study show any abnormality. Further characterization of the hydraulic gradient (i.e., observations and tracking of variations/trends) should be carefully conducted in this area (from well CI-14 to Slip 2) during the FS.

Appendix C

139. The data gap analysis provided in Appendix C was prepared by Capital following issuance of Ecology's September 2011 letter, responding to the draft RI Report. Capital's analysis was helpful in facilitating decisions regarding which data gaps needed to be filled prior to preparation of the revised Report and Ecology has no objection to its inclusion in the Report. However, Ecology's approval of the RI Report should not be understood to imply full concurrence with Capital's analysis. The analysis represents Capital's views on data gaps and not necessarily Ecology's.

During our review of the revised RI Report Ecology re-reviewed only the material in Appendix C associated with work and soil sampling at Plant 2. This more recent review was focused on identifying any information that did not appear to be presented (or was perhaps presented differently) in chapter 5 of the Report. The comments

below, then, supplement those contained in Comments #16 and 17, where we attempted to summarize chapter 5's Plant 2 soil contamination discussion.

- Following the discussion of work that was completed at Plant 2 prior to any ECS sampling, Capital's data gap analysis states that this work "indicates with reasonable certainty that there is no ongoing source of TCE in soil above the groundwater table at Plant 2." This may be Capital's position, but Ecology does not share it (as we have noted in a number of comments above). That is, it is possible that no "ongoing source" of TCE is currently present in soils beneath Plant 2, but Ecology believes there is a great deal of uncertainty associated with this question. In fact, our understanding is that the later ECS work was, at least in part, an attempt to reduce this high degree of uncertainty.

- Capital's data gap analysis states that sampling "in and surrounding" the Plant 2 canopy area included seven sampling locations. The analysis says that PCE and TCE were not detected at six of these locations; only PCE was detected and only at one location (ECS35, at 3.8' bgs). However, according to Figure 5, ECS37, -36, -35, and -34 were located within the canopy area. B2 and MW2 were also located within that area. Besides the detection noted at ECS35, a PCE measurement of "0.5J" is shown for ECS34 (at 6.9'). TCE and cis-1,2-DCE were both detected at MW2 (at 8.5-9').

Appendix F

140. Appendix F includes several tables associated with Capital's Tier 3 VI work. Please note:
    - Ecology understands that the IPIMALs identified in these tables were concentration values used at the time of the individual Tier 3 assessments. But a number of the IPIMALs have subsequently changed and Ecology's approval of the RI Report does not imply that the values presented in Appendix F are currently correct. Comments on IPIMAL values are provided above in Ecology's response to Table 3 of the Report.
    - It does not appear that any tables contain data associated with the Tier 3 investigation of the Gull-owned building.
    - Tables are presented out of order and appear to possibly be copies of tables contained in previous reports. So, for example, there are multiple Table 1s and Table 3s; Table 3 follows Table 5, which is then followed by Table 2.

Appendix H

141. BIOCHLOR data sheets are presented in this appendix. Ecology found several problems (see *a* through *c* below) with the data sheets, and **for this reason Appendix H is not included in the approved final RI Report**. If modeling is performed during the FS to support the evaluation of remedial alternatives, Capital should resolve the problems noted below:

a) There is only one set of data sheets presented for all modeling runs (three for the WT Zone, two for the Shallow Zone, and one for the Intermediate Zone). Input source concentrations are inconsistent with either the maximum or the average input concentrations listed in Table 15. These Appendix H input concentrations are less than the maximum concentrations in most cases and less than the average concentration for some contaminants
b) The peak concentration runs specified in Table 16 (identified as 15, 20, and 25 years) are not included in Appendix H.
c) The sensitivity runs presented in Table 17 and decaying source runs listed in Table 16 are not included in Appendix H.

Appendix I

142. A minor point of clarification, but the TEEE form in Appendix I has the second exclusion criterion circled (as well as the third). Capital should be aware that if the exclusion is based on this second criterion (ground cover), an institutional control is required.

ENCLOSURE B

Capital Industries
October 2012 Revised RI Report
Environment International[22] comments [received October 29, 2012]

We have finished reviewing the Capital Industries RI report on behalf of the Georgetown Community Council, and we have a few more comments on this report than we did for the Art Brass RI report. These all relate to comments that we made previously that were not addressed at all or were only partially addressed.

1. The report still lacks an executive summary.

2. The process by which the originally identified COPCs were reduced to a smaller list of COCs is still not fully described (section 3.3). See Art Brass RI report's Section 7.1 for a better approach (which is not longer, just provides clearer information).

3. The determination of the area of investigation still does not explain why the area doesn't extend to the Duwamish.

4. We requested inclusion of a list of "sentinel wells" located at or near the Duwamish Waterway that are positioned to intersect any contamination in each zone originating at Capital Industries. Art Brass was able to provide this list for the wells relevant to their area of investigation but CI's report remains silent on this topic.

5. We previously made a pair of comments regarding the first two paragraphs of section 6.2.4.3, neither of which was addressed:
    a. Section 6.2.4.3, first paragraph: TCE was detected above screening levels in June 2010, according to isoconcentration map for intermediate zone (now Figure 27); the sentence that says "PCE and TCE were not detected in monitoring wells exceeding screening levels in the Intermediate Zone" should be corrected.
    b. Section 6.2.4.3, second paragraph: Our original comment said that the report should provide the basis for the statement about concentrations increasing to northwest. This comment was not addressed, and it is still unclear that concentrations are increasing to NW. The basis for the statement that a likely source is located upgradient (p.6-26) is also not clear and should be explicitly spelled out.
    c. In addition to the preceding comments (which are duplicated from our comments on the original draft), we would like to point out that the figure references in the first paragraph of section 6.2.4.3 are wrong and should be corrected.

[22] submitted on behalf of the Georgetown Community Council

6. Section 6.4.3.1 was slightly edited, perhaps in response to our previous comment:

> *"The report should provide more monitoring data to support the statement that natural attenuation is responsible for lower levels of PCE and TCE and higher levels of VC (there may be more VC migrating onto site as opposed to degradation of existing contamination)."*

However, the edits do not actually provide any more monitoring data or explanation as to how a source of VC was ruled out. Additionally, if natural attenuation is resulting in a process of anaerobic degradation that is "stalling" at VC, that is not a desirable outcome, especially given that modeling results show that VC may (under conservative assumptions) discharge to the LDW at concentrations exceeding the screening level.

Thank you for your attention to these comments.

ENCLOSURE C

Capital Industries
October 2012 Revised RI Report
Art Brass Plating comments [received November 15, 2012]

Aspect CONSULTING

November 12, 2012

Ed Jones
Washington State Department of Ecology
3190 160th Avenue SE
Bellevue, Washington 98008-5452

Re: Comments on Capital Industries Revised Draft RI Report
Project No. 050067

Dear Mr. Jones:

On behalf of Art Brass Plating (ABP), we submit this letter with technical comments on the Revised Draft Remedial Investigation (RI) Report submitted by Capital Industries (CI), dated October 2012. These comments are provided for Ecology's consideration when reviewing the west-of-Fourth Avenue South conditions as addressed separately by each PLP, with reference to specific report sections/pages where appropriate.

Art Brass Plating as an Upgradient Source

In several places in their RI report, CI refers to ABP as an upgradient source of contamination of groundwater in the CI study area. ABP does not agree with these generalizations of the data and would like to make the following clarifying points:

- In sections 6.1.2.1 and 6.2.4.3, CI hypothesizes that ABP is a contributing source of vinyl chloride in the Shallow and Intermediate Intervals in the areas of Plant 1 and 5. Vinyl chloride in groundwater is an area-wide issue, and ABP does not agree with CI's interpretation based on the following:
  - When the vinyl chloride data is interpreted with all W4 water level data, the data indicate that CI, Blaser Die Casting (BDC), and Philip Services Corporation (PSC) are more likely to act as upgradient sources of elevated vinyl chloride at PSC-CG-141-40.
  - As a line of evidence, CI states that well cluster MW-17 and borings SPO-17, SPO-18, and SPO-19 are located upgradient of Capital Plant 5. A review of both Shallow and Intermediate Interval groundwater contour maps clearly indicates that these explorations are located cross-gradient of Plant 5.
  - Along 1st Avenue South, data indicate that the ABP plume centerline is located near ABP explorations SPO-18 and MW-17-40 and that concentrations decrease south of the centerline before increasing again in the CI study area. This pattern is clearly illustrated with the distribution of TCE and total chlorinated ethene concentrations in groundwater (refer to ABP RI Figures 15 and 19). We attached a modified version of Figure 19 showing total chlorinated ethene concentrations in groundwater (i.e., sum of chlorinated ethenes, expressed as molar concentrations) to illustrate this point. Groundwater data from ECS presented in the CI RI report have been added to the figure and it is annotated with select exploration IDs referred to in this letter. The transect defined by SPO-17, SPO-18, and SPO-19 confirms the ABP plume centerline, defined by the highest total chlorinated ethene concentrations, is close to the centerline delineated by TCE data. At the Shallow Interval,

the highest concentrations of total chlorinated ethenes at SPO-17, SPO-18, and SPO-19 are 3.7, 34, and 2 µmol/L, respectively. Monitoring well data from MW-17-40 and MW-20-40, near probes SPO-18 and SPO-19, respectively, are consistent with the reconnaissance probe data.

Extending this transect south along 1st Avenue, total chlorinated ethene concentrations remain similar to values at SPO-19, with a concentration of 2 µmol/L at CI-B28, and then increase relative to values at SPO-19 with concentrations of 12.5, 3.4, and 4.4 µmol/L at ECS14, PSC-CG-141 and CI-B10, respectively.

- Groundwater probe data not presented in the CI RI report demonstrate high concentrations of vinyl chloride emanating from the CI property that are even less plausibly connected to an ABP release. The data collected from probe PSC-K23, located about 500 feet east in the CI Plant 2 canopy area, indicates a significant amount of vinyl chloride in groundwater upgradient/cross-gradient of the PSC-CG-141 well cluster. In the Shallow Interval at PSC-K23, vinyl chloride concentrations range up to 597 µg/L, more than twice the concentrations observed at the PSC-CG-141 well cluster, with total chlorinated ethene concentrations of up to 10 µmol/L. While the data from PSC-K23 was collected in 2002, it is still relevant because concentrations of vinyl chloride at PSC-CG-141 at that time were similar to what was detected in recent samples. Further, based on the groundwater velocity (66.2 feet per year) and retardation factor (2.25) used by CI in the RI fate and transport modeling, chlorinated VOCs at PSC-K23 would be expected to travel the 450 feet to PSC-CG-141 in approximately 15 years, such that concentrations measured at PSC-K23 in 2002 would still be arriving at PSC-CG-141.

- In Section 6.2.4.2, CI states that vinyl chloride detected in well CI-19-30 (adjacent to the Duwamish Waterway) represents the southern edge of the vinyl chloride plume from the ABP Facility. ABP does not agree. A review of the groundwater contour data for the Shallow Interval indicates that CI, BDC, and PSC are just as likely to contribute to the vinyl chloride detected at this well. The concentration at this well (1.7 µg/L in May 2012) is consistent with the diffuse area-wide vinyl chloride plume attributable to multiple sources. The vinyl chloride data contoured on Figure 24 of the CI RI report supports this assertion, showing a broad area with relatively low concentration (1.69 to 10 µg/L) of vinyl chloride extending well south of areas that could be conceivably impacted by releases at ABP, but clearly located downgradient of the CI and BDC facilities.

Clarification Regarding Pacific Food Systems Buildings

There has been confusion in the past about ABP's relationship with the Pacific Food Systems North Building and South Building, with a current single street address of at 5815 Fourth Avenue South. Based on a vapor intrusion assessment, the CI RI report identifies the North Building as requiring mitigation to address migration of PCE, TCE, and DCE vapors to indoor air and further identifies the soil beneath this building as a potential source of chlorinated VOCs to groundwater. We make this point of clarification because ABP operated at a nearby location, but we do not believe has contributed to the impacts at the North Building. This conclusion is based on the occupancy histories of the North Building and South Building (described below), as well as the fact that ABP never used PCE, one of the constituents detected at concentrations exceeding indoor air Inhalation Pathway Interim Measures Action Levels at the North Building.

Although ABP operated at 5815 Fourth Avenue South through the 1970s and early 1980s, at that time the address only applied to the South Building where ABP was located; the North Building

location was listed as 5811 Fourth Avenue South and was never occupied or otherwise used by ABP. The RI report correctly indicates that prior to Pacific Food Systems occupancy, the North Building was occupied by Wear-Cote NW, a nickel plating company, and by Advance Forklift, a forklift repair shop, but not ABP.

Implications for Feasibility Study

After reviewing the CI and BDC reports, we continue to believe that ABP should prepare a separate feasibility study for the following key reasons:

- For the ABP release, the groundwater to surface water exposure pathway to the Duwamish Waterway is complete. Data presented in the CI and BDC RI reports indicates that this exposure risk is not currently complete in their respective study areas;
- ABP TCE plume is discrete and separable from the other PLPs, and the total chlorinated ethene data provide a clear and technically defensible basis for separating areas of responsibility within the broader vinyl chloride plume;
- Fate and transport of TCE and the daughter products are different in the ABP study area, as TCE has undergone more degradation in the downgradient area south of ABP;
- ABP has implemented effective source controls and has consistently submitted on-time deliverables that integrate the sampling data produced by other PLPs. ABP has demonstrated effectiveness working within the multi-party setting; and
- ABP has demonstrated efficiency, with no issues to date, in taking lead responsibility in administering downgradient vapor intrusion requirements for relevant properties.

Considering these factors, a feasibility study for ABP would likely have different remedial action objectives and thus require different analyses to meet those objectives. Forcing a multi-PLP feasibility study process will result in substantial delays. The potential for delay in an imposed joint feasibility study effort is increased further when taking into account the reality of past communication and coordination challenges with joint work products for the west-of-Fourth Avenue South area. In addition, the environmental harm associated with ABP is readily divisible.

We appreciate the opportunity to provide these comments and welcome further discussion, as appropriate.

Sincerely,

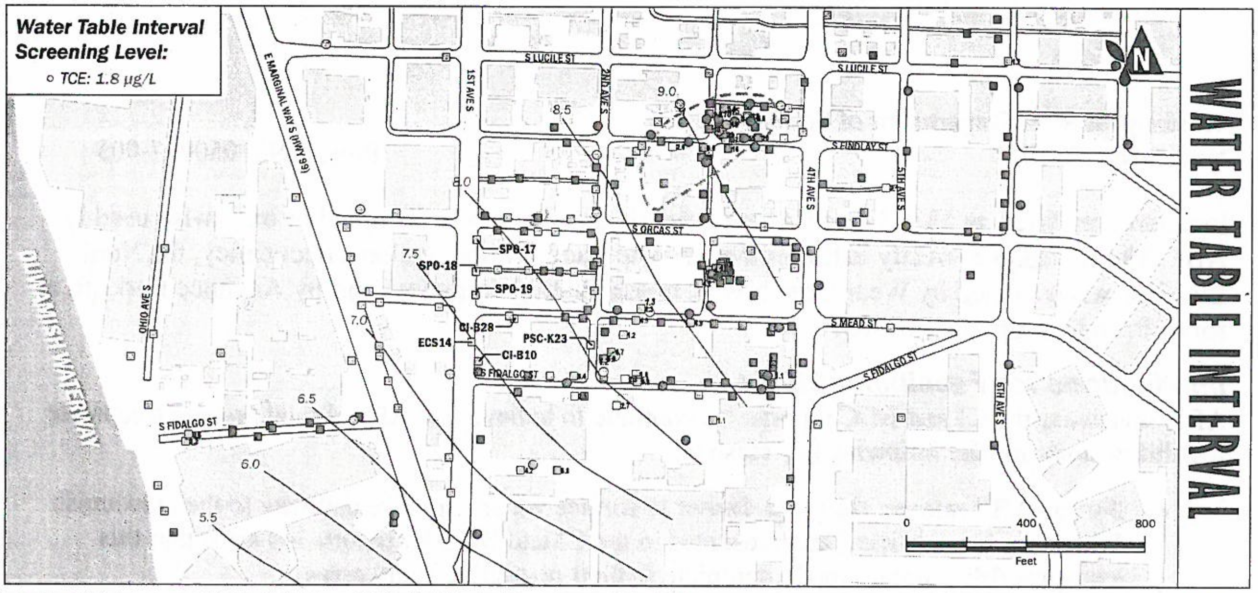
Aspect consulting, LLC

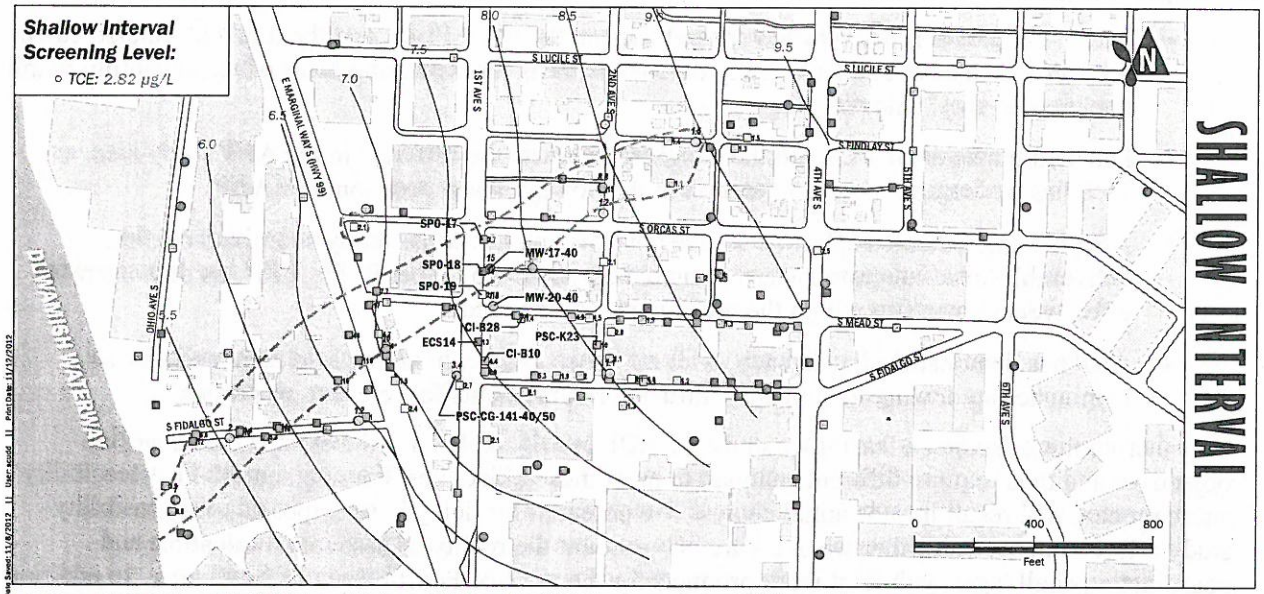
Doug Hillman, LHG
Principal Hydrogeologist
dhillman@aspectconsulting.com

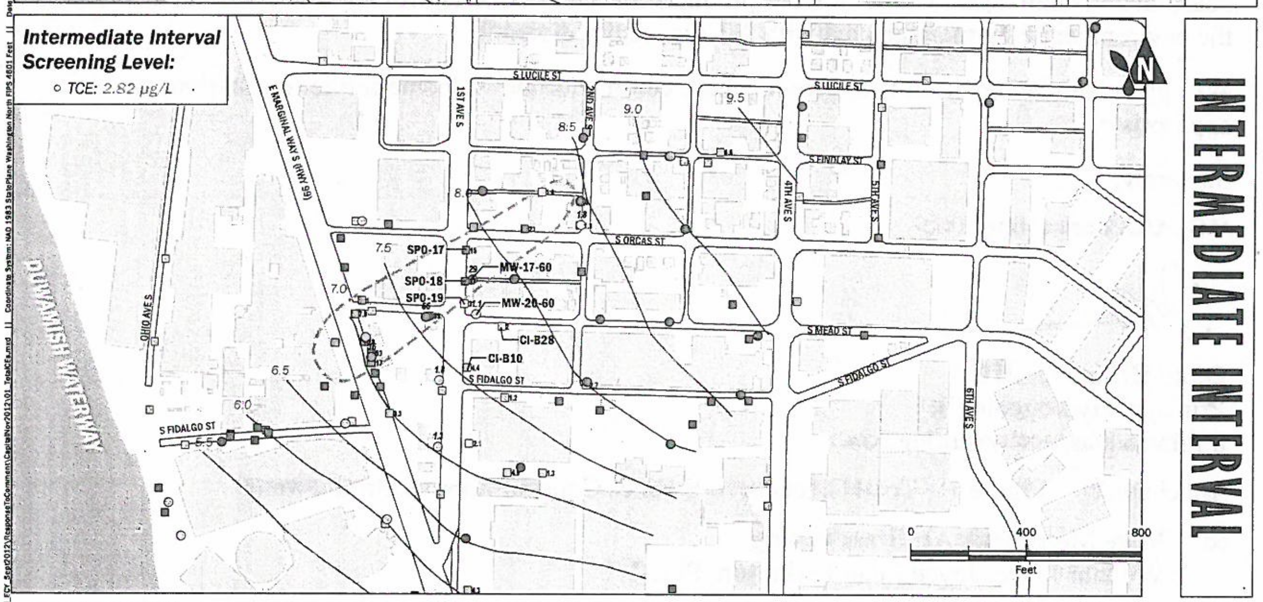
Attachment: Figure 1 – Total Chlorinated Ethenes Concentration in Groundwater

cc: Mike Merryfield, Art Brass Plating
William Joyce, Joyce Ziker Parkinson, PLLC

V:\050067 Art Brass Plating\Comments on CI RI Report\Aspect ltr to Ecology re Capital RI (11_12_12).docx







Groundwater Sample Locations:

- Well
- Geoprobe

Sample Location Symbol Color:

- Non-Detect
- <= 0.1 µmol/L
- <= 0.5 µmol/L
- <= 1.0 µmol/L
- <= 2.0 µmol/L
- <= 3.0 µmol/L
- <= 5.0 µmol/L
- <= 10 µmol/L
- <= 30 µmol/L
- >30 µmol/L

Data Notes:

Geoprobe data shown on this map reflects the maximum concentration detected at that sample location in the given interval.

Well data shown on this map reflects the most recent sample collected at that well in the given interval.

Data Labels:

Locations with detections above or equal to 1 µmol/L are labeled with the concentration.

40 Well Geoprobe

TCE Isoconcentration Line (at Screening Level)

8.0 Half-foot Groundwater Elevation Contours from August, 2012 Site-Wide Monitoring Event (NAVD88 Vertical Datum)

Plume Delineation: Total Chlorinated Ethenes

Art Brass Plating RI
Seattle, Washington

Aspect CONSULTING	NOV-2012	BY: JM / PPW	FIGURE NO.
	PROJECT NO. 050067	REV BY: SCC	1

ENCLOSURE D

Capital Industries
October 2012 Revised RI Report
PSC Environmental Services comments [received November 13, 2012]

PACIFIC CREST ENVIRONMENTAL
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TECHNICAL MEMORANDUM

TO: Mr. William Beck, PSC

FROM: Mr. William Carroll, L.H.G. WEC

cc: Ms. Marlys Palumbo

DATE: November 13, 2012

RE: **COMMENTS ON AGENCY REVIEW REVISED DRAFT REMEDIAL INVESTIGATION REPORT**
CAPITAL INDUSTRIES
SEATTLE, WASHINGTON
PACIFIC CREST NO. 115-001

This Technical Memorandum (Memorandum) presents PSC Environmental Services LLC (PSC) with Pacific Crest Environmental, LLC's (Pacific Crest's) technical comments on the Revised Draft Remedial Investigation (RI) Report dated October 2012 (2012 Draft RI Report). The 2012 Draft RI Report was prepared by Farallon Consulting, L.L.C. (Farallon) on behalf of Capital Industries, Inc. (CI) to comply with the Washington State Department of Ecology (Ecology) Agreed Order No. DE 5348 (Agreed Order). The Memorandum also incorporates PSC's technical comments on the 2012 Draft RI Report. The Agreed Order requires CI to conduct RI and other activities in response to the releases of halogenated volatile organic compounds (HVOCs) that occurred at the CI Facility located at 5801 3rd Avenue South in Seattle, Washington (CI Property).

Comments on the 2012 Draft RI Report

The 2012 Draft RI Report for the CI Investigation Area[1] is intended to present the results of investigations conducted to complete the RI for the CI Investigation Area and to present the results of interim measures conducted to reduce the concentrations of contaminants of concern (COCs) in media of concern. The information obtained during the RI was intended to be used to develop and evaluate interim measures and to conduct a feasibility study (FS) to assess remedial alternatives. Pacific Crest's general comments on the 2012 Draft RI Report are summarized below:

[1] The CI Investigation Area is generally defined as the area between Mead Street to the north, 4th Avenue South to the east; the Duwamish Water way to the west; and a diagonal extending from Slip 2 to approximately the intersection of Front Street and 4th Avenue to the south.

Hydrogeologic Setting

The 2012 Draft RI Report states that CI adopted PSC's nomenclature for the chemical characterization of aquifer zones; this statement is accurate for the Water Table and Shallow Zones, but inaccurate for the Intermediate Zone. PSC defines the Intermediate Zone as between 40 feet below ground surface (bgs) and the top of the silt aquitard at approximately 110 feet bgs, while CI defines the Intermediate Zone as between 40 feet bgs and 70 feet bgs. Ecology, in Comment #13 of the correspondence to CI dated May 28, 2008, expressed a preference that the West of 4th (W4) parties redefine the lower boundary of the Intermediate Zone on the basis of depth (between 60 feet bgs and 75 feet bgs), rather than on the basis of "hydraulic" features (i.e. the top of the silt aquitard). The 2012 Draft RI Report prepared by Aspect Consulting, LLC (Aspect) on behalf of Art Brass Plating, Inc. (ABP) defines the Intermediate Zone as samples collected from greater than 40 feet bgs. CI's selection of 70 feet bgs as the lower boundary of the Intermediate Zone appears to be an arbitrary decision that is not consistently applied throughout the W4 Investigation Area.

Off-Site Sources

CI identified the following two suspected HVOC source areas that are unrelated to CI's operations within the CI Investigation Area: CalPortland Facility at 5975 E. Marginal Way South and the Pacific Food Systems North Building at 5815 46th Avenue South. The 2012 Draft RI Report did not establish or make a claim that contamination associated with releases that occurred at these two facilities is distinct from, and not comingled with, contamination associated with the releases that occurred at the CI Facility. It is not clear from the 2012 Draft RI Report how this issue will be resolved. The presence of additional sources of contamination in the W4 Investigation Area will complicate the completion of a FS and needs to be resolved before the FS can begin.

Data Analysis Inconsistencies

Pacific Crest identified the following internal inconsistencies in the data analysis presented in the 2012 Draft RI Report:

- *Vertical Groundwater Gradients* –The 2012 Draft RI Report states that vertical gradients in groundwater are "negligible" on Page 5-25 and "relatively small and variable between zones" on Page 6-42. However, data presented in Appendix B of the 2012 Draft RI Report indicates that during the tidal study vertical gradients ranged from -0.0179 feet/foot to +0.0105 feet/foot. The magnitudes of the measured vertical gradients appear to increase with proximity to the Duwamish Waterway. Data presented in ABP's 2012 Draft RI Report concluded that vertical gradients are present near the Duwamish Waterway and have an influence on the migration of contaminants in groundwater. The text of the CI's 2012 Draft RI Report appears to be internally inconsistent and does not reflect independent and well supported data analysis presented by ABP regarding vertical gradients.
- *Groundwater Flow Direction* – On Page 5-26, the 2012 Draft RI Report states, "Groundwater flow direction is to the southwest toward the LDW. Little or no

deflection of the groundwater flow direction toward Slip 2 is noted." However, on the following page (Page 5-27), the report states, "Although minor variations in flow direction occur as a result of tidal influence, the flow direction within the Capital Area of Investigation remains predominantly southwest toward Slip 2 of the LDW during a tidal cycle." The report appears to present a contradictory analysis of groundwater flow direction in the vicinity of Slip 2.

- *Vapor Intrusion Cancer Cumulative Exceedance Factor* – The Cancer Cumulative Exceedance Factors (CCEFs) that are calculated for indoor air samples are based on indoor air screening levels. The indoor air screening levels are presented in Table 3 of the 2012 Draft RI Report. However, the CCEFs reported in Section 5.3.2 of the 2012 Draft RI Report for samples collected during Tier 3 Assessments conducted by CI appear to be based on outdated screening levels and should be revised.
- *Results for Iron and Manganese in Groundwater* – Section 5.2.8 of the 2012 Draft RI Report summarizes the analytical results for iron and manganese in groundwater. However, the data for dissolved manganese that are presented on Page 5-22 do not appear to match the data that are presented in Table 13. In addition, since the data for iron and manganese are not plotted on any figures, it's not clear how CI reached conclusions about the areal distribution of iron and manganese or the correlation between dissolved species and HVOCs in groundwater.
- *Hydraulic Conductivity Values* – Page 5-28 of the 2012 Draft RI Report states that the hydraulic conductivity values for the Water Table and Shallow Zones are between 100 to 200 feet per day (ft/day) and the hydraulic conductivity values for the Intermediate Zone are between 5 and 10 ft/day. However, CI used hydraulic conductivity values of 37 ft/day and 28 ft/day for the Water Table and Shallow Zones, respectively as representative values for modeling contaminant fate and transport with BIOCHLOR. The report's analysis of the sensitivity of the BIOCHLOR model indicates that the model results are sensitive to changes in the hydraulic conductivity. The use of hydraulic conductivity values that are lower than values stated in the report as representative of the CI Investigation Area is likely to result in model predictions that are not conservative and that underestimate the potential concentrations of contaminants that could reach the Duwamish Waterway.

Fate and Transport of Vinyl Chloride

Laboratory analyses of groundwater samples collected from within the Shallow and Intermediate zones and generally centered near well cluster CG-141 and CI Plant No. 1 and Plant No. 5 on 1st Avenue South between the intersections of 1st Avenue South and Mead Street and 1st Avenue South and Fidalgo Street have detected vinyl chloride (VC) at elevated concentrations. This feature of the W4 Investigation Area is unusual because of its areal extent and the lack of conventional "plume" definition that can be directly associated with a single source. Historically, there has been little consensus between the W4 potentially liable persons (PLPs) on the source(s) of VC in this area, and explanations have ranged from a "slug" associated solely with the releases of HVOCs that occurred at the PSC Facility, to releases of HVOCs that occurred from

multiple facilities that have become comingled. CI's 2012 Draft RI Report includes the following two contradictory explanations for this feature:

- *Explanation No. 1.* – Section 6.1.2 presents a discussion of the up-gradient source areas within the context of the conceptual site model. Section 6.1.2.1 states, "The ABP facility appears to be a contributing source of vinyl chloride detected in the Shallow and Intermediate Zones at Capital Plant 1 and Capital Plant 5." Section 6.1.2.3 further states, "A release(s) of COPCs from the PSC facility have migrated to and co-mingled with a release(s) at Capital Plant 2 and the Capital Plant 2 Canopy in the Shallow and Intermediate Zones." CI Plant No. 1 and CI Plant No. 5 are not referenced in Section 6.1.2.3.
- *Explanation No. 2* – Section 6.4 is titled Conceptual Site Model Summary. Section 6.4.1.2 states, "Concentrations of vinyl chloride are widespread across the Capital Area of Investigation in groundwater in the Shallow Zone, with concentrations increasing to the west suggesting a primary parent product (TCE) source area up-gradient to the northeast at the PSC facility." There is no discussion in Section 6.4.1.2 of the ABP facility as a source of VC concentrations in groundwater despite the fact that Section 6.4.1.2 is presented as a summary of the conceptual site model.

In comments on ABP's 2012 Draft RI Report, Pacific Crest presented an analysis of the potential for tidal influence to result in the formation of the observed asymmetric VC plume configuration which is consistent with ABP as a source of VC. The 2012 Draft RI Report provides no evidence to support the claim presented in Explanation No. 2 that PSC's facility is the sole source of VC.

Miscellaneous Comments

Comment No. 1 – The first four rows of Table 2 are identified as "Groundwater, Method B, Carcinogenic, Residential, Groundwater to Indoor Air." The values presented in the columns under the headings for tetrachloroethene, trichloroethene, trans-dichloroethene, and vinyl chloride are all different and appear to reflect alternate exposure parameters for residential and non-residential receptors. The row headings should be revised to reflect the actual receptor and the methodology for calculating the screening levels should be discussed in the text of the report.

Comment No. 2 – On the basis of Ecology's correspondence to Blaser Die Casting, Inc. (Blaser) dated October 2, 2012, the applicable screening level for VC in the Shallow and Intermediate Zones is 2.4 micrograms per liter (µg/L), not 1.69 µg/L.

Comment No. 3 – Iso-concentration contours of the laboratory analytical results for groundwater samples collected from monitoring wells during periodic groundwater monitoring events are illustrated on Figure 10 through Figure 33. The figures form the basis for the interpretation of the areal extent of HVOC concentrations in groundwater. The iso-concentration contours on each figure reflect only the concentrations detected in groundwater samples collected during the individual monitoring event depicted on each figure. This approach suffers from the following problems:

- Analytical data only exists for wells that are sampled. Wells not sampled during an event do not have any data associated with them and are not included in the contouring data set. Wells that are not sampled are therefore treated as if the wells themselves do not exist. As a result, the dimensions of the plumes fluctuate on the basis of what wells were sampled and isolated hot-spots appear and disappear depending on whether a well was sampled or not. This approach renders comparison of the plume extent possible only during monitoring events in which an identical set of wells have been sampled and creates the artificial impression that the plume extent is highly variable.
- Similarly, analytical data from reconnaissance borings are excluded from the contouring data set. Data from reconnaissance borings may represent only a snap-shot of groundwater conditions at the time of the sample, but areas where elevated concentrations of HVOCs have been detected in groundwater do not generally disappear simply because a monitoring well is not co-located at that exact location and repeatedly sampled.

As a result of the problems described above, Figure 10 through Figure 33 each illustrate a limited subset of the available data. The 2012 Draft RI Report does not include a figure that synthesizes the larger data set into a comprehensive illustration of the extent of concentrations of HVOCs in groundwater.

Conclusions

CI's 2012 Draft RI Report presents a comprehensive summary of the data collected to date within the CI Investigation Area. However, discussions of the conceptual site model relating to the hydrogeologic setting (e.g. vertical gradients, flow direction, hydraulic conductivity) and attribution of sources of contamination are internally inconsistent and in some cases contradictory. It also appears that figures with iso-concentration contours based on a limited subset of the available data form the basis of many of the report's conclusions. The 2012 Draft RI Report should be revised to include a synthesis of the RI data that presents an internally consistent conceptual site model and any statements regarding source attribution should be rigorously supported with data or presented as CI's opinions.

ENCLOSURE E

Capital Industries
October 2012 Revised RI Report
CalPortland comments [received November 16, 2012]

CALPORTLAND

November 15, 2012

Department of Ecology
Northwest Regional Office
3190 - 160th Avenue SE
Bellevue, WA 98008

Attn: Ed Jones, Environmental Engineer

Subject: CalPortland Comments on Capital Industries Inc. Revised Draft Remedial Investigation Report

Dear Mr. Jones:

CalPortland has received the Revised Draft Remedial Investigation Report ("Report") dated October 2012 from Capital Industries. We carefully reviewed this report and also engaged an independent third party consultant to evaluate the contents of the report.

CalPortland strongly disagrees with the Report's assertion that a source of HVOC's exists on CalPortland's property. The wells installed by Capital Industries on CalPortland's property, CI-18 and CI-17, were sampled in May and June 2012. An isolated sampling event in May at CI-17 WT showed PCE above the screening level while the subsequent sampling done in June showed a greater than 6 fold decrease in PCE to a level substantially below the screening level. The analytical results for this single sample are insufficient to identify CalPortland as an HVOC source in the Capital Industries investigation and CalPortland refutes this assertion made by Capital.

An independent review conducted by G-Logics of the Revised RI Report is enclosed. This analysis by G-Logics arrived at the same conclusion as CalPortland's internal review and determined that CalPortland is not a plausible source of HVOC's. The G-Logics paper also indicates another possible offsite HVOC pathway following the historic meander of the Duwamish River. The former Duwamish riverbed is a likely preferential pathway for the movement of groundwater and contaminants. Significantly large areas within the historic river bed down gradient of Capital have not been assessed for ground water contamination. Please refer to the G-Logics paper for further details and schematic.

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It also is important to note that CalPortland produces ready mixed concrete from sand, gravel and cement and does not utilize products containing PCE or TCE. Vehicle maintenance is done within an enclosed shop well to the north of the CI-17. Well CI-13, which is located in close vicinity to the shop, has been sampled six times without detection of PCE and TCE. The shop is not a source of HVOC's nor is the larger CalPortland site.

Please contact me at (206) 764-3021 if you have any questions concerning this response.

Sincerely,

Matthew L. Hinck
Environmental Manager, Washington Division

Enclosure: G-Logics Report 01-0272-E

Cc: Akos Fekete – Farallon Consulting
Ron Taylor – Capital Industries Inc.
Scott Isaacson – CalPortland
Doug Anderson - CalPortland

g-logics

Logical Solutions for Complex Problems

November 12, 2012
G-Logics Project Number 01-0272-E

CalPortland
Mr. Matthew Hinck
PO Box 1730
Seattle, WA 98111-1730

Subject: Preliminary Review of Revised Draft Remedial Investigation Report
Capital Industries Incorporated
Prepared by Farallon Consulting
October 2012

Dear Mr. Hinck:

G-Logics has reviewed the subject report per your request. This report concludes that CalPortland is a "source" of chlorinated solvents. However, based on our review of the information in this report, we cannot come to the same conclusion. This memorandum summarizes background information, the conclusions reached in the report, and the data gaps that we have identified.

Background

Farallon Consulting has prepared this report to summarize the discovered nature and extent of environmental contamination caused by a release of halogenated volatile organic compounds (HVOCs) at the Capital Industries facility (located at 5801 3rd Ave. South). Upgradient sources of chlorinated solvents also are understood to be present in this area of Georgetown, notably caused by releases at the former Philip Services Corporation facility.

As part of the work conducted by Farallon, numerous groundwater-monitoring wells were installed and sampled in locations downgradient of Capital Industries. As information was

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01-0272-E-Letter.doc

developed, additional monitoring wells were installed and sampled to better assess the lateral and vertical extent of groundwater contamination originating from Capital Industries.

As part of this investigative work, several monitoring wells were installed on CalPortland's properties. Specifically, a well cluster (three wells screened at different depths) was installed southeast of the office building (CI-13), two wells south of the maintenance building (CI-17), and two wells east of the plant operations (CI-18). These wells were installed with intent to assess contaminant concentrations at the distal end of the plumes, prior to groundwater discharging into the Lower Duwamish Waterway (LDW).

The wells located at CI-13 have been sampled six separate times (four times for the deepest well) beginning in June 2010. The wells located at CI-17 and CI-18 only have been sampled twice; in May of 2012 and in June of 2012.

Source Statements

Based on the analytical results for samples collected from these well clusters, Farallon has drawn a conclusion that CalPortland is a source of HVOCs. Copied from the draft report, these statements are listed below.

Report Section	Statement Regarding CalPortland
5.25	PCE was detected at concentrations exceeding the screening level the May 2012 monitoring event in monitoring well MW-17-WT, located on the CalPortland property near the LDW.
6.1.3.2	The results of the groundwater monitoring conducted for the RI have identified a source of HVOCs to groundwater on the CalPortland property located at the southern end of the Capital Area of Investigation near Slip 2 of the LDW at 5975 E. Marginal Way S. in Seattle, Washington (Figure 2).

6.1.3.2	The detection of PCE and TCE and groundwater in the Water Table Zone in monitoring well CI-17-WT, which were not detected in groundwater in the Water Table Zone in up-gradient wells, indicates a release of PCE and TCE on the CalPortland property.
6.1.3.2	The detection of concentrations of PCE and TCE in groundwater in The Water Table Zone and not in the deeper Shallow Zone in monitoring wells CI-17-30 indicates a release of PCE and TCE on the CalPortland property.
6.2.4.1	The concentrations of PCE, TCE, cis-1,2-DCE, and vinyl chloride increase in well CI-17-WT compared to concentrations in up-gradient wells, indicating a separate source on the CalPortland property.
6.2.5.2	However, sources on the CalPortland property have released HVOCs near the LDW, and therefore the modeling results cannot be confirmed.
6.4.1	The sources of the COPCs include the Capital Property; the BDC, PSC, and ABP facilities; the CalPortland property; and a former tenant at the Pacific Food Systems North Building.
6.4.2	A down-gradient source of HVOCs to groundwater has been identified at the CalPortland property, adjacent to Slip 2 of the LDW.
7.1.2	Other sources include releases from the BDC, ABP, and PSC facilities, the Pacific Food Systems North Building; and the CalPortland facility.
7.1.4	There is a source of PCE, TCE, and vinyl chloride in the Water Table Zone at the CalPortland facility adjacent to Slip 2, which prevents conclusive monitoring of the down-gradient edge of the contaminant plumes at well cluster location CI-17.

Data Gaps

Based on G-Logics review of the analytical results, for samples collected from these well clusters and those collected from up-gradient wells, G-Logics cannot draw the same conclusions. Specifically, it is our professional opinion that Farallon is premature in their conclusions regarding CalPortland, for the following reasons.

- Farallon frequently reports that PCE was found above the screening level in well MW-17-WT (CI-17-WT) in the May 2012 sample. However, it is never mentioned that PCE was found not to be above the screening level (found at a low concentration of 0.85 ug/L) during the subsequent groundwater sampling of the same well (conducted in June 2012). A common practice in the environmental-consulting industry is to sample a well multiple times in order to verify initial results. Given these order-of-magnitude different results and only two sampling events, this makes the initial data suspect and unreliable.

- The issue is further confused by Farallon using two names for this well, more frequently tabulated and mapped as CI-17-WT. We could not find where the report noted a name change, making it difficult to search and track this information throughout the report.

- Section 3.4 of this report indicates that "results of the investigation at the CalPortland property" can be found in Section 3.1.3 .25. However, this referenced section does not apparently exist within this report.

- The report also fails to assess the potential contaminant pathways due to the original location of the Duwamish River. Specifically, the Duwamish River was straightened and dredged in 1906 to accommodate ship travel up and down the river. Historical maps of the Capital Area of Investigation show an oxbow of the Duwamish south of Fidalgo Street. Slip 2 is a remnant of this oxbow. The former riverbed, which was filled with the straightening of Duwamish River, very likely is a preferential pathway for the movement of groundwater and the migration of contaminants.

- To assist in this review, G-Logics has overlaid the location of the former riverbed onto Figure 7 from the draft Remedial Investigation Report (attached diagram). To simplify this review, we also placed markers at locations where PCE was found in the Water Table Zone at concentrations above screening levels. We further plotted maximum concentrations measured, regardless of the number of samples.

- After review of the sampling locations, minimal wells are located within areas of the former river bed. Additionally, the northern portion of the former riverbed has not been sampled in areas downgradient of Capital Industries, except for the location of the CI-17 wells on the CalPortland property.

- As can be seen on this diagram, significantly large areas downgradient of Capital Industries has not been assessed for PCE or other HVOCs in the groundwater. Looking at this diagram and given the understood groundwater-flow directions to the southwest, elevated contaminant concentrations originating at the Capital Industry properties could migrate within northern portions of the former riverbed. Furthermore, following this preferential pathway, contaminants would flow through the southern portions of the CalPortland property and exit into the LDW (Slip 2 area).

Summary

It is G-Logics professional opinion that the singular detection of elevated PCE concentrations in well CI-17-WT is not sufficient evidence to conclude that a separate "source" of HVOCs originated at the CalPortland properties. A more likely source of this PCE is the known release of solvent contaminants at Capital Industries; with groundwater contaminants migrating in the former meander channel. Groundwater within this channel would discharge to the Lower Demolish Waterway while passing through the CalPortland properties. Additional groundwater characterization of the former meander channel, particularly in areas upgradient of well CI-17-WT, would confirm this understanding.

Closing

G-Logics appreciates the opportunity to provide our services to the CalPortland. Should you have any questions regarding this information, please contact us at your convenience.

Sincerely,
G-Logics, Inc.

Rory L. Galloway, LG, LHG
Principal