



STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

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September 23, 2014

Ms. Kim Jolitz
Chevron Environmental Management Company
6101 Bollinger Canyon Road
San Ramon, CA 94583

Re: Unocal Edmonds Bulk Fuel Terminal – Review of *Proposed Addendum to the Draft Feasibility Study Report, Former Unocal Edmonds Bulk Fuel Terminal*, dated August 11, 2014

Dear Ms. Jolitz:

The Department of Ecology (Ecology) has reviewed the *Proposed Addendum to the Draft Feasibility Study Report, Former Unocal Edmonds Bulk Fuel Terminal*, dated August 11, 2014 (*Proposed Addendum*). This letter transmits our formal review comments. Additional comments will be forwarded by email in a Word File of the Proposed Addendum, which will include comments by Ecology, the Washington State Department of Transportation (WSDOT), and the Edmonds Citizens Awareness Committee (ECAC).

We agree that the Disproportionate Cost Analysis (DCA) contained in the *Proposed Addendum* demonstrates that Alternative 6 is the alternative that is Permanent to the Maximum Extent Practicable. Alternative 6 uses excavation of the Detention Basin 2 (DB-2) and use of Dual-Phase Extraction (DPE) to address impacts remaining in the vicinity of the WSDT stormwater line area is the alternative that is permanent.

Ecology notes, however, that the outcome of the DCA is sensitive to the rank assigned to the Long-Term Effectiveness criterion of the DCA. Assessment of Long-Term Effectiveness includes the degree of certainty that the alternative will be successful. The DCA assigned a rank of 2 to the Long-Term Effectiveness criterion in both the First Pass and Second Pass analyses. A change in the rank from 2 to 3.3 in both passes results in a reversal of the final weighted sums such that Alternative 4 comes out the alternative that is Permanent to the Maximum Extent Practicable. These rankings are, of course, rather qualitative.

There is uncertainty regarding whether DPE will be as effective as necessary to achieve the TPH soil cleanup level within approximately five years and the TPH groundwater cleanup within approximately six years, as stated in §2.1.4 of the subject document. This is reflected in several areas of the *Proposed Addendum*.



- First, ECAC comments have noted the uncertainty in the groundwater modeling performed for the Feasibility Study. This is not surprising, as all models have uncertainty based on the assumptions made in the course of the modeling.
- Second, §2.3.5.2, third bullet, of the *Proposed Addendum* notes that excavation, "... offers a low risk of treatment process going wrong." In the context of the *Proposed Addendum*, this indicates that there is a greater chance of the DPE system not performing as anticipated compared to excavation in the WSDOT stormwater line area, which is Alternative 4.
- Third, Restoration Time Frames were estimated using a TPH mixture represented by a single hypothetical reference chemical with average fate and transport properties (§2.1.3). This is a key assumption in assessing the viability of DPE to achieve cleanup levels within the estimated time frame.
- Fourth, §2.1 states that, "To best manage the uncertainty in predicted quantities, a DPE Pilot Study will be performed in a portion of the target cleanup zone to collect field data needed to complete the final design." Ecology notes that WAC 173-340-350(9)(c) states that, "The department may require treatability studies [as part of a Feasibility Study] as necessary to provide sufficient information to develop and evaluate cleanup action alternatives for a site." That groundwater conditions and the properties of the TPH at the Site are such that cleanup levels will be achieved within the estimated Restoration Time Frames of five years for soil and six years for groundwater must be verified by field measurement. This is best done by implementing the full DPE system to assess potential variability in conditions along the WSDOT stormwater line. Of course, a Pilot Study may be done as part of the implementation.

Ecology recognizes the advantages of Alternative 6, In Situ Treatment with DPE compared to Alternative 4, Excavation, in the WSDOT stormwater line area. However, given the uncertainties inherent in the approach, Ecology believes it is more appropriate to implement Alternative 6 as a continuation of the current Interim Action under the current Agreed Order (Agreed Order No. DE 4460). This accords well with provisions of the Interim Action Work Plan, Exhibit B of the Agreed Order. The Introduction, §1 of the Order, provides specific objectives of the interim action. Of the objectives listed applicable to Alternative 6, Alternative 6 will meet them as follows:

- **Objective:** Remediate the petroleum hydrocarbon-impacted soil within the lower yard that contains petroleum hydrocarbon concentrations above the soil remediation levels (RELs) or soil cleanup levels (CULs) based on direct contact. **Alternative 6 meets this by** excavation soil in the DB-2 vicinity and by in situ remediation of soil in the WSDOT stormwater area. In essence, Alternative 6 is simply completing this requirement of the Agreed Order.
- **Objective:** Remove the remaining floating petroleum product beneath the lower yard. **Alternative 6 meets this by** excavating the DB-2 vicinity, where floating product has

been observed. This meets the requirement of Interim Action Work Plan §6.2.5 that, “If measurable free product (at least 0.01 feet thick) is encountered in a well, the product will be removed by bailing methods. If measurable product is encountered in a well more than two times, the interim action will be modified to remove that product by additional excavation.”

- **Objective:** Extract the petroleum hydrocarbon-impacted groundwater that is in contact with the floating petroleum product. **Alternative 6 meets this by** excavating the DB-2 vicinity.
- **Objective:** Obtain the data necessary to determine if the remaining soil concentrations are sources of free product on the groundwater table. **Alternative 6 meets this by** compliance monitoring conducted during and after implementation.
- **Objective:** Obtain the data necessary to determine if the remaining soil concentrations will cause an exceedance of the groundwater CULs at the groundwater points of compliance (POCs). **Alternative 6 meets this by** compliance monitoring conducted during and after implementation. Note that Ecology has determined that the standard point of compliance is appropriate for the Site. Interim actions conducted to date have demonstrated that reducing soil TPH concentrations to below the soil direct cleanup level will result in attainment of groundwater cleanup levels.
- **Objective:** Obtain the data necessary to determine if the petroleum hydrocarbon concentrations in the groundwater beneath the lower yard will naturally attenuate to below the CULs at the groundwater POCs. **Alternative 6 meets this by** compliance monitoring conducted during and after implementation.
- **Objective:** Obtain the data necessary to calculate the restoration timeframes to meet the groundwater CULs at the groundwater POCs. **Alternative 6 meets this by** compliance monitoring conducted during and after implementation. If the estimated Restoration Time Frames of five years for soil and six years for groundwater are not met, this data will be necessary to assess what further steps should be taken to clean up the Site.

Ecology believes that implementing Alternative 6 as a continuation of the interim actions required by Agreed Order No. DE 4460 will best meet Chevron’s objective of addressing the WSDOT stormwater line area with in situ techniques and while providing Ecology with increased certainty that DPE will be effective before proceeding to a Consent Decree with attached Cleanup Action Plan. Increased certainty that Alternative 6 will perform as Chevron anticipates is also a concern of the public as evidenced by comments from ECAC and WSDOT.

Implementing Alternative 6 as a continuation of the interim actions required by Agreed Order No. DE 4460 may also offer more flexibility in selecting a final action in a Consent Decree with Cleanup Action Plan because system performance can be observed before making final decisions. Implementing Alternative 6 in a Consent Decree with Cleanup Action Plan would

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require very specific contingency actions, and triggers for those actions, be developed up front, before the system was installed. The contingency actions and triggers could only be changed by amending the Consent Decree.

Please submit for Ecology review, within 60 days of the date of this letter, a draft addendum to Agreed Order No. DE 4460 Exhibit B, the Interim Action Work Plan, to implement Alternative 6.

If you have any questions, please contact me at (425) 649-7200 or by email at david.south@ecy.wa.gov.

Sincerely,



David L. South
Senior Engineer
Toxics Cleanup Program

cc: Charles Ellingson, Pacific Groundwater Group
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