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**DRAFT CLEANUP ACTION PLAN ADDENDUM
OFFSITE AREA
FORMER UNOCAL SEATTLE MARKETING
TERMINAL 0724
SEATTLE, WASHINGTON
ORDER ON CONSENT NO. DE-88-N223**

MARCH 7, 2005

**FOR
UNOCAL RRMCM**

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**DRAFT CLEANUP ACTION PLAN ADDENDUM
OFFSITE AREA
UNOCAL FORMER SEATTLE MARKETING TERMINAL
ORDER ON CONSENT DE88-N223**

EXECUTIVE SUMMARY

ES-1.0 CAP ADDENDUM

Unocal proposes to excavate an area of petroleum-contaminated soil in the Offsite Area (Figure 1). This action is referred to as a "hot spot" removal in this Cleanup Action Plan Addendum. Soil excavation was not selected as a preferred remedy for the Offsite Area in Unocal's Offsite Area Focused Feasibility Study (FFS) (June 9, 1997) and Unocal's Offsite Area Cleanup Action Plan (CAP) (June 18, 1997) primarily because soil excavation was not consistent with existing site uses (railroad, paved parking of Alaskan Way right-of-way, seawall, boardwalk, entrance to Myrtle Edwards Park and Trolley Barn). However, two years after publishing the FFS and CAP, Unocal sold the Upper and Lower Yards and redevelopment planning for the Olympic Sculpture Park (OSP) began. Based on the current understanding of the OSP redevelopment, it now appears that hot spot excavation is a feasible alternative because an area of petroleum-impacted soil in the Offsite Area will be accessible for excavation in 2005, as OSP earthwork and construction activities are initiated. Therefore, this CAP addendum is necessary to document the modification to Unocal's published CAP and to describe the work to be performed.

ES-2.0 OVERVIEW DESCRIPTION OF REMEDIAL ACTION

The primary objective of the hot spot excavation is to remove a source area of petroleum and light, nonaqueous phase liquid (LNAPL) in soil to improve groundwater quality in the Offsite Area. The hot spot excavation will occur during site earthwork associated with the Olympic Sculpture Park (OSP). The project schedule and staging and coordination between the Unocal and OSP efforts are further described in Section 2.0.

The proposed hot spot excavation area is shown in Figure 2. The excavated area encompasses approximately 12,000 square feet in plan dimensions; the excavation will extend to an average depth of 14 to 16 feet below existing grade (bgs). The proposed hot spot area was delineated based on the following criteria: (1) accessible and feasible for excavation (i.e., not beneath or adjacent to the railroad tracks or extraction Trench D and not beneath the current seawall relieving platform), (2) within the OSP redevelopment area for 2005, (3) comprises locations where groundwater quality is impacted by sheen based on 2003 to 2004 monitoring data (e.g., MW-36 and MW-72), (4) comprises accessible locations where LNAPL or sheen is or was documented or suspected to be present (e.g. MW-9, MW-68, RW-17 through RW-20 and PZ-18.5), (5) incorporates the accessible portion of Unocal's former pipe trench (now decommissioned) enabling removal of the former piping infrastructure as mandated by the City of Seattle, and (6) locations where removal of petroleum-impacted soil will improve downgradient water quality to accelerate eventual groundwater quality compliance per Unocal's requirements under the Order on Consent DE-88N223 (see Section ES 3.0). Although 1995 exploration work indicates that petroleum-contaminated soil extends as deep as approximately 22 feet bgs beneath the decommissioned Unocal pipe corridor (GeoEngineers' Supplemental Site Characterization report dated June 28, 1996) the base of the proposed hot spot excavation is limited to 14 to 16 feet bgs due to the excavation shoring and sloping constraints relative to the locations of the railroad tracks, the seawall, and the relieving platform.

Based on explorations previously completed in this area, the upper 9 feet of the soil to be excavated is generally expected to comprise noncontaminated overburden. Soil between 9 and 16 feet is expected to contain petroleum and immobile or mobile LNAPL. An estimated total of 6,500 in-place cubic yards of soil will be removed, comprising approximately 4,500 cubic yards of noncontaminated overburden and approximately 2,000 cubic yards of contaminated soil. Section 2.1.5 presents a more detailed description of the soil profile and volume estimates.

The excavated material is expected to be mixed fill that was placed between about 1905 and the late 1930s. The fill comprises primarily sand to silty sand with varying amounts of gravel, debris, and organic matter and remnants of the historical seawall along Elliott Bay (wood pilings). Historical development of the Offsite Area, including filling and seawall advancement, is further described in Section 2.1.4. The excavation is not expected to extend into native soil.

Excavated material will be segregated and stockpiled or loaded directly into trucks. Stockpiled noncontaminated overburden will be sampled to confirm that the concentrations of petroleum-related contaminants meet the criteria presented in Section 2.1.8. Section 2.1.11 presents the schedule and frequency for sampling stockpiled non-contaminated overburden. Noncontaminated overburden will be reused as excavation backfill, provided the material is suitable for geotechnical engineering purposes as described in Section 2.1.8. If the noncontaminated overburden material cannot be reused, it will be transported off site and will be reused or treated/disposed in accordance with Ecology's End Use Criteria for Petroleum-Contaminated Soil (Appendix B).

Contaminated soil with evidence of petroleum (e.g. petroleum staining, moderate or heavy water sheen, or headspace vapors greater than 1 percent of the lower explosive limit [LEL] as measured by a combustible gas meter) and/or immobile/mobile LNAPL will be temporarily stockpiled or loaded directly into trucks and transported to Waste Management's Alaska Street station / Columbia Ridge Landfill where it will be disposed in accordance with applicable regulations. Excavated contaminated soil transported off site will not likely be further sampled or tested. Overexcavation of soil beyond the area indicated or below a depth of approximately 16 feet bgs in Figure 1 is not planned.

The depth to groundwater in the Offsite Area hot spot location generally ranges from 9.5 to 11.0 feet bgs when Unocal's Trench D extraction wells are pumping. In the absence of pumping at Trench D, water levels in the hot spot area are slightly higher, in the range of less than a foot to about 1 foot higher, depending on location and seasonal fluctuations. Excavation dewatering is planned to enable removal of soil below the normal water table. Dewatering is further described in Section 2.1.7. Dewatering fluids will be processed through Unocal's existing treatment equipment and discharged to the King County sanitary sewer under Unocal's existing permit.

An engineered shoring wall will be used at the eastern excavation sidewall to allow removal of soil up to the alignment of approximately the existing fence line between the railroad tracks and Alaskan Way. Additionally, the shoring will mitigate the risk posed by excavating soil near the railroad. The shoring concept is further described in Section 2.1.6. The current seawall will be used as vertical retention for approximately a 75-foot long section of the western excavation boundary, contingent upon approval by the City of Seattle. The remaining excavation sidewalls will be sloped to prevent sidewall failure or sloughing. Excavation of the hot spot will necessitate either temporarily rerouting or temporarily decommissioning several underground utilities, as further described in Section 3.4.

Monitoring will be performed to document the results of the hot spot excavation. Section 2.1.11 describes the plan for confirmation monitoring of the Offsite Area. Soil samples will be obtained from the limits of excavation and from behind the shoring wall to document the concentrations of petroleum-related constituents in remaining soil.

Backfill, comprising suitable noncontaminated overburden and imported soil, will be placed from the base of excavation to existing grade or OSP subgrade, whichever is lower, at the completion of excavation. The shoring wall will remain in place after excavation. Section 3.10 describes the backfill plan in more detail.

ES-3.0 ORDER ON CONSENT AND AMENDMENT No. 4

Unocal has been conducting cleanup of the Former Seattle Marketing Terminal as required by Order on Consent DE88-N223 and Amendments 1 through 4. The original Order on Consent was signed by Unocal and Ecology in December 1988. In July 1995, Amendment No. 4 to the Order on Consent was signed by Unocal and Ecology. Amendment No. 4 contains cleanup targets and remedial action levels (RALs) for groundwater in the Offsite Area. The cleanup targets and RALs are included in Table 1.

Section 1.1 of this CAP Addendum presents a summary of the cleanup work performed in the Offsite Area to date as required by the Order on Consent. For context and completeness, the following lists the Amendment No. 4 requirements applied to the Offsite Area, and the status of each as of January 2005:

- Obtain additional assessment data from the Offsite Area during supplemental site characterization studies completed between the summer of 1995 and March 1996. These data are reported in GeoEngineers' Supplemental Site Characterization report dated June 28, 1996.
- Conduct a focused feasibility study (FFS) addressing technologies available for remediation of groundwater with contaminant concentrations greater than RALs. The FFS was submitted to Ecology in a document dated June 9, 1997.
- Complete a cleanup action plan (CAP) addressing the selected remedial technology for groundwater with contaminant concentrations greater than RALs. The CAP was submitted to Ecology on June 18, 1997.
- Continue to pump groundwater from Offsite Area recovery wells until the following conditions are met:

Amendment No. 4 Condition (Section H.4.IV.c)	Status as of January 2005
1. Free product recovery has diminished to less than five gallons per quarter for two successive quarters.	Criterion first in March 2003 and continues to be met.
2. Groundwater quality in at least eight of the nine Offsite Area points of compliance monitoring wells (MW-8, MW-10, MW-20, MW-25, MW-52, MW-67, MW-70, MW-71 and MW-72) complies with the remedial action levels (RALs) for four consecutive quarterly monitoring events.	This criterion not met. All wells meet this criterion except for MW-67 and MW-72. The remaining wells have been in compliance with RALs for at least the past ten consecutive monitoring events (see Table 2). MW-67 has had concentrations of cPAHs greater than the RALs for four of the last the last five consecutive cPAH sampling events. Sheen has been present in MW-72 for eight of the last ten monitoring events.
3. Groundwater quality in at least four of the five Lower Yard points of compliance monitoring wells complies with the Lower Yard remedial action levels (RALs) for four consecutive quarterly monitoring events.	Criterion met in July 2002 (all Lower Yard compliance monitoring wells were in compliance with RALs for nine consecutive quarterly events). The Lower Yard compliance wells have been decommissioned.

Subsequent to the development of Amendment No. 4, the following nine monitoring wells were designated by Ecology as proposed compliance monitoring wells for the Offsite Area: MW-8, MW-10, MW-20, MW-25, MW-52, MW-67, MW-70, MW-71 and MW-72.

Because only two of the above three criteria have been met as of January 2005, operation of the Trench D extraction system, as well as periodic removal of water and free product using a vacuum truck, are ongoing, as required under Amendment No. 4. The extraction system functions to reduce or eliminate the risk of contaminants migrating into Elliott Bay. Final confirmation compliance monitoring of Offsite Area groundwater will be initiated following termination of the Offsite Area extraction system. Amendment No. 4 notes that the final determination of nine wells listed above as cleanup confirmation compliance wells is subject to Ecology review of well construction information and the compliance monitoring plan.

The remaining conditions for the Offsite Area in Amendment No. 4 relate to activities that occur after termination of active recovery in the Offsite Area extraction system. These requirements are:

- Implement passive (non-pumping) free product recovery if quarterly monitoring events after the date of termination of active free product recovery indicate more than 0.1 foot of free product in any five or more Offsite Area monitoring and/or recovery wells.
- Continue quarterly groundwater monitoring of Offsite Area compliance monitoring wells until the following conditions are met:
 - Active free product recovery has not been necessary for at least eight consecutive quarterly monitoring events.
 - Groundwater in at least eight of the nine Offsite Area compliance monitoring wells is in compliance with Offsite Area groundwater RALs for eight consecutive quarters.
 - Groundwater in at least four of the five Lower Yard compliance monitoring wells is in compliance with Lower Yard groundwater RALs for eight consecutive quarters.