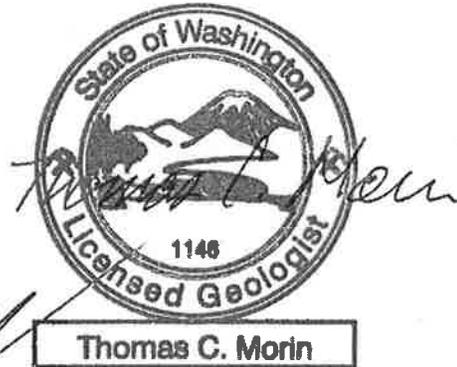


**TECHNICAL MEMORANDUM**

**DATE:** July 28, 2014  
**TO:** Mr. Ted Sykes  
Earth Solutions NW, LLC  
**CC:** Mr. Joe Zlab  
Potala Village Kirkland, LLC  
**FROM:** Mr. Eric Caddey, LG  
Environmental Partners, Inc.



Mr. Thom Morin, LG  
Environmental Partners, Inc.

**RE:** Response to Ecology's Request for Tier 1 Soil Vapor Intrusion Study  
Potala Village Kirkland, LLC

EPI Project Number: 48111.0

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At Earth Solutions NW, LLC's (ESNW's) request, Environmental Partners, Inc. (EPI), reviewed the Department of Ecology's (Ecology) Opinion Letter dated May 29, 2014, regarding the remedial actions conducted at property being redeveloped by Potala Village Kirkland, LLC (Potala) located at 1006 Lake Street South (Parcel A), 6700 Lake Washington Boulevard Northeast (Parcel B), and 21 – 10<sup>th</sup> Avenue South (Parcel C) in Kirkland, Washington (collectively, the Property). Potala has plans to construct a five-story mixed-use structure on the Property with one level of below-grade parking, commercial spaces on the ground floor, and residential units on the three floors above the commercial spaces (the Proposed Building). The Property is enrolled in the Voluntary Cleanup Program (VCP) and is assigned VCP Project No. NW2850.

An ARCO service station with associated underground storage tanks (USTs) formerly operated on Parcel B. In April 2014, ESNW and EPI conducted interim remedial actions at the Property that included excavation and removal from the Property of all soils impacted with petroleum hydrocarbons attributable to the former ARCO service station. All soils containing petroleum hydrocarbons in concentrations greater than the default (Method A) cleanup levels established by the Model Toxics Control Act (MTCA) were removed from the Property. However, soil containing gasoline-range total petroleum hydrocarbons (GRO) at concentrations greater than the applicable Method A cleanup level were left in place below the sidewalk on the City of Kirkland right-of-way to the west of Parcel B.

The GRO-impacted soil beyond the western boundary of the Property was segregated from the Property by installation of an impermeable barrier. The barrier consists of a high-density polyethylene (HDPE) curtain membrane with a geosynthetic bentonite clay lining. The barrier was installed along the segment of the western boundary of the Property where the impacted soil is present and extends vertically from the ground surface to below the depth of the impacted soil. The barrier is represented in

Figure 1. The barrier serves as an impermeable physical barrier to the lateral migration of GRO to the Property, either through sloughing, leaching to groundwater, or vapors.

ESNW asked EPI to provide a response to the third bullet on Page 5 of Ecology's opinion letter, which states:

"Soil at the Property boundary containing TPH-G up to at least 1,800 mg/kg may pose a vapor intrusion threat to the planned building. At a minimum, a Tier 1 evaluation should be performed in accordance with Ecology's *Draft Guidance for Evaluating Soil Vapor Intrusion in Washington State: Investigation and Remedial Action* dated October 2009."

While EPI agrees that the residual GRO impacts beyond the western boundary of the Property have the potential to generate vapors, it disagrees that a Tier I assessment is necessary because mitigation measures have been successfully installed at the boundary of the Property that prevent the lateral migration of vapors. Because the barrier is already in place to deal with the potential threat of vapor intrusion, a Tier 1 assessment is unwarranted and would serve no purpose. Furthermore:

1. There are no ground floor residential uses at the Property within 100 feet of the residual off-property GRO impacted soils.
2. Absent a preferential pathway, vapors migrate vertically in soil rather than laterally. The impermeable barrier removed any preferential pathways for vapors from the impacted soils to the Proposed Building. Due to the barrier, vapors that might emanate from the GRO-impacted soils cannot migrate laterally toward the Proposed Building;
3. The impermeable barrier is designed to prevent lateral migration of groundwater and vapors. To pose a vapor intrusion threat, the vapors would have to migrate through and past the impermeable barrier laterally at least 30 feet to the east to the parking garage that will be constructed as part of the Proposed Building (see attached Figure 2); and
4. If a Tier I assessment were to be performed, soil gas samples would necessarily have to be collected above the residual GRO impacts, which are located off-property beneath a sidewalk in the public right-of-way and segregated from the Property by the impermeable barrier. The results of such soil gas samples would have no correlation to the potential intrusion of vapors under or into the Proposed Building.

For the reasons stated above, a Tier 1 assessment is unwarranted.

## ENCLOSURES

### Figures

Figure 1 Depiction of Impermeable Barrier

Figure 2 East-West Cross-Section