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6 August 2015

Mr. Stephen Posner
Energy Facility Site Evaluation Council
Washington Utilities and Transportation Commission
P.O. Box 43172
Olympia, WA 98504-3172

Subject: Vancouver Energy
EFSEC Application No. 2013-01, Docket No. EF131590
Response to EFSEC Draft EIS Data Request Regarding Seismic Design of Area 300 Secondary Containment Berm

Dear Mr. Posner:

On behalf of Tesoro Savage Petroleum Terminal LLC (the Applicant), BergerABAM is providing a response to the Energy Facility Site Evaluation Council's (EFSEC) Draft EIS Data Request following up on the storage area secondary containment berm, e-mail dated 5 August 2015. The questions posed and the Applicant's response are provided below.

1. What is the slope of the proposed 6-ft high berm?

   The inside slope of the berm is anticipated to be approximately 2:1. See Figure 2.3-10 of the Application for Site Certification Supplement (ASC Supplement) (Jan 2014) and Figure 4 (page A-12) of the Operations Spill Prevention Control and Countermeasures Plan (June 2015), attached to this response letter for your convenience.

2. How will the berm be constructed?

   The construction of the berm is addressed in Section 2.3.1.3 of the PDEIS:

   "Following site grading and subsurface preparation, AST tank foundations would be poured. Sand and gravel material would be laid throughout the storage tank area, and the surrounding berm constructed. The berm around the storage tank area would be constructed from materials excavated from the loading area during the construction of the piping trench, general grading of the storage tank area, and imported from off-site sources. Materials excavated from areas with potential contamination would be tested; if they are deemed contaminated, they would be disposed of in accordance with Port

management procedures and replaced with clean fill for berm construction. The impervious membrane liner would then be placed covering the berm and storage area, and would either be tied into the AST foundations or would cover the entire containment area."

Soils excavated from the construction of storage tank foundations could also be used.

3. What soil types will be used in the construction?

   See response to Item 2 above. Soil types used for berm construction would be identified and selected in accordance with sound engineering practice. Also see response to Item 4 below.

4. Has a seismic stability analysis of the berm been conducted for the 2475-yr MCE peak ground acceleration (PGA) without the contained oil present?

   A seismic stability analysis has not yet been conducted. The Applicant will design the berm and its liner to code requirements to address the seismic risk identified in EFSEC's forthcoming Draft Environmental Impact Statement.

   As noted in Table 2.10-1 of the ASC Supplement, the berm will be designed in accordance with the requirements of WAC 173-180-320. WAC 173-180-320 (9)(c) specifically states "Secondary containment systems must be designed to withstand seismic forces," and sub (e) that "Secondary containment systems must be designed and constructed in accordance with sound engineering practice and in conformance with the provisions of this section."

5. Has the stability analysis considered (i) the liquefaction-induced total and differential settlements likely to occur beneath the berm during the ground shaking, and (ii) the effect these settlements may have on the integrity of the berm?

   Please see response to Item 4 above.

6. Has a seismic stability analysis of the berm been conducted for an aftershock with the contained oil and rain water present? The height of the 418,000 barrels oil (2,341,000 ft3) contained by the berm would be ~4 ft, assuming the available area (~584,000 ft2) was the space within the perimeter of the berm (~810,000 ft2) minus the area of five tanks (~226,000 ft2) that did not rupture. This fluid volume will generate both static and hydrodynamic forces on the berm during an aftershock.

   Please see response to Item 4 above.

7. If stability/integrity of the berm cannot be demonstrated from the effects of ground shaking and attendant permanent ground deformation, will flexible impermeable liners be inserted to mitigate the possibility of oil penetrating through the berm, assuming 418,000 barrels of oil are released from the Maximum Considered Earthquake (MCE) during the 100-yr storm? (Note that the assumption is that the full volume of spilled oil will not be present during the MCE main shock, because it is unlikely to leak fast enough from the ruptured tank during the several minutes of shaking, but will be present during an aftershock that follows shortly thereafter).

   See Item 4 above. As indicated in the PDEIS, Section 2.2.2.9, an impervious membrane will be used to line the berm. This impervious membrane would be flexible.

8. Is the contained spill volume to include both the oil and rainwater? If so, how many inches of rain should be added to the top of the oil?

   Yes, the capacity of the secondary containment berm will be sized to contain rainwater – from a 24-hour, 100-year event. Please refer to the Applicant's recently submitted response regarding berm containment capacity (dated 27 July 2015), which states the following.

   "The Area 300 secondary containment area would have a capacity at least equal to 110 percent of the *API 650 maximum capacity of the largest tank,* plus precipitation from a 24-hour, 100-year storm event."

   Section 1.4.7 of the National Pollutant Discharge Elimination System Engineering Permit Engineering Report (submitted to EFSEC in April 2014 and resubmitted in February 2015) identifies the design storm rainfall intensity as 4.3 inches for the 100-year, 24-hour storm.

Please feel free to contact me at 206/431-2373, or at irina.makarow@abam.com, if you have any questions about this submittal. We look forward to further coordination with you, your staff, and EFSEC's consultants.

Sincerely,

Irina Makarow
Senior Environmental Project Manager

IM:dls

cc: Kelly Flint, Savage Companies
Jay Derr, Van Ness Feldman

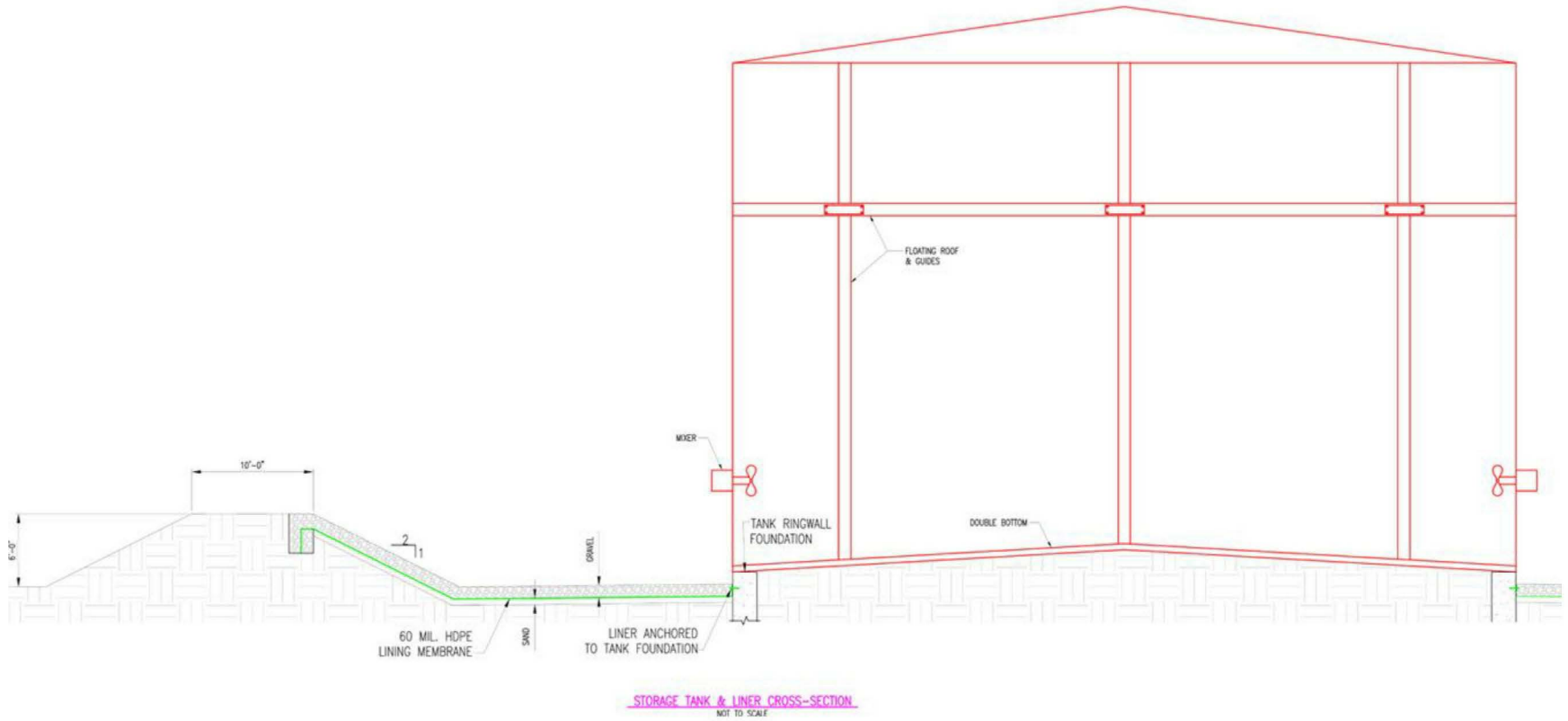

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Figure 2.3-10. Containment Berm Cross Section

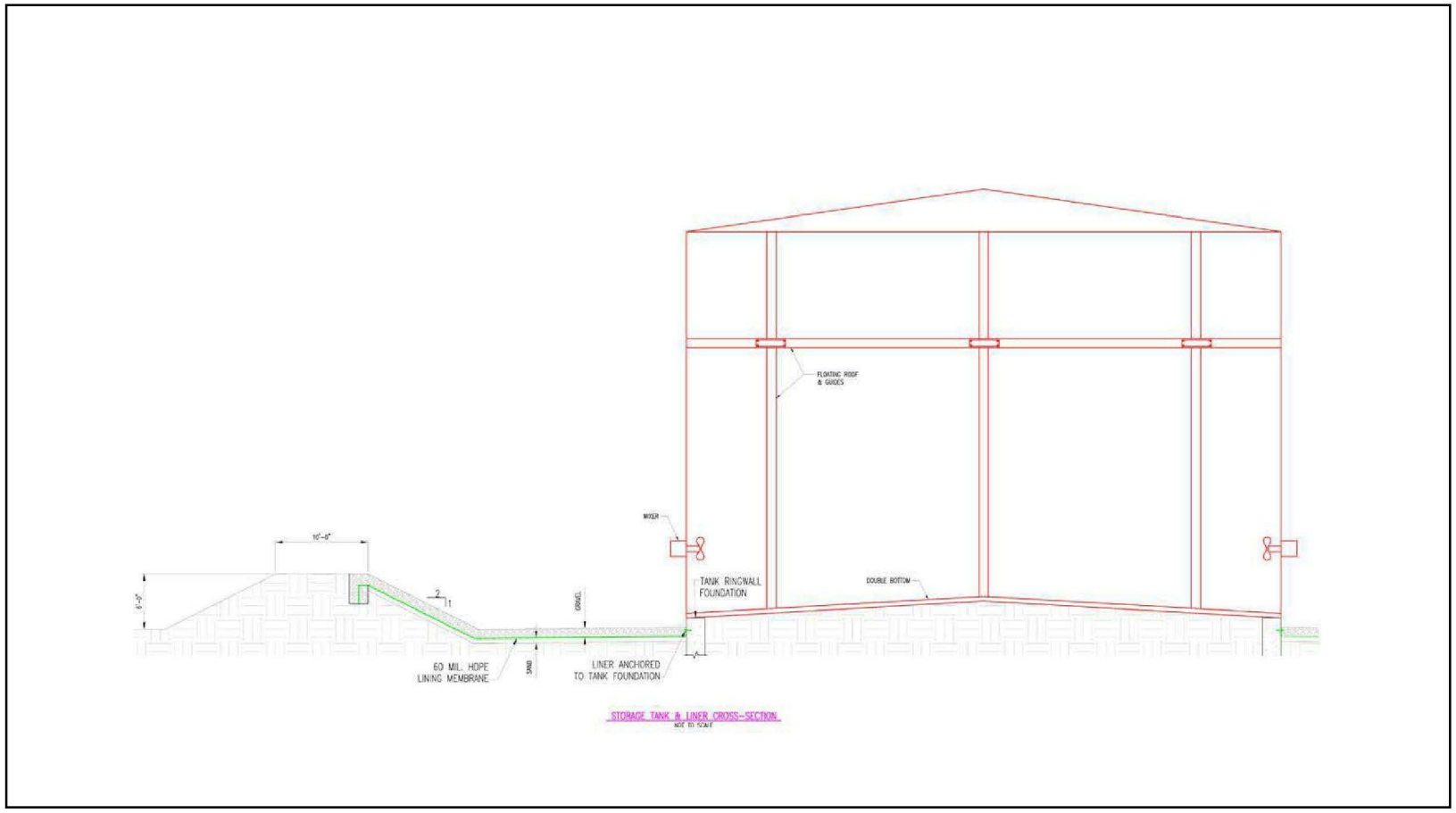

Figure 4 – Containment Berm