Nowell, Keith, Env. Health

To: 'Jeff Rubin'
Cc: jjones@portoakland.com; Katherine.Brandt@arcadis-us.com; Roe, Dilan, Env. Health
Subject: FW: Fuel Leak Cases RO0000010-Port of Oakland- and RO0000187- Port of Oakland/ Nations Way Transport, both addressed as 651 Maritime Street, Oakland

Dear Mr. Rubin,

Thank you for responding to Alameda County Environmental Health's (ACEH) request to address data gaps identified in the meeting held on December 19, 2013 at our offices for fuel leak cases Port of Oakland (Port) and Port of Oakland/ Nations Way Transport, 651 Maritime Street, Oakland, ACEH case numbers RO0000010 and RO0000187 (collectively referred to as the Site) and for providing ACEH a copy of the Port of Oakland Health and Safety Plan. ACEH staff has reviewed the case file, including the *Response to ACEH Information Request* (IR) dated January 31, 2014, and the *Low-Threat Closure Policy Summary* (PS-RFC) dated October 7, 2013. Both reports were prepared by ARCADIS for the subject Site. As discussed in the meeting, ACEH did not concur with the PS-RFC closure request and the analysis supporting free product plume stability, vapor intrusion risk, explosive hazard risk, and risk associated with imported fill. The IR document addresses the information requested by ACEH.

Following the ACEH review of the IR document and the case file, ACEH does not concur with the closure request substantially due to the demonstrated methane generation associated with free product plume biodegradation and the resultant explosive hazard. It is the opinion of ACEH that we cannot determine if the free product plume boundary is stable as the product is demonstrating mobility. Due the plume being surrounded by monitoring wells having submerged well screens 100-percent of the time, a determination if the free product plume is migrating cannot be made. Additionally, the plume may be migrating northward off-Site as demonstrated with the more than one-foot of free product present in well MW-8, which had been located along the northern property boundary before being destroyed for Site redevelopment.

Presented below are the questions ACEH posed following the December 19, 2013 meeting, the Port responses to the ACEH-posed requests for information, and ACEH comments to the information provided.

1. ACEH Initial Comment: Timeline addressing building demolition (including lead and asbestos survey findings), fill placement (fill source and analytical data), on-site building construction, and proposed off-site redevelopment.

   Port Response: The Port provided a time line of Site redevelopment, information pertaining to lead and asbestos surveys, estimates of fill quantities and fill source, cross section depicting the thickness of fill across the Site, and soil gas mitigation as-built drawings. The Site history includes the 2006 grading operation involving the import of an estimated 110,000 cubic yards of material used to raise grade by up to approximately three feet. The Port identified a potential remaining data gap as the exact volume of fill material placed on the Site.

   ACEH Follow-up Comment: The Port has adequately addressed the time line of Site redevelopment, information pertaining to lead and asbestos surveys, estimates of fill quantities and fill source, and on-Site building construction for the building provided. ACEH notes that no laboratory analysis of the import fill was conducted resulting in a data gap for potential direct contact and vapor intrusion to indoor air pathway scenarios of the State Water Resources Control Board's (SWRCBs) Low Threat Underground Storage Tank Case Closure Policy (LTCP) media specific criteria. Additionally, future on- or off-site redevelopment was not addressed by the IR. However, ACEH is of the opinion residual contaminants in soil can be managed with a soil management plan (SMP).

   Action Item: No further information required.

2. ACEH Initial Comment: Documentation of the soil-gas vapor intrusion system including methane sensor installation and system performance (if applicable).

   Port Response: The Port provided as-built diagrams for building construction showing a vapor barrier and a soil vapor passive mitigation system for the structure addressed as 651 Maritime Street. Also provided were methane gas monitoring data for the passive mitigation system. The Port identified a potential remaining data gap as annual methane monitoring results for the period 2006 to 2008 were not located.

   ACEH Follow-up Comment: The Port has adequately addressed the soil-gas vapor intrusion system, methane sensor, and system performance for the 651 Maritime Street building. ACEH does not perceive the lack of 2006

to 2008 methane monitoring results as a significant data gap. However, it is unclear to ACEH that this is the only structure at the Site and considers this to be a data gap.

Action Item: Identify all on-site structures and if the structure(s) are slab-on-grade or have raised foundation systems and if they have active or passive soil gas mitigation systems and provide as an updated site conceptual model in the document requested below.

3. ACEH Initial Comment: A list of monitoring and remediation wells and former wells at the Site. Include well construction details, well status, and a well screen evaluation.

   Port Response: The Port provided a table presenting well construction details, stating all available bore logs are provided in Attachment 5, and noting that site grading activities raised the ground surface elevation from between 0.5-foot and 3 feet. The Port identified two potential remaining data gaps: the top of casing (TOC) elevation data for wells RW-1 through RW-9 prior to site re-development are not available and the bore log for monitoring well MW-6 could not be located.

   ACEH Follow-up Comment: ACEH does not consider the lack of availability of the TOC elevation data for wells RW-1 through RW-9 prior to Site re-development as a significant data gap. ACEH agrees with the Port that the lack of a bore log for monitoring well MW-6 is a data gap. ACEH notes that the well construction data table does not include columns presenting post-grading depths to TOC or bottom of the screened interval; and that the provided bore logs are only for the monitoring and remediation wells and does not include non-well boring logs for Site soil and groundwater investigations.

   Action Item: Update and resubmit table in an updated site conceptual model as part of the document requested below.

4. ACEH Initial Comment: A narrative of well identification nomenclature as the duplicate well identification numbers from the adjoining Port of Oakland (RO0000010) and Port of Oakland/ Nation Ways Transport (RO0000187) were combined into one case file.

   Port Response: The Port provided well identification (ID) descriptions for the duplicate wells. The Port did not identify data gaps for this item.

   ACEH Follow-up Comment: ACEH considers the Port response as adequate for the duplicate well descriptions.

   Action Item: No additional action required.

5. ACEH Initial Comment: A cumulative table presenting groundwater monitoring data, including depth-to-water, laboratory analysis, presence/absence of free product, and well screen submergence.

   Port Response: The Port provided Attachments that provide tables summarizing groundwater monitoring data, including depth-to-water, laboratory analysis, presence/absence of free product, and well screen submergence. The Port identified one potential remaining data gap- as the data for TOC elevation data for wells RW-1 through RW-9 prior to site re-development are not available, the frequency of well submergence was not calculated for these wells.

   ACEH Follow-up Comment: ACEH does not consider the submergence frequency calculations for wells RW-1 through RW-9 as a significant data gap and is of the opinion that the Port has adequately addressed the depth-to-water and laboratory groundwater monitoring data for other Site monitoring wells. However, the post-grading submergence for the RW wells are not adequately addressed as Table 2 does not indicate if the well screens were- or were not submerged. Further, it is the position of ACEH that the presence/absence of free product has not been adequately addressed as not all data located in the file has been included in the table.

   Action Item: Update and resubmit table in an updated site conceptual model as part of the document requested below.

6. ACEH Initial Comment: An analysis of the varying groundwater flow directions reported at the Site and a rose diagram.

Port Response: It is the Port's opinion that the predominant groundwater flow direction is to the north/northwest. In lieu of a rose diagram, the Port provided Attachment 9 (a figure) depicting stick figure arrows for the groundwater flow directions calculated for the Site. Data gaps identified by the Port were: groundwater flow information was not located for the three semiannual monitoring events (second quarter 1995, second quarter 2000, and fourth quarter 2002), and the lack of preparation of the rose diagram.

ACEH Follow-up Comment: ACEH considers the Port response inadequate. ACEH's review of the groundwater data suggests more flow directions contrary to the prominent flow determined by the Ports review exist than are depicted on Attachment 9. No discussion of Site hydrogeology is presented and the interpreted predominant north/northwest flow direction does not appear to be consistent with Site geology.

Action Item: Provide a discussion of Site hydrogeology, update the figure, and resubmit in an updated site conceptual model as part of the document requested below.

7. ACEH Initial Comment: A summary of the history of free product removal at the Site, including cumulative product removal tables.

   Port Response: The Port provided free product removal and cumulative product removal tables and provided a summary of the history of product removal at the Site. The summary stated from April 29, 2004 to June 7, 2011 a free product removal system which consisted of 6 skimmer pumps in 9 recovery wells and 500-gallon above ground storage Convault was operated onsite. From December 2004 to July 2007 approximately 178 gallons of product were removed. Between January 2007 and June 2011, free product was removed from MW-3 using a peristaltic pump and polyethylene tubing as part of the weekly system O&M activities. In July 2007 the system was upgraded to include a blower to apply a low vacuum in order to improve product recovery. From August 2007 to June 2011 approximately 1,298 gallons of product were removed. In total, approximately 1,746 gallons of product have been removed by the free product recovery system. The system was shutdown on June 7, 2011 in accordance with a recommendation by the Port in the site Feasibility Study/ Corrective Action Plan dated March 15, 2011. The Port did not identify data gaps for this item.

   ACEH Follow-up Comment: ACEH considers the Port response as adequate for the summary of the history of free product removal at the Site, including the cumulative product removal tables.

   Action Item: ACEH notes that the March 2011 Feasibility Study/ Corrective Action Plan, and the Feasibility Study/ Corrective Action Plan Addendum, dated December 30, 2011, were not approved by this agency and, based on free product rebound in the remediation wells (increase in free product thickness of up to 7.66 feet in RW-7 since remedial system shut down), methods for free product abatement should be reevaluated in a Revised Feasibility Study/ Corrective Action Plan Addendum.

8. ACEH Initial Comment: An assessment of dissolved metals concentrations.

   Port Response: The Port reported analytical data for dissolved metals in groundwater could not be found, other than for organic lead. The data gap identified by the Port is the lack of dissolved metals concentration data for groundwater.

   ACEH Follow-up Comment: ACEH considers the Port response as adequate for the assessment of dissolved metals concentrations and agrees with the Port this is a data gap. However, based on the distance to potential receptors, ACEH is of the opinion residual dissolved metals concentrations can be managed with a SMP.

   Action Item: Manage residual contamination in accordance with the SMP.

9. ACEH Initial Comment: Verification of the adequacy of Risk Assessment against current standards (including model version and inputs and outputs).

   Port Response: The Port states that although the methods used to estimate excess lifetime cancer risks (ELCRs) due to potential onsite commercial worker inhalation of volatile COPCs have changed since IRIS Consultants conducted the Human Health Risk Assessment (HHRA) in 2003 for the Port of Oakland and estimated ELCRs are likely higher (but still within the acceptable 1E-6 to 1E-4 ELCR target range), there are several factors which would offset newly derived ELCRs. First, soil vapor data were collected approximately eleven years ago. Since that time, soil vapor concentrations of volatile COPCs have very likely decreased given natural attenuation and the fact that there is not a continuing source. Second, when the site was graded and redeveloped, fill material was brought in; yielding an increased separation distance from residual subsurface impacts of approximately 2.5 feet (based on calculations described in Item 1). It is the Port's position that predicted indoor air concentrations of

volatile COPCs are expected to be lower than those estimated without additional fill material. Third, the site is entirely paved with asphalt/concrete and a vapor barrier with an effective passive soil gas removal system (as described, above) was installed beneath the onsite building; resulting further decreased likelihood of vapor migration into the building. The Port did not identify data gaps for this item.

ACEH Follow-up Comment: ACEH agrees with the Port that the soil vapor concentrations of volatile COPCs have very likely decreased since the collection of soil gas samples 11 years ago; however, ACEH considers the Port response as inadequate for the verification of the adequacy of the risk assessment. No analytical analysis of the import fill has been conducted and cannot be evaluated against the LTCP media specific direct contact or vapor intrusion criteria or other appropriate screening levels specific to non-petroleum related contaminants. As mentioned in Item 1 above, lack of analytical data for the import fill is considered by ACEH as a data gap. Additionally, the effect of the fill either as a mitigator or contributor to the migration of soil vapor cannot be evaluated. However, based on the Site being either paved or covered by structures and the vapor barrier and soil gas venting system, ACEH is of the opinion residual contaminants in soil can be managed with a SMP.

Action Item: Manage residual contamination in accordance with the SMP.

10. ACEH Initial Comment: Sub-slab and vent soil gas data (if available).

    Port Response: The Port has provided soil gas sample port data for the building at 651 Maritime Street in Table 3 and presented in Table 10 soil gas data collected from 23 on-Site locations performed in 2002. The soil gas samples were recovered at four feet below the existing ground surface. The Port identified two remaining data gaps- the lack of sub-slab soil gas data and vent soil gas data following Site redevelopment activities.

    ACEH Follow-up Comment: It is unclear to ACEH that the 651 Maritime Street building is the only structure at the Site and considers this to be a data gap. It is the opinion of ACEH that the lack of sub-slab soil gas monitoring data may be a significant data gap as the data would provide useful as part of an explosive hazard evaluation for other structures situated over the petroleum product plume. ACEH recommends evaluating nearby structures for soil gas/ vapor mitigation systems as well as the type of foundation system used.

    Action Item: Identify all on-site structures and off-site structures within 500 feet of the Site. Determine the foundation type for the structures (e.g. slab-on-grade or raised foundation system) and if they have active or passive soil gas mitigation systems. Provide this information in an updated site conceptual model as part of the document requested below.

11. ACEH Initial Comment: Figures using an aerial photograph base showing boring and well locations and an overlay with former building, current buildings, and former tank locations.

    Port Response: The Port has provided a figure using a photograph base showing boring and well locations and an overlay with former building, current buildings, and former tank locations. The Port did not identify data gaps for this item.

    ACEH Follow-up Comment: It is the opinion of ACEH that not all soil boring locations conducted at the Site are depicted on the figure and therefore presents a data gap.

    Action Item: Update figure and resubmit in an updated site conceptual model as part of the document requested below.

Therefore at this juncture, please prepare a Revised Feasibility Study/ Corrective Action Plan Addendum (FS/CAP) and address the action items discussed above in a focused site conceptual model to be provided as part of the FS/CAP. Please note that due to the explosive hazard presented by methane generation associated with the free product plume, ACEH does not consider monitored natural attenuation and soil gas venting as viable alternatives to free product removal. Additionally please provide a figure using an aerial photograph base showing current on-site buildings and nearby adjacent structures.

Technical Report Request

Please upload technical reports to the ACEH ftp site (Attention: Keith Nowell), and to the State Water Resources Control Board's Geotracker website, in accordance with the following specified file naming convention and schedule:

- **May 27, 2014 – Revised Feasibility Study/ Corrective Action Plan Addendum** (file name: RO0000010_FEASSTUD_CAP_L_yyyy-mm-dd)

Thank you for your cooperation. ACEH looks forward to working with you and your consultants to advance the case toward closure. Should you have any questions regarding this correspondence or your case, please call me at (510) 567-6764 or send an electronic mail message at keith.nowell@acgov.org.

Respectfully,
Keith Nowell

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PDF copies of case files can be reviewed/downloaded at:

http://www.acgov.org/aceh/lop/ust.htm