PORT OF OAKLAND

February 7, 2008

Mr. Steven Plunkett
Hazardous Materials Specialist
Alameda County Environmental Health
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

Subject: **Response to Comments**
Fuel Leak Case RO #0000019 (Global ID #T0600101102), Port of Oakland, 801 Maritime Street, Oakland, California

Dear Mr. Plunkett:

Pursuant to your e-mail of January 24, 2008, to Port of Oakland ("Port") consultant Masood Ghassemi of R&M Environmental and Infrastructure, Engineering, Inc. ("R&M"), this is a written response to your directive letter of December 13, 2007 regarding the former underground storage tank site at 801 Maritime Street, Oakland, California. I received the December 13th directive letter following my earlier submission to the Alameda County ("County") on October 23, 2007 of a report of "*Additional Site Investigation at 801 maritime Street, Underground Storage Tank Site, Port of Oakland, Oakland, California, Fuel Leak Case RO0000019*", dated August 27, 2007. The October 23rd report was submitted to the County prior to the construction of the two additional monitoring wells due to the County's earlier request to review the field data collected; essentially the August 27th submission was an interim report of findings. The County's December 13th communiqué included five sets of technical comments which are repeated below in italics. The Port's responses follow each numbered comment.

1. COUNTY'S COMMENT: ***Source Area Characterization.*** *Currently, the vertical extent of contamination in the source area is undefined. Residual contamination beneath the former USTs was detected at 9.5 feet bgs, which was the maximum depth of the excavation. The purpose of contaminant source characterization is to determine the nature and extent of petroleum impacted soils (residual phase), and hydrocarbons dissolved in groundwater (aqueous phase). Please provide your proposal for source area*

characterization in the work plan requested below. Report the results of your work in the Soil and Water Investigation Report requested below.

PORT'S RESPONSE: The Port considers the source area to be the location of the original underground storage tanks including a block of soils surrounding the tanks that was previously excavated as a Removal Action. The source area was not a target of the additional exploration work because it was not within the original scope of work outlined in the workplan. The County previously reviewed and commented on the workplan and did not ask for additional exploration in the source area. Also, see our response to comment #3, below.

2. COUNTY'S COMMENT: ***Soil Borings RM-1 through RM-10.*** *The investigation completed in August 2007 collected soil and groundwater data to a maximum depth of 11 feet bgs. Groundwater elevation fluctuation could have resulted in the distribution of contamination in soil below the water table, resulting in soil contamination below the maximum depth explored during the investigation. Additional soil sampling below 11 feet is essential to determine the vertical distribution of residual contamination in soil. Please propose additional soil boring locations immediately downgradient of the source area in the work plan requested below.*

PORT'S RESPONSE: Due to the proximity of San Francisco Bay, it is unlikely that groundwater levels in this area could fluctuate to the extent postulated. Past water elevation data collected at MW-1 from July 1996 to September 2007 has indicated a fluctuation from a low of 6.09 feet Port Datum (or 2.89 feet MSL) to a high of 6.66 feet Port Datum (or 3.46 feet MSL). These elevation extremes correspond, respectively, to a depth in MW-1 from 7.46 feet to 7.52 feet below the top of casing and well within the depth range explored by R&M. Accordingly, the Port believes that additional soil sampling below 11 feet is not warranted.

3. COUNTY'S COMMENT: ***Soil Sampling and Analysis.*** *ACEH requests soil samples be collected from soil borings at changes in lithology, areas of obvious hydrocarbon contamination or when elevated PID readings occurs. If no changes in lithology, obvious contamination or elevated PID readings*

occur, soil samples shall be collected at the capillary fringe and approximately 5-foot intervals until the total depth of 25 feet bgs has been reached. Soil samples collected below 20 feet should be placed on laboratory hold pending results from the overlying sample. All soil samples are to be submitted for the following analysis: TPHg, TPHd, BTEX and MTBE. Please present results from soil sampling in the Soil and Groundwater Investigation Report requested below.

PORT'S RESPONSE: The Port followed a workplan previously approved by the County for the exploration activities just completed and this plan included limiting the depth extent of the investigation activities to a maximum of 11 feet bgs. The choice of the limited depth was based on prior knowledge of the local soils, particularly the presence of a naturally occurring fine-grained sediment layer that occurs on site starting at 15 feet bgs. The Port is reluctant to deeply penetrate beyond 15 feet bgs due to concerns about creating a unintentioned preferential pathway allowing petroleum hydrocarbons to contaminate or spread downward.

The boring log for the onsite well, MW-1, is attached because it depicts the shallow stratigraphy at the site. Fill material is noted for the first 15 feet bgs. The sands and silts described were placed hydraulically in the 1930s as part of the Western Waterfront Development. Immediately below the sandy fill, the original Bay sediment is encountered which extends to the maximum depth explored at 20 feet bgs. The sediment or mud is informally called the Young Bay Mud and is found underneath Berth 24 and the adjacent berths in the Marine Terminals. The Young Bay Mud is also considered a barrier to deep penetration of petroleum hydrocarbons from the 801 Maritime site. Accordingly, the Port believes it is unnecessary to sample groundwater below the Young Bay Mud.

4. COUNTY'S COMMENT: ***Groundwater Sampling and Analysis.*** *The water samples are to be analyzed for TPHg and THPd by EPA Method 8015M or 8260, BTEX, EDB, EDC, MTBE, TAME, ETBE, DIPE, TBA and EtOH by EPA Method 8260. Please present the results from groundwater sampling in the Soil and Groundwater Investigation Report requested below.*

PORT'S RESPONSE: The Port followed a pre-approved workplan that included TPHg, TPHd, and BTEX by EPA Method 8015/8020 and did not include analysis for all the fuel oxygenates. The full fuel oxygenates analyte suite was not considered because the tank site was active and later closed prior to the wide-spread use of these compounds. Accordingly, the Port believes that the prior suite of analytical tests conducted at this site was sufficient.

5. *COUNTY'S COMMENT*: ***Hydrogeologic Cross Sections.*** *Please incorporate historical soil borings and monitoring well data including soil and groundwater analytical data, static water level and first water encountered, well screen interval, distinct geologic contacts and the location of former UST tank pit and appurtenances into a minimum of two cross sections that are parallel and perpendicular to groundwater flow. Please present the cross sections in the Soil and Groundwater Investigation Report requested below.*

PORT'S RESPONSE: Noted.

In the Port's original work plan (dated February 26, 2007); the Port proposed to install two additional monitoring wells. However, results from an additional site characterization effort in March 2007, whereby borings were advanced at 10 locations and soil and grab groundwater samples were collected and analyzed, indicated only minor petroleum hydrocarbon impacts on soil and groundwater with the impact appearing to be localized at or near one boring (Boring RM-5; see data in Table 1, attached). Benzene, a constituent of significant environmental concern, was not detected in any of the soil and groundwater samples. As shown in Table 1, the highest concentrations of key contaminants of concern (BTEX, TPH-g, and TPH-d) in soil and groundwater samples were significantly lower than the environmental screening levels developed by the California Regional Water Quality Control Board, San Francisco Bay Region, for "Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater".

Results for groundwater monitoring that have been performed at the sole existing on-site monitoring well since 1996 are summarized in Table 2. The

data for the latest (12th) round of monitoring, performed on September 28, 2007, indicate TPH-g and TPH-d concentrations of 76 µg/L and 4,000 µg/L, respectively, low levels of BTEX, and a non-detect level of MTBE. These results are consistent with the data from the previous groundwater monitoring event conducted on April 12, 2007, with both sets of data indicating lower levels of TPH-g and BTEX in comparison with those reported for the 1996-2002 monitoring events. The reported TPH-d values, however, have fluctuated widely over the past 11 years of monitoring, with values ranging from non-detect to 7,100 µg/L.

Based on the above considerations, the Port does not believe that sampling of the soil beyond a depth of 11 ft would be warranted. Instead, the Port would like to propose for the County's consideration the following options that would generate additional data that can enhance the adequacy of the current database for site assessment or formulation of further actions, including consideration of the site for low-risk site closure:

Option 1 – Advancing 4 additional borings near the location of previous Boring RM-5 and collecting and analyzing soil and grab groundwater samples to delineate the boundary of residual contamination noted at RM-5;

Option 2 – Installing the two additional monitoring wells as originally proposed and performing 4 quarters of groundwater monitoring at these wells and the one existing well; or

Option 3 – Combining Options 1 and 2 (i.e., advancing borings to collect soil and grab groundwater samples and, installing and monitoring two additional monitoring wells).

Please advise if you concur with the Port's proposed rationale and the County's preference among the three proposed options. Once the course of follow up action has been chosen, the Port will prepare and submit to you a work plan for implementation of the selected approach. Please feel free to contact me either by telephone 510-627-1373 or by email at

jprall@portoakland.com if you want to discus the matter further. We will be glad to meet with ACEH staff to discuss our proposal.

I declare under penalty of perjury, that the information and/or recommendations contained in this letter, report, and attachments are true and correct to the best of my knowledge.

Sincerely,

John Prall, P.G.
Port Associate Environmental Scientist

CC: Masood Ghassemi, R&M Environmental
Jeff Jones, Port of Oakland
Michele Heffes, Port of Oakland
Deborah Ballati, Farella Braun + Martel
Philip King, Meckler Bulger & Tilson

Attachments:

- Boring Log for MW-1
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- Table 1: Comparison of the highest levels of contaminants found in soil and grab groundwater samples from the site with Environmental Screening Levels (ESL)
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- Table 2: Groundwater Monitoring Results for MW-1

TABLE 1: Comparison of the highest levels of contaminants found in soil and grab-groundwater samples from the site with Environmental Screening Levels (ESLs)

Chemical Parameter	SOIL		WATER		
	Highest Conc. In Site Soil (Boring RM-5-5) mg/kg) (1)	ESL for Shallow Soils (≤3m bgs) (mg/kg) (2)	Highest Conc. In Site Groundwater (Boring RM-5) (µg/L) (1)	Groundwater Screening Level (µg/L) (3)	Surface Water Screening Levels/Marine Habitats (µg/L) (4)
TPH-g	36	450	73	5,000	5,000
TPH-d	150	150	57	2,500	2,500
Benzene	ND<0.005	0.26	ND<0.5	540	71
Toluene	0.067	29	3	400	40
Ethylbenzene	0.036	33	1.8	300	30
Xylenes	0.18	100	4.0	5,300	530

Notes:

1. From report entitled *Additional Site Investigation, 801 Maritime Street, Oakland, CA, Fuel Leak Case RO0000019*, prepared by R&M Environmental and Infrastructure Engineering, Inc., August 27, 2007.

2. From "Table B. Environmental Screening Levels, Shallow Soils (≤ 3 meters bgs)", *Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater*, prepared by California Regional Water Quality Control Board, November 2007.

3. From "Table F-1b. Groundwater Screening Levels (Groundwater IS NOT a Current or Potential Drinking Water Resource)" *Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater,* prepared by California Regional Water Quality Control Board, November 2007.

4. From "Table F-2b. Surface Water Screening Levels/Marine Habitats", *Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater,* prepared by California Regional Water Quality Control Board, November 2007.

Table 2: Groundwater Monitoring Results for MW-1
801 Maritime Street UST Site

Well	Parameters	Event											
		7/10/1996[1]	12/27/1996[2]	3/25/1997[2]	6/23/1997[2]	9/30/1997[2]	12/31/1997[2]	4/17/2001[3]	7/26/2001[3]	10/21/2001[3]	3/13/2002[3]	4/12/2007	9/28/2007
MW-1	TPH-g	180	180	180	170	190	130	160	130	160	110	62	76
	TPH-d	7,100	670	19	3,000	830	ND<48	59	ND<50	ND<100	ND<50	4,800 (H)	4,000 (Y)
	Benzene	27	30	21	20	35	26	11	17	14	8.5	3.5	4.6
	Toluene	14	15	11	11	17	14	6.2	8.7	6.9	4.2	2.2	2.4
	Ethyl Benzene	5.4	5.8	4	4.1	5.2	4.3	2.6	3.2	2.6	1.3	1.2	1.2
	Xylenes	23	26	17	18	22	18	11.2	14.2	11.5	7.3	5.2	5.1
	MTBE	NA	NA	NA	NA	NA	NA	ND<2.0	ND<2.0	ND<2.0	ND<5.0	ND<2.0	ND<2.0
	TDS	NA	NA	1,840	1,320	2,020	1,880	1,860	1,880	1,860	1,100	1,560	1,650
	Temp (C°)	---	---	---	---	---	---	---	---	---	---	17.76	23.36
	E.C. (mS/cm)	---	---	---	---	---	---	---	---	---	---	4.489	4.672
	D.O. (mg/L)	---	---	---	---	---	---	---	---	---	---	0.33	0.10
	pH	---	---	---	---	---	---	---	---	---	---	12.52	12.59
	ORP (mV)	---	---	---	---	---	---	---	---	---	---	-162.5	-157.4
	DTW (ft)	7.36	7.55	7.31	7.55	7.46	7.17	7.59	7.65	7.71	7.52	7.60	7.79
	GW Elevation (ft PD)	6.45	6.26	6.50	6.26	6.09	6.38	6.59	6.53	6.47	6.66	6.58	6.39

Notes:
Analytical reports for water sample collected on 9/28/2007 are contained in Appendix B
Groundwater elevations referenced to Port Datum
Port Datum = Mean Sea Level + 3.20 feet
NA = Not Analyzed
DTW = Depth to water
TPH-g = Total petroleum hydrocarbons as gasoline
TPH-d = Total petroleum hydrocarbons as diesel
MTBE = Methyl tert-butyl ether
TDS = Total dissolved solids
E.C. = Electrical conductivity
D.O. = Dissolved oxygen
ORP = Oxidation reduction potential
H = Heavier hydrocarbons contributed to the quantitation
Y = Sample exhibits chromatographic pattern that does not resemble standard
GW Elevations for 4/12/2007 and 9/28/2007 were calculated based on 2001 surveyed top-of-casing elevations of 14.18 feet (Port of Oakland Datum)

ALISTO ENGINEERING GROUP
WALNUT CREEK, CALIFORNIA

LOG OF BORING MW-1

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SEE SITE PLAN

ALISTO PROJECT NO: 10-339-01 DATE DRILLED: 07/03/98
CLIENT: Port of Oakland
LOCATION: 801 Maritime Street, Oakland, California
DRILLING METHOD: Hollow-Stem Auger (8")
DRILLING COMPANY: V & W Drilling CASING ELEVATION: 10.81 MSL
LOGGED BY: C. Lead APPROVED BY: Al Serino

BLOWS/6 IN.	PID VALUES	WELL DIAGRAM	DEPTH feet	SAMPLES	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
						SM SP	silty to gravely SAND: gray, damp; gravel to 2-inch diameter.
38,50/6"		2" Sch.40 PVC; 2" 0.010" Slotted PVC Screen; Bentonite Seal; #2/12 Sand	5			SP	gravely SAND: gray, wet, very dense; medium- to coarse-grained sand; approximately 30% angular gravel to 1/2-inch.
10,12,32			10			ML	sandy SILT: dark gray, wet; approximately 30% very fine- to fine-grained sand; driftwood (approximately 50% at 11-11.5 foot sample).
2,3,3			15			CL	sandy CLAY: dark gray, wet; approximately 15% very fine- to fine-grained sand.
3,3,3							Same
			20				Stabilized water level measured on July 10, 1998.
			25				
			30				

DESIGNED BY:	CHECKED BY:	LOG OF BORING MW-1 PORT OF OAKLAND 801 MARITIME STREET OAKLAND, CA	DATE: 02/21/2007	FIGURE: 5
DRAWN BY: CA	SCALE:		R&M Environmental	
PROJECT NO:				

Source: Log of Boring MW-1, 801 Maritime Street, Port of Oakland, Alisto Engineering Group, 7/03/98.