PORT OF OAKLAND

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October 31, 2014

Mr. Keith E. Nowell, P.G., C.H.G.
Hazardous Materials Specialist
Alameda County Environmental Health Department
Environmental Protection
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502-6507

Subject:
Alameda County Environmental Health Department ("ACEH") Fuel Leak Case Number RO0000010

Dear Mr. Nowell:

Please find enclosed our document entitled "Methane Self-Monitoring Plan", Port of Oakland, 651 Maritime Street, Oakland, California, dated October 31, 2014. This document is being submitted in accordance with ACEH requirements as specified in your e-mail dated September 24, 2014, that summarizes our meeting on September 24, 2014 and associated documents ACEH has required for submittal for the above referenced site[1].

The Port of Oakland ("Port") has retained ARCADIS, U.S., Inc. ("ARCADIS") to prepare this document on behalf of the Port. If you have any questions or comments regarding the content of this document, please do not hesitate to contact Jeff Rubin at (510) 627-1134.

I declare, under penalty of perjury, that the information and/or recommendations contained in the attached document prepared by ARCADIS are true and correct to the best of my knowledge. Please note that the report is stamped by a Professional Geologist in the State of California.

Sincerely,

Jeffrey R. Jones
Supervisor
Environmental Programs and Planning

Jeffrey L. Rubin, CPSS, REPA
Port Associate Environmental Scientist
Environmental Programs and Planning

Enclosure: ARCADIS document dated October 31, 2014 entitled: "Methane Self-Monitoring Plan", Port of Oakland, 651 Maritime Street, Oakland, California

Cc: Dilan Roe, P.E. (ACEH)
Katherine Brandt, P.G. (ARCADIS)

[1] The Site has been referred to historically as the "Shippers" and "Ringsby" sites, based on the Port tenants that occupied the site at the time of release discoveries. Prior to site redevelopment in 2004, the site was also referred to as 2277 and 2225 Seventh Street. After redevelopment, the Site address became 651 and 555 Maritime Street, although referenced hereafter as only 651Maritime Street.

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Imagine the result

Port of Oakland

Methane Self-Monitoring Plan

651 Maritime Street
Oakland, California
Case No. RO0000010

October 31, 2014

ARCADIS

Darla Zelenak
Project Engineer

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Certified Project Manager

Methane Self-Monitoring Plan

Prepared for:
Port of Oakland

Prepared by:
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Our Ref.:
04656020.HFC1

Date:
October 31, 2014

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Table of Contents

1. Introduction

ARCADIS U.S., Inc. (ARCADIS) prepared this Methane Self-Monitoring Plan on behalf of the Port of Oakland (Port) for the property located at former 2277 Seventh Street and 2225 Seventh Street, in Oakland, California (the Site; Figure 1). Environmental activities at the Site are overseen by the Alameda County Department of Environmental Health (ACEH).

The ACEH LOP originally managed the Site as two separate Leaking Underground Storage Tank (LUST) sites, with LOP case numbers for 2277 and 2225 Seventh Street as RO0000010 and RO0000187, respectively. The two sites are now combined as one LUST site with the address of 651 Maritime Street under RO0000010.

The purpose of this Methane Self Monitoring Plan is to provide the details of the methane monitoring activities that are currently implemented at the site to evaluate fire/explosion hazards associated with methane in soil vapor at and around the site.

2. Site Summary

2.1 Site Description

The Site includes the Harbor Facilities Complex (HFC) at 651 Maritime Street and a portion of the Maritime Support Center (MSC) at 555 Maritime Street (Figure 2). The Site occupies 13.8 acres; the eastern 8 acres are located at 651 Maritime Street and the western 5.8 acres are a portion of 555 Maritime Street. The HFC is composed of maintenance shops, warehouses, and administrative support; a vehicle washing and fueling facility with an aboveground storage tank; and asphalt paved areas for vehicle parking and equipment and supplies storage for the Port maintenance and construction activities. The MSC is a container storage yard.

2.2 Site History

From the late 1960s through the early 1990s, the Site contained underground storage tanks (USTs). Between 1990 and 1992, Dongary Investments (the Port tenant at the time) removed nine USTs adjacent to former Building C 407 (seven diesel USTs and two oil USTs) at 2225 Seventh Street (Figure 2; IRIS 2003). At 2277 Seventh Street, the Port removed four USTs (one waste oil UST, two gasoline USTs, and one oil UST) adjacent to former Building C 401 in 1993 (Figure 2; IRIS Environmental 2003). Subsurface investigations have indicated that the groundwater underlying the Site

contains plumes consisting of free-phase petroleum hydrocarbons in the diesel range. Initial investigations suggested onsite soil contains residual petroleum hydrocarbons and metals.

Groundwater remediation activities have taken place at the Site since 1997 and have included a free-product recovery system with active and passive skimmer pumps, as well as recovery wells. Soil remediation activities consisted of over-excavation during UST removal. New chemicals of concern are not expected to be encountered during future construction.

2.3 Nature and Extent of Methane in Soil Vapor

Soil vapor was analyzed in August 2014 to determine the amount of soil vapor in the vadose zone. Analytical results indicate elevated methane concentrations present above the free phase plume (Table 1). Background locations analyzed during the same event did not show elevated methane concentrations.

The soil vapor at the current onsite buildings has been monitored annually since 2010 (Table 2). Soil vapor is measured at two test ports in the subgrade of the buildings and in two ports in the risers within the buildings. Results indicate the soil vapor below the building is free from methane accumulation.

3. Soil Vapor Venting System

The impacted soil and groundwater are a source of methane and volatile organic compounds (VOCs) in soil vapor. The impacted area is located under HFC Buildings. To mitigate migration of soil vapor into the buildings, a soil vapor venting system was installed beneath the HFC building slabs during construction in 2005. The system consists of the following major components:

- A soil vapor barrier above the subgrade and beneath the building.
- A venting system with horizontal vapor collection pipes under the building structural slab. The pipes are connected to a wind-assisted vapor collection system with vents on the building roof.

4. Methane Self-Monitoring Program

The soil vapor venting system performance monitoring and system maintenance programs will be completed in accordance with the Soil Gas Mitigation System

Operation and Maintenance (O&M) Manual (Treadwell & Rollo, Inc. 2005) and the Site Management Plan (ARCADIS 2014). This section provides a summary of these programs.

4.1 Performance Monitoring Program

The existing soil vapor venting system will be monitored annually. A monitoring event will consist of collecting vapor concentrations and determining air flow directions. A flame ionization detector (FID) will be used at each test port to determine methane concentrations. If methane concentrations in the floor slab exceed 5% of the lower explosive limit, methane concentrations inside the building will be evaluated. If the building concentrations exceed the aforementioned levels, the building will be evacuated and properly vented (open all windows and doors).

4.2 System Maintenance Program

Visual inspections will be performed semi-annually. Visual inspections will include inspecting any wind-assisted turbines, vent caps and test ports or other accessible methane control elements for wear and tear and general maintenance. Minor repairs will be completed within ten business days after discovery of a deficiency. Major repairs will be completed within one month after discovery of a deficiency.

5. Recordkeeping and Reporting

Recordkeeping will be completed in accordance with the Soil Gas Mitigation System O&M Manual (Treadwell & Rollo, Inc. 2005) and the Site Management Plan (ARCADIS 2014).

A report documenting O&M events and performance monitoring results will be submitted every 5 years once no further action status is obtained. An additional report will be submitted in the event floor slab methane concentrations exceed 5% of the lower explosive limit. At a minimum, this report will document the subsequent actions taken to monitor inside the building, as well as any system modifications or repairs.

6. References

IRIS Environmental. 2003. Final Human Health Risk Assessment and Abbreviated Phase II Environmental Site Assessment Report, Future Port of Oakland Field Support Services Complex, 2225 and 2277 Seventh St., Oakland, California. July.

Treadwell & Rollo, Inc. 2005. Soil Gas Mitigation System Operation and Maintenance Manual, Harbor Facilities Center. July.

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Tables

Table 1
Soil Vapor Analytical Results

Methane Self-Monitoring Plan
Port of Oakland, Harbor Facilities Complex
651 Maritime Street, Oakland, CA

Location ID	Date Sampled	Benzene	Toluene	Ethylbenzene	m,p-Xylenes	o-Xylene	Total Xylenes	Carbon Dioxide	Oxygen	Nitrogen	Methane	GRO C6-C12
		ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	Mol %	Mol %	Mol %	Mol %	Mol %
MW-1	8/5/2014	5,100	100	< 100	< 100	< 100	< 200	3.4	5.4	52	31	1,200,000
MW-3	8/5/2014	26	9	< 3.0	3	< 3.0	< 6.0	9.6	3.4	66	5.3	19,000
MW-5	8/5/2014	5.2	8.4	< 0.50	0.85	< 0.50	< 1.35	< 0.10	19	64	< 0.10	750
RW-3	8/5/2014	5.9	9.2	< 0.50	1.2	0.67	1.87	0.41	18	64	2.4	4,000
RW-9	8/5/2014	< 20	< 20	< 20	< 20	< 20	< 40	8.4	7.8	50	13	89,000

General Notes:

< = concentration is less than the reporting limit

m,p-Xylene = meta and para isomers of xylene

Mol% = mole percentage

o-Xylene = ortho isomer of xylene

ppbv = parts per billion by volume

Table 2
Methane Abatement System Check Data

Methane Self-Monitoring Plan
Port of Oakland, Harbor Facilities Complex
651 Maritime Street, Oakland, CA

		T-1				T-2				W-1				W-2			
		Auto Maintenance Shop				Under Stairs in Office Building				Welding Shop				Warehouse			
Date	**Wind Turbines Turning**	**FID w/ carbon filter (ppm)**	**FID w/o carbon filter (ppm)**	**Flow Rate (ft/min)**	**Direction**	**FID w/ carbon filter (ppm)**	**FID w/o carbon filter (ppm)**	**Flow Rate (ft/min)**	**Direction**	**FID w/ carbon filter (ppm)**	**FID w/o carbon filter (ppm)**	**Flow Rate (ft/min)**	**Direction**	**FID w/ carbon filter (ppm)**	**FID w/o carbon filter (ppm)**	**Flow Rate (ft/min)**	**Direction**
6/23/2010	Yes	0.0	0.0	116	Into Port	0.0	0.0	79.0	Into Port	0.0	0.0	177.0	Up	0.0	0.0	177.0	Up
6/24/2011	Yes	0.0	0.0	242	Into Port	0.0	0.0	172.0	Into Port	0.0	0.0	202.0	Up	0.0	0.0	169.0	Up
6/19/2012	Yes	0.0	0.0	--	Into Port	0.0	0.0	--	Into Port	0.0	0.0	--	Up	0.0	0.0	--	Up
6/20/2013	Yes	0.0	0.0	241	Into Port	0.0	0.0	255.0	Into Port	0.0	0.0	145.0	Up	0.0	0.0	98.0	Up
1/13/2014	Yes	0.0	0.0	203	Into Port	0.0	0.0	128.0	Into Port	0.0	0.0	116.0	Up	0.0	0.0	42.0	Up

General Notes:

ppm = parts per million

ft/min = feet per minute

-- = not analyzed

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Figures

REFERENCE: BASE MAP USGS 7.5. MIN. TOPO. QUAD., OAKLAND WEST, CALIFORNIA, 2012.

0 2000' 4000'

Approximate Scale: 1 in. = 2000 ft.

CALIFORNIA

HARBOR FACILITIES COMPLEX, PORT OF OAKLAND
651 MARITIME STREET, OAKLAND, CALIFORNIA

SITE LOCATION MAP

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FIGURE
1

CITY: SAN RAFAEL, CA (PETALUMA) DIV/GROUP: ENVCAD DB: J. HARRIS
C:\Users\jharris\Desktop\ENVCAD\04656020\HFC\100009\DWG\04656020 N01.dwg LAYOUT: 1 SAVED: 10/23/2014 7:37 AM ACADVER: 18.1S (LMS TECH) PAGESETUP: SETUP1 PLOTSTYLETABLE: ARCADIS.CTB PLOTTED: 10/23/2014 7:38 AM BY: HARRIS, JESSICA
XREFS: IMAGES: PROJECTNAME: ---
Oakland West 2012 with aerial.jpg

BAY AREA RAPID TRANSIT

MARITIME STREET

PZ-A (CPT-1)
CPT-2
CPT-3
MW-8A
MW-8
PZ-B (CPT-4)
CPT-5
MW-4
CPT-6
CPT-7
CPT-8
MFC-01
MFC-02
MFC-03
MFC-21
CPT-9
MFC-04
MFC-05
CPT-10
CPT-11
MFC-22
MFC-24
CPT-12
MFC-07
MW-9
MFC-06
MFC-08
MFC-10
CANOPY
MFC-23
CPT-13
MFC-12
PZ-F (CPT-14)
MFC-11
CPT-15
MFC-09
MW-1
MW-2
MW-5
MFC-25
RW-1
MFC-13
CPT-16
MW-7
RW-2
MFC-27
MFC-16
MFC-28
RW-3
MFC-14
MFC-15
MFC-17
MW-3
MFC-26
MW-6
RW-4
MW2
MW-10
MFC-18
RW-5
MFC-19
CPT-29
MFC-29
MFC-30
MW-12
CPT-21
CPT-17
RW-6
RW-7
CPT-18
PZ-D (CPT-19)
RW-8
PZ-C (CPT-20)
RW-9
MFC-31
MFC-20
CPT-22
CPT-31
CPT-30
MFC-32
PZ-E (CPT-24)
MFC-33
MFC-34
MW-11
MFC-35
CPT-23
CPT-32
CPT-25
MFC-46
MW-3
CPT-26
MFC-36
MFC-37
MFC-38
MFC-39
MFC-40
CPT-27
MW1
CPT-28
MFC-41
MFC-42
MFC-43
MFC-44
MFC-45

0 100' 200'
GRAPHIC SCALE

LEGEND

- SITE BOUNDARY
- FENCE
- UST REMOVAL EXCAVATION
- FORMER BUILDING
- GROUNDWATER MONITORING WELL
- DESTROYED GROUNDWATER MONITORING WELL
- RECOVERY WELL
- SOIL BORING
- SOIL AND GRAB GROUNDWATER BORING
- CPT LOCATION (ITSI, 2002)
- PIEZOMETER LOCATION (ITSI, 2002)

HARBOR FACILITIES COMPLEX, PORT OF OAKLAND
651 MARITIME STREET, OAKLAND, CALIFORNIA

SITE MAP

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FIGURE
2

CITY: SAN RAFAEL, CA (PETALUMA) DIV/GROUP: ENVCAD DB: J. HARRIS
C:\Users\jharris\Desktop\ENVCAD\04656020\HFC1100009\DWG\04656020 B01.dwg LAYOUT: 2 SAVED: 10/23/2014 9:13 AM ACADVER: 18.1S (LMS TECH) PAGESETUP: SETUP1 PLOTSTYLETABLE: ARCADIS.CTB PLOTTED: 10/23/2014 9:13 AM BY: HARRIS, JESSICA
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