

State Water Resources Control Board

UST CASE CLOSURE REVIEW SUMMARY REPORT

Agency Information

Agency Name: Orange County Environmental Health Department (County)	Address: 1241 East Dyer Road, Suite 120 Santa Ana, CA 92705
Agency Caseworker: Shyamala Kalyanasundaram	Case No.: 92UT045

Case Information

USTCF Claim No.: 17447	Global ID: T0605901389
Site Name: Mile Square Golf Course	Site Address: 10401 Warner Avenue Fountain Valley CA 92708
Responsible Party (RP): Mile Square Golf Course	Address: 10401 Warner Avenue Fountain Valley CA 92708
USTCF Expenditures to Date: \$248,381	Number of Years Case Open: 20

URL: [http://geotracker.waterboards.ca.gov/profile\\_report.asp?global\\_id=T0605901389](http://geotracker.waterboards.ca.gov/profile_report.asp?global_id=T0605901389)

Summary

The Low-Threat Underground Storage Tank (UST) Case Closure Policy (Policy) contains general and media-specific criteria, and cases that meet those criteria are appropriate for closure pursuant to the Policy. This case meets all of the required criteria of the Policy. A summary evaluation of compliance with the Policy is shown in **Attachment 1: Compliance with State Water Board Policies and State Law**. The Conceptual Site Model upon which the evaluation of the case has been made is described in **Attachment 2: Summary of Basic Case Information (Conceptual Site Model)**. Highlights of the case follow:

An unauthorized leak was reported in April 1992 following the removal of two USTs; one gasoline and one diesel. Site assessments conducted between 1992 and 2002 determined that the petroleum release had resulted in impacts mainly onsite. Groundwater underlying the Site has been monitored and sampled since 1992. Methyl tert-butyl ether (MTBE) is the only contaminant above water quality objectives (WQOs). Other contaminant levels in groundwater are generally either non-detectable or below WQOs. Further, there has been a lack of migration by the dissolved MTBE plume over the past several years, the plume is less than 100 feet in length, and the plume continues to shrink.

The petroleum release is limited to the shallow soil and groundwater. According to data available in GeoTracker, there are no California Department of Public Health (CDPH) regulated supply wells or surface water bodies within 250 feet of the defined plume boundary. No other water supply wells have been identified within 250 feet of the defined plume boundary in files reviewed. Water is provided to water users near the Site by the City of Fountain Valley. The affected groundwater is not currently being used as a source of drinking water, and it is highly unlikely that the affected groundwater will be used as a source of drinking water in the foreseeable future.

Other designated beneficial uses of impacted groundwater are not threatened and it is highly unlikely that they will be, considering these factors in the context of the site setting. Remaining petroleum hydrocarbon constituents are limited, stable and concentrations declining. Corrective actions have been implemented and additional corrective actions are unnecessary. Any remaining petroleum hydrocarbon constituents do not pose significant risk to human health, safety or the environment.

#### Rationale for Closure under the Policy

- General Criteria: The case meets all eight Policy general criteria.
- Groundwater Specific Criteria: The case meets Policy Criterion 1 by Class 1. The contaminant plume that exceeds water quality objectives is less than 100 feet in length. There is no free product. The nearest water supply well or surface water body is greater than 250 feet from the defined plume boundary.
- Vapor Intrusion to Indoor Air: The case meets Policy Criterion 2b. A professional assessment of site-specific risk from exposure shows that maximum concentrations of petroleum constituents in soil and groundwater will have no significant risk of adversely affecting human health.
- Direct Contact and Outdoor Air Exposure: The case meets Policy Criterion 3a. Maximum concentrations in soil are less than those in Policy Table 1. There are no soil sample results in the case record for naphthalene. However, the relative concentration of naphthalene in soil can be conservatively estimated using the published relative concentrations of naphthalene and benzene in gasoline. Taken from Potter and Simmons (1998), gasoline mixtures contain approximately 2 percent benzene and 0.25 percent naphthalene. Therefore, benzene can be directly substituted for naphthalene concentrations with a safety factor of eight. Benzene concentrations from the Site are below the naphthalene thresholds in Policy Table 1. Therefore, the estimated naphthalene concentrations meet the thresholds in Table 1 and the Policy criteria for direct contact by a factor of eight. It is highly unlikely that naphthalene concentrations in the soil, if any, exceed the threshold.

#### Objections to Closure and Responses

The County has not evaluated the Site for closure because the previously submitted documentation for request for closure was incomplete.


**RESPONSE:** Based on readily available information about site conditions including recent groundwater quality data from all ten monitoring wells, there is minimal petroleum contamination at the Site. The case meets all Policy criteria.

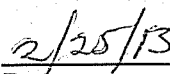
#### Determination

Based on the review performed in accordance with Health & Safety Code Section 25299.39.2 subdivision (a), the Fund Manager has determined that closure of the case is appropriate.

#### Recommendation for Closure

Based on available information, residual petroleum hydrocarbons at the Site do not pose a significant risk to human health, safety, or the environment, and the case meets the requirements of the Policy. Accordingly, the Fund Manager recommends that the case be closed. The State Water Board is conducting public notification. Orange County has the regulatory responsibility to supervise the abandonment of monitoring wells.

  
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Lisa Babcock, P.G. 3939, C.E.G. 1235  
Prepared by: Ramesh Sundareswaran

  
\_\_\_\_\_  
Date

**ATTACHMENT 1: COMPLIANCE WITH STATE WATER BOARD POLICIES AND STATE LAW**

The case complies with the State Water Resources Control Board policies and state law. Section 25296.10 of the Health and Safety Code requires that sites be cleaned up to protect human health, safety, and the environment. Based on available information, any residual petroleum constituents at the site do not pose significant risk to human health, safety, or the environment.

**The case complies with the requirements of the Low-Threat Underground Storage Tank (UST) Case Closure Policy as described below.<sup>1</sup>**

<p><b>Is corrective action consistent with Chapter 6.7 of the Health and Safety Code and implementing regulations?</b>                  The corrective action provisions contained in Chapter 6.7 of the Health and Safety Code and the implementing regulations govern the entire corrective action process at leaking UST sites. If it is determined, at any stage in the corrective action process, that UST site closure is appropriate, further compliance with corrective action requirements is not necessary. Corrective action at this site has been consistent with Chapter 6.7 of the Health and Safety Code and implementing regulations and, since this case meets applicable case-closure requirements, further corrective action is not necessary, unless the activity is necessary for case closure.</p>	<p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p>
<p><b>Have waste discharge requirements or any other orders issued pursuant to Division 7 of the Water Code been issued at this case?</b></p>	<p><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p>
<p><b>If so, was the corrective action performed consistent with any order?</b></p>	<p><input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA</p>
<p><b>General Criteria</b>                  General criteria that must be satisfied by all candidate sites:</p> <p><b>Is the unauthorized release located within the service area of a public water system?</b></p> <p><b>Does the unauthorized release consist only of petroleum?</b></p> <p><b>Has the unauthorized (“primary”) release from the UST system been stopped?</b></p> <p><b>Has free product been removed to the maximum extent practicable?</b></p> <p><b>Has a conceptual site model that assesses the nature, extent, and mobility of the release been developed?</b></p>	<p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA</p> <p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p>

<sup>1</sup> Refer to the Low-Threat Underground Storage Tank Case Closure Policy for closure criteria for low-threat petroleum UST sites.

<p><b>Has secondary source been removed to the extent practicable?</b></p> <p><b>Has soil or groundwater been tested for MTBE and results reported in accordance with Health and Safety Code Section 25296.15?</b></p> <p><b>Nuisance as defined by Water Code section 13050 does not exist at the site?</b></p> <p><b>Are there unique site attributes or site-specific conditions that demonstrably increase the risk associated with residual petroleum constituents?</b></p>	<p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p>
<p><b><u>Media-Specific Criteria</u></b>        Candidate sites must satisfy all three of these media-specific criteria:</p> <p><b>1. Groundwater:</b>        To satisfy the media-specific criteria for groundwater, the contaminant plume that exceeds water quality objectives must be stable or decreasing in areal extent, and meet all of the additional characteristics of one of the five classes of sites:</p> <p><b>Is the contaminant plume that exceeds water quality objectives stable or decreasing in areal extent?</b></p> <p><b>Does the contaminant plume that exceeds water quality objectives meet all of the additional characteristics of one of the five classes of sites?</b></p> <p>If YES, check applicable class: <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5</p> <p><b>For sites with releases that have not affected groundwater, do mobile constituents (leachate, vapors, or light non-aqueous phase liquids) contain sufficient mobile constituents to cause groundwater to exceed the groundwater criteria?</b></p>	<p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA</p> <p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA</p>
<p><b>2. Petroleum Vapor Intrusion to Indoor Air:</b>        The site is considered low-threat for vapor intrusion to indoor air if site-specific conditions satisfy all of the characteristics of one of the three classes of sites (a through c) or if the exception for active commercial fueling facilities applies.</p> <p><b>Is the site an active commercial petroleum fueling facility?</b>        Exception: Satisfaction of the media-specific criteria for petroleum vapor intrusion to indoor air is not required at active commercial petroleum fueling facilities, except in cases where release characteristics can be reasonably believed to pose an unacceptable health risk.</p> <p><b>a. Do site-specific conditions at the release site satisfy all of the applicable characteristics and criteria of scenarios 1 through 3 or all of the applicable characteristics and criteria of scenario 4?</b></p> <p>If YES, check applicable scenarios: <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4</p>	<p><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA</p>

<p><b>b. Has a site-specific risk assessment for the vapor intrusion pathway been conducted and demonstrates that human health is protected to the satisfaction of the regulatory agency?</b></p> <p><b>c. As a result of controlling exposure through the use of mitigation measures or through the use of institutional or engineering controls, has the regulatory agency determined that petroleum vapors migrating from soil or groundwater will have no significant risk of adversely affecting human health?</b></p>	<p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA</p>
<p><b>3. Direct Contact and Outdoor Air Exposure:</b>          The site is considered low-threat for direct contact and outdoor air exposure if site-specific conditions satisfy one of the three classes of sites (a through c).</p> <p><b>a. Are maximum concentrations of petroleum constituents in soil less than or equal to those listed in Table 1 for the specified depth below ground surface (bgs)?</b></p> <p><b>b. Are maximum concentrations of petroleum constituents in soil less than levels that a site specific risk assessment demonstrates will have no significant risk of adversely affecting human health?</b></p> <p><b>c. As a result of controlling exposure through the use of mitigation measures or through the use of institutional or engineering controls, has the regulatory agency determined that the concentrations of petroleum constituents in soil will have no significant risk of adversely affecting human health?</b></p>	<p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA</p>



## ATTACHMENT 2: SUMMARY OF BASIC CASE INFORMATION (Conceptual Site Model)

### Site Location/History

- This Site is located within the Mile Square Park north of Warner Avenue in Fountain Valley. The Site comprises a maintenance facility for the Miles Square Golf Course. It currently houses a maintenance building surrounded by asphalt.
- Site map showing the location of the former USTs, monitoring wells, and groundwater level contours is provided at the end of this closure review summary.
- Nature of Contaminants of Concern: Petroleum hydrocarbons only.
- Source: UST system.
- Date reported: April 1992.
- Status of Release: USTs removed.
- Free Product: None reported.

### Tank Information

Tank No.	Size in Gallons	Contents	Closed in Place/ Removed/Active	Date
1	1,000	Gasoline	Removed	March 1992
2	500	Diesel	Removed	March 1992

### Receptors

- GW Basin: Coastal Plain of Orange County.
- Beneficial Uses: Municipal and Domestic Supply.
- Land Use Designation: Public Use.
- Public Water System: City of Fountain Valley, Water Division.
- Distance to Nearest Supply Well: According to data available in GeoTracker, there are no known public supply wells regulated by CDPH within 250 feet of the defined plume. No other water supply wells were identified within 250 feet of the defined plume in the files reviewed.
- Distance to Nearest Surface Water: There is no identified surface water within 250 feet of the defined plume.

### Geology/Hydrogeology

- Stratigraphy: The Site is underlain by sand and silt with some clay and gravel.
- Maximum Sample Depth: 12 feet below ground surface (bgs).
- Minimum Groundwater Depth: 3.11 feet bgs at monitoring well MW-6.
- Maximum Groundwater Depth: 12.25 feet bgs at monitoring well MW-3.
- Current Average Depth to Groundwater: 6.89 feet bgs.
- Saturated Zones(s) Studied: Approximately 5 – 20 feet bgs.
- Appropriate Screen Interval: Yes.
- Groundwater Flow Direction: Variable, southerly, recently northerly with an average gradient of 0.009 feet/foot (June 2012).

**Monitoring Well Information**

Well Designation	Date Installed	Screen Interval (feet bgs)	Depth to Water (feet bgs) (6/15/2012)
MW-1	September 1992	5-20	8.12
MW-2	September 1992	5-20	6.83
MW-3	September 1992	5-20	7.10
MW-4	January 1993	5-20	7.27
MW-5	January 1993	5-20	Abandoned
MW-6	January 1993	5-20	6.63
MW-7	January 1993	5-20	7.13
MW-8	July 1993	5-20	6.49
MW-9	July 1993	5-20	6.19
MW-10	July 1993	5-20	6.23
MW-11	July 1993	5-20	6.94

**Remediation Summary**

- Free Product: None reported in GeoTracker.
- Soil Excavation: An undetermined amount of soils was removed during UST removal.
- In-Situ Soil/Groundwater Remediation: None reported.

**Most Recent Concentrations of Petroleum Constituents in Soil**

Constituent	Maximum 0-5 feet bgs [mg/kg and (date)]	Maximum 5-10 feet bgs* [mg/kg and (date)]
Benzene	0.019 (11/14/02)	21 (11/14/02)
Ethylbenzene	0.005 (11/14/02)	16 (11/14/02)
Naphthalene	NA	NA
PAHs	NA	NA

NA: Not Analyzed, Not Applicable or Data Not Available

mg/kg: milligrams per kilogram, parts per million

<: Not detected at or above stated reporting limit

PAHs: Polycyclic aromatic hydrocarbons

\*: There was one location out of six in the source area where benzene was detected at 21 ppm and ethylbenzene at 16 ppm at 8 feet bgs in 2002. It is reasonable to expect those concentrations to be much lower at this time due to weathering and biodegradation over a 10 year period.



**Most Recent Concentrations of Petroleum Constituents in Groundwater**

Sample	Sample Date	TPHg (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-Benzene (µg/L)	Xylenes (µg/L)	MTBE (µg/L)	TBA (µg/L)
MW-1	6/15/12	<100	<0.5	<1.0	<1.0	<2.0	<1.0	<10
MW-2	6/15/12	<100	<0.5	<1.0	<1.0	<2.0	4.4	<10
MW-3	6/15/12	<100	<0.5	<1.0	<1.0	<2.0	<1.0	<10
MW-4	6/15/12	<100	<0.5	<1.0	<1.0	<2.0	<1.0	<10
MW-5	6/15/12	NA	NA	NA	NA	NA	NA	NA
MW-6	6/15/12	<100	<0.5	<1.0	<1.0	<2.0	<1.0	<10
MW-7	6/15/12	320	<0.5	<1.0	<1.0	<2.0	11	<10
MW-8	6/15/12	<100	<0.5	<1.0	<1.0	<2.0	<1.0	<10
MW-9	6/15/12	<100	<0.5	<1.0	<1.0	<2.0	<1.0	<10
MW-10	6/15/12	<100	<0.5	<1.0	<1.0	<2.0	<1.0	<10
MW-11	6/15/12	<100	<0.5	<1.0	<1.0	<2.0	<1.0	<10
<b>WQOs</b>	-	<b>50</b>	<b>1</b>	<b>150</b>	<b>300</b>	<b>1750</b>	<b>5</b>	<b>1,200<sup>a</sup></b>

NA: Not Analyzed, Not Applicable or Data Not Available

µg/L: micrograms per liter, parts per billion

<: Not detected at or above stated reporting limit

TPHg: Total petroleum hydrocarbons as gasoline

MTBE: Methyl tert-butyl ether

TBA: Tert-butyl alcohol

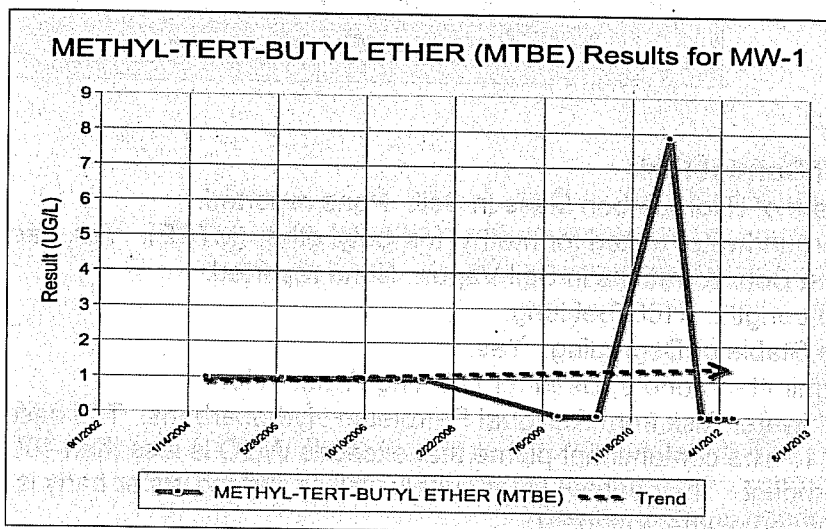
WQOs: Water Quality Objectives, Region 8 Basin Plan

<sup>a</sup>: California Department of Public Health, Response Level

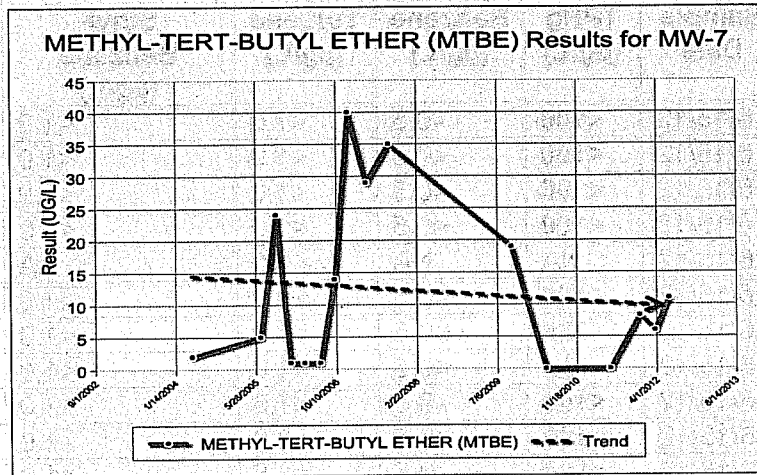
**Groundwater Trends**

There are more than 20 years of irregular groundwater monitoring data for this Site. MTBE trends are shown below: Source Area (MW-1), Near Downgradient (MW-7), and Far Downgradient (MW-10).

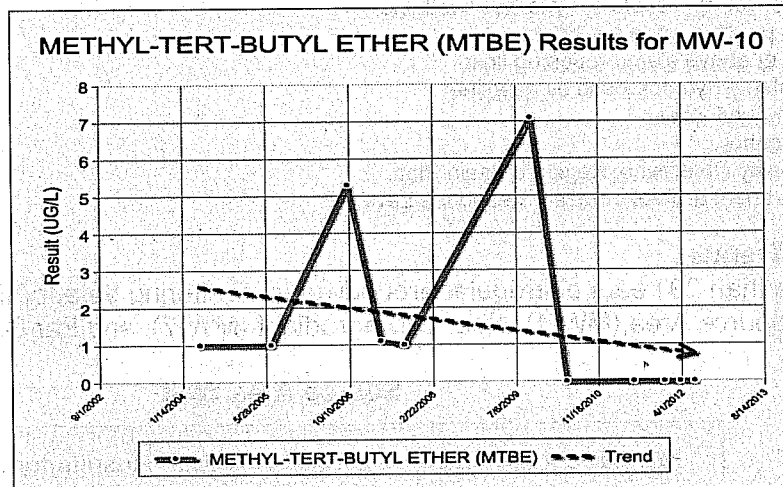
**Source Area Well**



**Near Downgradient Well**



**Far Downgradient Well**



**Evaluation of Current Risk**

- Estimate of Hydrocarbon Mass in Soil: None reported.
- Soil/Groundwater tested for methyl tert-butyl ether (MTBE): Yes, see table above.
- Oxygen Concentrations in Soil Vapor: None reported.
- Plume Length: <100 feet long.
- Plume Stable or Degrading: Yes.
- Contaminated Zone(s) Used for Drinking Water: No.
- Groundwater Risk from Residual Petroleum Hydrocarbons: The case meets Policy Criterion 1, Class 1. The contaminant plume that exceeds WQO is less than 100 feet in length. There is no free product. The nearest water supply well or surface water body is greater than 250 feet from the defined plume boundary.

- **Indoor Vapor Risk from Residual Petroleum Hydrocarbons:** The case meets Policy Criterion 2b. A professional assessment of site-specific risk from exposure shows that maximum concentrations of petroleum constituents in soil and groundwater will have no significant risk of adversely affecting human health. Firstly, benzene which is the primary driver for vapor intrusion from groundwater is below WQO. Secondly, the hydrocarbons in the Site's soils were first detected in 1992. It is likely that those hydrocarbons have biodegraded over the 20-year period since initial discovery. Available information suggests that any remaining hydrocarbons in the soils are low in concentrations as there have been no significant impacts on the underlying groundwater. Not only have the dissolved contaminant levels in the groundwater remained consistently non-detectable in a number of wells but they have also declined over time in others. Thirdly, there is a low likelihood that the only onsite structure (i.e., the golf course maintenance building) is occupied for extended periods of time by workers, which significantly reduces risk from vapor inhalation by a worker.
- **Direct Contact Risk from Residual Petroleum Hydrocarbons:** The case meets Policy Criterion 3a. Maximum concentrations in soil are less than those in Policy Table 1 are satisfied. There are no soil sample results in the case record for naphthalene. However, the relative concentration of naphthalene in soil can be conservatively estimated using the published relative concentrations of naphthalene and benzene in gasoline. Taken from Potter and Simmons (1998), gasoline mixtures contain approximately 2 percent benzene and 0.25 percent naphthalene. Therefore, benzene can be directly substituted for naphthalene concentrations with a safety factor of eight. Benzene concentrations from the Site are below the naphthalene thresholds in Policy Table 1. Therefore, the estimated naphthalene concentrations meet the thresholds in Table 1 and the Policy criteria for direct contact by a factor of eight. It is highly unlikely that naphthalene concentrations in the soil, if any, exceed the threshold.

