

## 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: Tamara Escobedo	Case No.: 87UT050

#### Case Information

USTCF Claim No.: 13541	Global ID: T0605900650
Site Name: Thrifty Oil #383	Site Address: 18520 Brookhurst Street Fountain Valley, CA
Responsible Party: Thrifty Oil Company Attn: Barry Berkett	Address: 13116 Imperial Hwy, Santa Fe Springs, CA
USTCF Expenditures to Date: \$999,356	Number of Years Case Open: 25

URL: [http://geotracker.waterboards.ca.gov/profile\\_report.asp?global\\_id=T0605900650](http://geotracker.waterboards.ca.gov/profile_report.asp?global_id=T0605900650)

#### Summary

The Low-Threat Underground Storage Tank 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 (CSM) 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 release was reported in 1987 during an UST system replacement. A total of 19 various monitoring and remediation wells have been installed since 1987. Dual phase extraction/soil vapor extraction was conducted from January 2001 to September 2007 which removed approximately 59,744 pounds of total petroleum hydrocarbons (TPHg) and 599,100 gallons of contaminated groundwater. Between April 2009 and February 2010, approximately 600 pounds of ozone were injected into groundwater through eight ozone injection points to accelerate tert-butyl-alcohol (TBA) degradation. The Site is currently an active service station.

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 supply wells have been identified within 250 feet of the defined plume boundary. The Site is located seaward of the saltwater intrusion barrier operated by Orange County Water District. Additionally, saltwater intrusion has impacted shallow groundwater in the area. Drinking water is provided to water users by the City of Fountain Valley Public Works. 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 constituents are limited, stable and concentrations declining.

Corrective actions have been implemented and additional corrective actions are not necessary. Any remaining petroleum 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 – Class 1 – The contaminant plume that exceeds Water Quality Objectives (WQOs) is less than 100 feet in length. There is no free product and the nearest water supply well or surface water body is greater than 250 feet from the defined plume boundary.
- Vapor Intrusion to Indoor Air – Soil vapor evaluation is not required because the site is an active commercial petroleum fueling facility.
- Direct Contact and Outdoor Air Exposure – The case meets Policy Criterion 3b. A professional assessment of site-specific risk from exposure shows that maximum concentrations of petroleum constituents in soil will have no significant risk of adversely affecting human health.

#### **Objections to Closure and Responses**

The County provided their objections to UST case closure on September 28, 2012, for this Site:

- The County reported two additional wells located within ½ mile of the Site.  
RESPONSE: Criterion 1, Class 1, requires that the nearest water supply well or surface water body be greater than 250 feet from the defined plume boundary as defined in the Policy. There are no California Department of Public Health (CDPH) regulated public supply wells located within 250 feet of that boundary. Two non-CDPH production wells were identified by the claimant's consultant beyond 250 feet of the defined plume boundary. According to the Orange County Water District, one well (Fountain Valley Cal FV) was located over 500 feet north (up-gradient) of the site, and the other well (Fountain Valley GKAW-FV) was located over 1,000 feet west (cross-gradient) of the site. Both wells were identified as agriculture wells. (GeoHydrologic Consultants, Inc., 2008).
- The plume length is miscalculated.  
RESPONSE: The plume length is correct. There is a separate TBA plume encroaching on the Site from another source. In late 2001, TBA concentrations in site monitoring well BW-1 located on the upgradient corner of the Site were non-detect for TBA and have been consistently rising since then. The upgradient ARCO site has had a UST release reported (including TBA at concentrations as high as 240,000 µg/L) since September 1985 and also has reported a consistent southerly groundwater flow direction.

#### **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 as required by the Policy. Orange County has the regulatory responsibility to supervise the abandonment of monitoring wells.

Thrifty Oil #383  
18520 Brookhurst Street, Fountain Valley, CA  
Claim No: 13541

January 2013

*Lisa Babcock*

**Lisa Babcock, P.G. 3939, C.E.G. 1235**

*1/11/13*

**Date**

**Prepared by: Pat G. Cullen, P.G.**

<input type="checkbox"/> Yes <input type="checkbox"/> No	Is the discharge regulated by any other or otherwise listed permit to discharge for the Water Code as required at this case?
<input type="checkbox"/> Yes <input type="checkbox"/> No	Is the discharge regulated by any other permit?
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**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><u>General Criteria</u></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 checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input 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.  
[http://www.waterboards.ca.gov/board\\_decisions/adopted\\_orders/resolutions/2012/rs2012\\_0016atta.pdf](http://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/2012/rs2012_0016atta.pdf)

<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>        If YES, check applicable scenarios: <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4</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><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><input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA</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 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><input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA</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><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA</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 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

- The Site is an active service station that was operated by ARCO BP until May 2012 and is now operated by Tesoro Refining and Marketing. It is located at the southeast corner of Brookhurst Street and Ellis Avenue in Fountain Valley, CA. The area surrounding the Site is mixed residential and commercial. The northeastern corner of the same intersection is occupied by another gas station, currently owned and operated by ARCO BP.
- An unauthorized release was reported in March 1987, during the UST system removal.
- Nineteen monitoring and remediation wells have been installed on and off the site and monitored regularly.
- Site map showing the locations of the current and former USTs, monitoring wells, and groundwater level contours, is provided at the end of this summary.
- Nature of Contaminants of Concern: Petroleum hydrocarbons only.
- Source: UST system.
- Date reported: March 1987.
- Status of Release: USTs removed.
- Free Product: Historically.

### Tank Information

Tank No.	Size in Gallons	Contents	Closed in Place/ Removed/Active	Date
1	12,000	Gasoline	Removed	May 1987
2	10,000	Gasoline	Removed	May 1987
3	8,000	Gasoline	Removed	May 1987
4	280	Waste Oil	Removed	May 1987
5	12,000	Gasoline	Active	--
6	12,000	Gasoline	Active	--
7	12,000	Gasoline	Active	--

### Receptors

- GW Basin: Coastal Plain of Orange County.
- Beneficial Uses: Municipal and Domestic Supply.
- Land Use Designation: Commercial
- Public Water System: City of Fountain Valley, Public Works, Water Division (City of Fountain Valley, UWMP, May 2011).
- Distance to Nearest Supply Well: According to data available in GeoTracker, there are no DPH water supply wells within 250 feet of the site. Since 1975, the Orange County Water District has operated a saltwater intrusion barrier to keep the ocean water from intruding into underground fresh water supply. Fountain Valley's Salt Water Intrusion Barrier is a series of 28 injection wells running along Ellis Avenue, from Euclid Street to Newland Street, just north of the site. The site is seaward of the injection barrier.
- 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 silty clay, silt with occasional lenses of sand, and silty sand. An organic-rich silty clay lens was encountered in some soil borings at a depth of 15 feet below ground surface (bgs).
- Maximum Sample Depth: 67 feet below ground surface (bgs).
- Minimum Groundwater Depth: 3.20 bgs at monitoring well BW-1.
- Maximum Groundwater Depth: 34.35 feet bgs at monitoring well DW-1.
- Current Average Depth to Groundwater: 8 feet bgs.
- Saturated Zones(s) Studied: approximately 5 - 67 bgs.
- Appropriate Screen Interval: Yes.
- Groundwater Flow Direction: Predominately to the west southwest and southwest in the shallow zone, with a gradient of 0.008 foot/foot (ft/ft), and to the east in the deeper zone, with a gradient of 0.011 ft/ft.

**Monitoring Well Information**

Well Designation	Date Installed	Screen Interval (feet bgs)	Depth to Water (feet bgs) (9/20/2012)
BW-1	November 1995	5-30	8.57
BW-2	November 1995	5-30	9.47
BW-3	November 1995	5-30	8.63
BW-4	November 1995	5-30	8.60
BW-5	November 1995	5-30	8.60
BW-6	November 1995	4-19	8.47
BW-7	November 1995	4-19	8.82
BW-8	November 1995	4-19	9.12
MW-A	November 1995	7.5-12.5	8.80
MW-B	November 1995	6.5-11.5	9.15
HVE-1	August 2000	5-30	8.68
HVE-2	August 2000	5-30	8.71
DW-1	July 2001	56.5-61.5	12.12
DW-2	July 2001	59-64	10.91
DW-3	July 2001	61.5-66.5	10.80
T-1	August 1995	4-19	8.83
T-2	August 1995	7-17	8.60
T-3	August 1995	7-17	8.82
T-4	August 1995	5-15	7.95

**Remedial Summary**

- Free Product: During the UST replacement in May 1987, free product and waste oil were observed in the UST excavation. A free product recovery system was installed. between 1997 and 2002 only sporadic free product was observed. A total of 3,559 gallons of free product had been recovered. No free product has been observed since November 2002.
- Soil Excavation: During the 1987 UST replacement, TPH-affected soil was removed, aerated, and disposed off-site. An additional 200 tons of soil were excavated and removed from the site during a system upgrade in February 2003.
- In-Situ Soil Remediation: From January 2001 to September 2007, a soil vapor extraction system, as part of a dual phase extraction (DPE) system, operated at the site.

- Groundwater Remediation: From June 2001 to September 2007, the DPE system operated at the site. Approximately 59,744 pounds of hydrocarbons and 599,100 gallons of groundwater were removed. From April 2009 to February 2010, 600 pounds of ozone had been injected into groundwater through eight ozone injection points, to accelerate TBA degradation.

**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	NA	0.253j @ 9.5' in CB-7 (6/23/2005) <sup>a</sup>
Ethylbenzene	NA	22.7 @9.5 in CB-8 (6/23/2005) <sup>a</sup>
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

<sup>a</sup>: Remediation activities continued for at least 4 years beyond the date of these samples.

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

Sample	Sample Date	TPHg (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	MTBE (µg/L)	TBA (µg/L)
BW-1	9/202012	<50	<5.0	<25	<25	<25	5.1	2,900
BW-2	9/202012	<50	<1.0	<1.0	<1.0	<5	2.7	600
BW-3	9/202012	125	1.0	<1.0	<1.0	<25	<1.0	1,400
BW-4	9/202012	<50	<1.0	<1.0	<1.0	<25	<1.0	3,400
BW-5	9/202012	<50	<1.0	<1.0	<1.0	<5	1.6	140
BW-6	9/202012	<50	<1.0	<1.0	<1.0	<5	<1.0	
BW-7	9/202012	<50	<1.0	<1.0	<1.0	<5	<1.0	
BW-8	9/202012	<50	<1.0	<1.0	<1.0	<5	<1.0	
MW-A	9/202012	<50	<1.0	<1.0	<1.0	<5	1.6	350
MW-B	9/202012	<50	<1.0	<1.0	<1.0	<5	<1.0	
HVE-1	9/202012	<50	<1.0	<1.0	<1.0	<5	5.6	600
HVE-2	9/202012	<50	1.3	<1.0	<1.0	<5	<1.0	260
DW-1	9/202012	<50	<1.0	<1.0	<1.0	<5	<1.0	
DW-2	9/202012	<50	<1.0	<1.0	<1.0	<5	<1.0	
DW-3	9/202012	<50	<1.0	<1.0	<1.0	<5	<1.0	
T-1	9/202012	<50	<1.0	<1.0	<1.0	<5	<1.0	
T-2	9/202012	<50	<1.0	<1.0	<1.0	<5	<1.0	
T-3	9/202012	<50	<1.0	<1.0	<1.0	<5	<1.0	
T-4	9/202012	<50	<1.0	<1.0	<1.0	<5	<1.0	
<b>WQOs</b>	-	<b>NL<sup>a</sup></b>	<b>1</b>	<b>150</b>	<b>300</b>	<b>1,750</b>	<b>5</b>	<b>1,200<sup>b</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

TPHd: Total petroleum hydrocarbons as diesel

MTBE: Methyl tert-butyl ether

TBA: Tert-butyl alcohol

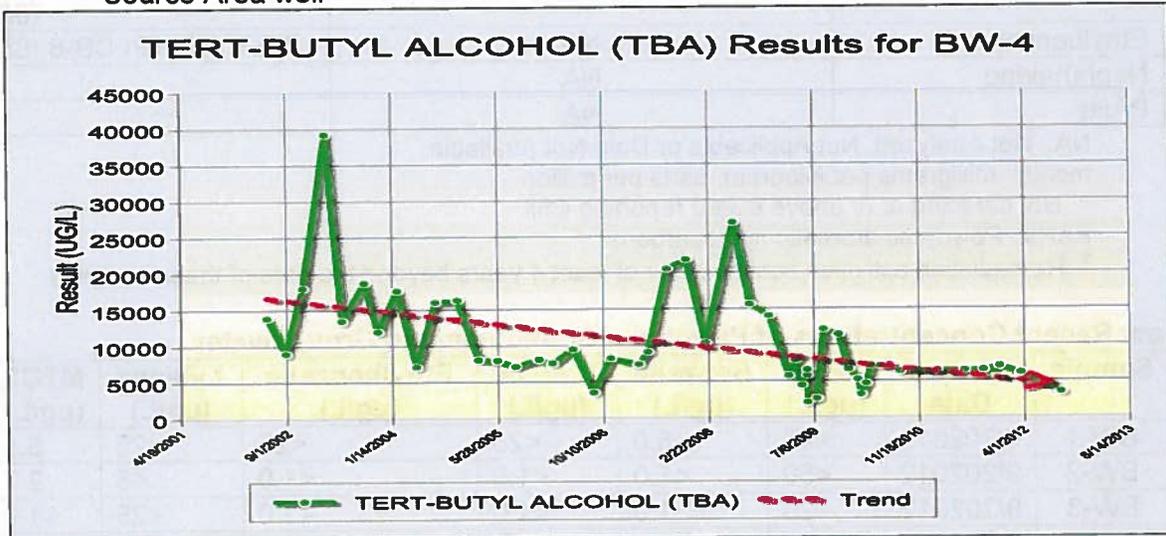
WQOs: Water Quality Objectives, Region 8 Basin Plan

- a: NL Region 8 does not have a listed value for TPHg,
- b: California Department of Public Health, Response Level

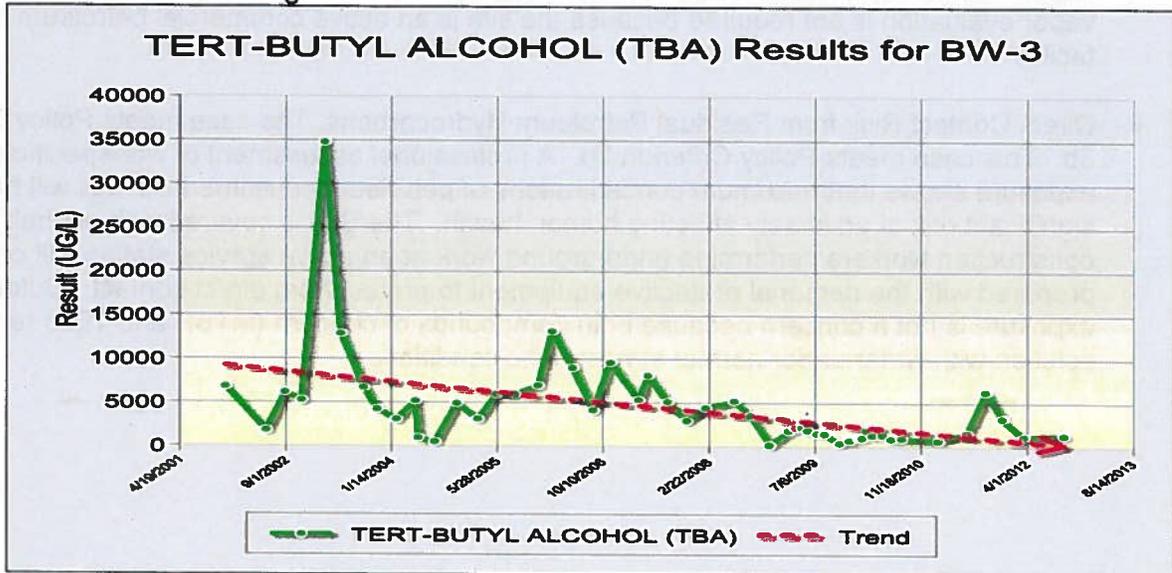
### Groundwater Trends

- There are more than 17 years of groundwater monitoring data for this site. The graphs below show TBA concentration trends in source zone well BW-4, and the downgradient on-site well BW-3. The further downgradient off-site well BW-7 has consistently shown TBA concentrations below detection limits since November 1995.

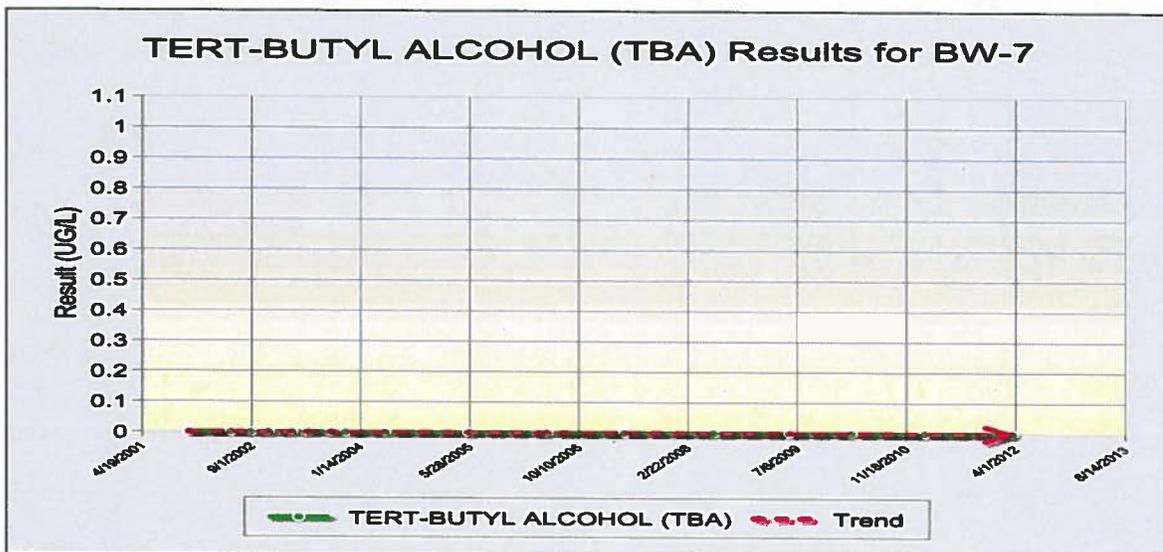
Source Area well



Near Downgradient well



Further 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: Not valid due to peroxide injections.
- 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. The contaminant plume that exceeds water quality objectives is less than 100 feet in length. There is no free product and 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: Active Station Exclusion – Soil vapor evaluation is not required because the site is an active commercial petroleum fueling facility
- Direct Contact Risk from Residual Petroleum Hydrocarbons: The case meets Policy Criterion 3b. This case meets Policy Criterion 3b. A professional assessment of site-specific risk from exposure shows that maximum concentrations of petroleum constituents in soil will have no significant risk of adversely affecting human health. The Site is covered with asphalt and construction workers performing underground work at an active service station will come prepared with the personal protective equipment to protect from direct contact. Outdoor air exposure is not a concern because both compounds of concern (MTBE and TBA) remain in solution with water under normal atmospheric conditions.

