

**REMOVAL PROGRAM  
PRELIMINARY ASSESSMENT/  
SITE INVESTIGATION REPORT  
FOR  
TURKEY BROOK SITE  
OAKVILLE, LITCHFIELD COUNTY, CONNECTICUT  
9 OCTOBER 2013 THROUGH 19 FEBRUARY 2014**

Prepared For:

U.S. Environmental Protection Agency  
Region I  
Emergency Planning and Response Branch  
5 Post Office Square, Suite 100  
Boston, MA 02109-3912

CONTRACT NO. EP-W-05-042

TDD NO. 01-13-09-0009

TASK NO. 0912

DC NO. R-7596

Submitted By:

Weston Solutions, Inc.  
Region I  
Superfund Technical Assessment and Response Team III (START)  
3 Riverside Drive  
Andover, MA 01810

March 2014

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## I. Preliminary Assessment/Site Investigation Forms

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## REMOVAL PRELIMINARY ASSESSMENT

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### Source of Information (concluded)

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*Turkey Brook 091112 GC-MS VOC Water.* Connecticut State Department of Energy and Environmental Protection. 11 September 2012.

☐ Other:

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### Potential Responsible Parties

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**Owners:** Nelson Zackin **Telephone:** (203) 786-5536  
**Address:** 20 McLellan St. Oakville, CT – Quality Automatics, Inc.

**Operators:** Steve White **Telephone:** (860) 945-4795  
**Address:** 15 McLellan St. Oakville, CT

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### Site Access

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**Authorizing Person:** Nelson Zackin (20 McLellan St. Oakville, CT – Quality Automatics, Inc.)

**Date:** 8 August 2013 ☒ **Obtained** ☐ **Verbal**

**Telephone:** (203) 786-5536 ☐ **Not Obtained** ☒ **Written**

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### Historical Preservation

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☐ Site is **Historically Significant or Eligible for Historic Preservation**

#### Contacts Identified

##### 1) State Historical Preservation Officer (SHPO)

**Name:** Mr. Daniel Forrest **Telephone:** (617) 727-8470

##### 2) Tribal Historical Preservation Officer (THPO)

**Name:** **Telephone:** ( )

**Comments:**

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### Physical Site Characterization

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**Background Information:** The Turkey Brook Site (the site) is located at 20 McLennan Drive, Oakville, Connecticut. The approximate geographic coordinates, as measured from the approximate center of the site, are 41° 35' 54.01" north latitude and 73° 04' 32.00" west longitude.

## REMOVAL PRELIMINARY ASSESSMENT

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### Physical Site Characterization (concluded)

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The on-site building is occupied by Quality Automatics, Inc. (QAI), an active automotive parts manufacturing business. The business is operating on the property as a tenant. The site is bordered by Turkey Brook and Rintec Corporation to the west; by McLennan Drive, residential properties, and businesses to the south; by residential properties and Falls Avenue to the east; and by Turkey Brook and industrial properties to the north. The QAI office is located in a different building located across the street (south) at 15 McLennan Drive. Turkey Brook is a navigable waterway which flows south for 0.9 miles and then enters into Steele Brook. Steele Brook flows to the southeast for 1.7 miles and enters the Naugatuck River.

On 31 August 2012, an oil sheen was observed in Turkey Brook, in an area located between QAI to the east and Rintec Corporation to the west, and reported to the Connecticut Department of Energy & Environmental Protection (CT DEEP). CT DEEP responded to the scene and conducted an investigation of the release. Upon arrival, CT DEEP deployed absorbent oil booms to mitigate further impact from the spill. The CT DEEP responder and the CT DEEP Site Assessment and Support Unit performed a subsurface investigation to determine the source of the oil released. Extended diesel range organics (EDRO) analysis from a soil sample indicated a concentration of 932 milligrams per Kilogram (mg/Kg), and EDRO analysis from a groundwater sample indicated a concentration of 1,272,000 micrograms per Liter ( $\mu\text{g/L}$ ). CT DEEP personnel were able to confirm that the oil released was emanating from oil floating on top of the groundwater which was migrating from beneath the building occupied by QAI.

Following the subsurface investigation, CT DEEP met with the owner of the business and toured the facility to observe on-site operations. While observing the operations at the facility, a 55-gallon drum was knocked over by an employee. The employees promptly cleaned up the spill by sweeping the oil into a corner of the building, then applying Speedi-Dri®. The CT DEEP representative expressed concern regarding their clean-up procedures and investigated the area where the oil and oily debris were stored. The CT DEEP representative noticed a gap between the floor and the wall which could provide a pathway for the oil to migrate into the soil and into the groundwater. CTDEEP determined that this clean-up procedure had been in place for some time and that the amount of oil that had been released over time was unknown. The operations and oil storage in the area also appeared to be contributing to the problem via a cracked oil hose that was leaking product onto the floor in this same area. The owner of QAI assumed responsibility for the release and agreed to implement clean-up and remediation actions, with CT DEEP providing agency oversight. Mr. Steve White (operator of QAI) procured the services of Environmental Services, Inc. (ESI) for the installation of two 2-inch observation wells (MW-04 and MW-06) located along the northeast side of the QAI building. At this time, Mr. White notified CT DEEP that he was unable to continue with clean-up activities due to financial reasons.

**Background Description of Substances Possibly Present, Known or Alleged:** The chemical contaminants of concern are total petroleum hydrocarbons (TPHs), which have been detected in groundwater and soil samples.

## REMOVAL PRELIMINARY ASSESSMENT

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### Existing Analytical Data

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( ) **Real-Time Monitoring Data:** None.

(✓) **Sampling Data:** The CT DEEP and the CT DEEP Site Assessment and Support Unit performed a subsurface investigation to determine the source of the oil released. EDRO analysis from a soil sample indicated a concentration of 932 mg/Kg, and EDRO analysis from a groundwater sample indicated a concentration of 1,272,000 µg/L.

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### Potential Threat

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Evaluation of the following criteria, as identified in 40 CFR 300.415 [The National Oil and Hazardous Substances Pollution Contingency Plan (NCP)], is typically performed during a preliminary assessment/site investigation for the purpose of conducting a removal action.

- i. Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances, pollutants or contaminants.
- ii. Actual or potential contamination of drinking water supplies or sensitive ecosystems.
- iii. Hazardous substances or pollutants or contaminants in drums, barrels, tanks, or other bulk storage containers, that may pose a threat of release.
- iv. High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface, that may migrate.
- v. Weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released.
- vi. Threat of fire or explosion.
- vii. The availability of other appropriate federal or state response mechanisms to respond to the release.
- viii. Other situations or factors that may pose threats to public health or welfare or the environment.

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### Prior Response Activities

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( ) **PRP**      (✓) **STATE**      ( ) **FEDERAL**      ( ) **OTHER**

**Brief Description:** On 9 October 2012, the potentially responsible party (PRP) contacted CT DEEP and notified them that he was financially unable to continue clean-up actions at the site. CT DEEP responded to the site and noticed a visible sheen on the water. CT DEEP called the National Response Center (NRC) to report the incident and assumed control of the response.

## REMOVAL PRELIMINARY ASSESSMENT

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### Prior Response Activities (continued)

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They proceeded to deploy absorbent booms and to conduct clean-up actions. Clean-up actions consisted of continual replacement of absorbent booms in three locations on Turkey Brook and the installation of an oil recovery system. The oil recovery system included two recovery wells with an oil sensor and a pump which pumped oil from the top of the groundwater when the sensor was triggered. This system collected approximately 250 gallons of oil.

On 25 July 2013, CT DEEP requested assistance from the U.S. Environmental Protection Agency (EPA) with the source removal actions implemented at the site. EPA and CT DEEP personnel conducted a site walk on 21 August 2013 and observed an oil sheen on the water that was being contained by absorbent booms. The absorbent booms in two of the three deployment areas were completely saturated and potentially contributing to the current sheen. The water level of Turkey Brook was observed to be low, providing a conduit for additional oil to be released from the banks of the brook. EPA and CT DEEP personnel met with the tenant and property owner, and the owner and tenant provided verbal confirmation to allow EPA to assume responsibility of the clean-up actions due to a lack of funds and resources from both the PRP and CT DEEP.

On 22 August 2013, the EPA On-Scene Coordinator (OSC) initiated an emergency action to remediate the visible sheen on Turkey Brook and to prevent additional oil from further migrating and contaminating areas downstream from the site. Emergency response actions initiated by the OSC consisted of mobilizing appropriate personnel, equipment, utilities, and supplies; removing oil-contaminated booms from Turkey Brook and replacing them with clean absorbent booms; removing any visible oil sheen from Turkey Brook using appropriate absorbent material; storing any oil or oily debris collected in appropriate containers on site in a secure location; marking containers for identification and disposal; and ensuring that the stored drums were secure and did not continue to pose a substantial threat of a discharge to Turkey Brook.

An on-site reconnaissance was conducted by Weston Solutions, Inc., Superfund Technical Assessment and Response Team (START) on 9 October 2013. Features on the site included a one-story building, paved parking lot in front of the building, grassy areas, seven monitoring wells, and several catchbasins. The building comprised two main rooms: one large room measuring approximately 80 feet x 100 feet, and another room measuring approximately 30 feet x 80 feet. A machine shop was located in the larger room, while the smaller room was used as a storage room. One large aboveground storage tank (AST) and a smaller (275-gallon) AST were observed in the northwest and southwest corners of the machine shop, respectively. The floor of the machine shop was covered with Speedy-Dri®.

Continuous air monitoring was conducted with the MultiRAE and radiation meter throughout the on-site reconnaissance. A maximum reading of 27 parts per million (ppm) was recorded for volatile organic compounds (VOCs) on the MultiRAE; while the radiation meter was 8 microR/hour, while walking through the machine shop. No readings above background levels were recorded outside of the building during the on-site reconnaissance.

## REMOVAL PRELIMINARY ASSESSMENT

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### Prior Response Activities (concluded)

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The following monitoring wells/piezometers were observed outside of the backdoor of the building: two monitoring wells constructed of 4-inch-diameter polyvinyl chloride (PVC) with steel outside protective casings; two monitoring wells constructed of 2-inch-diameter PVC; and two piezometers/monitoring wells constructed of 0.5-inch-diameter PVC. Two T-shaped pipes, constructed of PVC, were also noted in this area. A water level meter and oil/water interface probe were not available at this time; therefore, the depths of the monitoring wells and piezometers, depth to water, and oil thickness (if any) were not recorded. One absorbent oil boom was observed in Turkey Brook near the monitoring wells. No oil or sheen was noted upstream of this boom.

A prominent sheen was noted in the water of Turkey Brook upgradient of a boom located on the north side of the road. A fill and vent pipe leading into the 275-gallon AST was noted, and a second vent pipe leading into the large AST was noted protruding from the building wall in the vicinity of the monitoring wells. Four roof drain pipes are located along each side (east and west) of the building.

The banks of Turkey Brook are stabilized by a series of gabions, approximately 2 feet wide, that were installed in 2009 and were not part of the response actions. Three 55-gallon drums containing used oil booms were located against the building wall near the monitoring wells, and 18 55-gallon drums containing used oil booms were located against the chain-link fence near the southwestern corner of the building.

A second on-site reconnaissance was conducted by START, EPA, ERRS, and the CT DEEP Contractor on 25 October 2013. Six relatively new booms were observed on Turkey Brook, and a sheen was noted upstream of some of the booms along the northern side of McLellan Drive. A prominent sheen was also noted in the water on the south side of McLellan Road where the surface water in Turkey Brook flowed against the concrete wall along the property line of the QAI office building located at 15 McLellan Road.

The team entered the machine shop and back room where the oil spill occurred to observe potential boring locations. A maximum reading of 107 parts per million (ppm) was recorded for VOCs on the MultiRAE. The team proceeded outside to the area of the monitoring wells along the northwestern section of the property. An oil/water interface probe was used to measure the depth to water and oil product thickness in three of the monitoring wells. Depth to water in the southernmost 4-inch monitoring well was 10.26 feet below the top of the PVC casing, and a product thickness of 0.04 feet was measured. Product thickness increased going northward to the second 4-inch monitoring well (0.99 feet) and to the 2-inch monitoring well (4.26 feet) near the concrete pad in front of the back door. Headspace readings in these wells ranged from 3 - 10 ppm.

## REMOVAL PRELIMINARY ASSESSMENT

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### Priority for Site Investigation

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(✓) High                      ( ) Medium                      ( ) Low                      ( ) None  
Comments:

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### Report Generation

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**Originator:** Colin Cardin, EIT                      **Date:** 29 January 2014  
**Affiliation:** Weston Solutions, Inc. (START)                      **Telephone:** (978) 552-2115  
**TDD No.:** 01-13-09-0009                      **Task No.:** 0912

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**Site Name:** Turkey Brook  
**Town:** Oakville

**Address:** 20 McLellan Street (St).  
**County:** Litchfield      **State:** Connecticut (CT)

<b>Date of Inspection:</b> 9 October 2013	<b>Time of Inspection:</b> 1030 hours (hrs) - 1230 hrs
<b>Date of Inspection:</b> 25 October 2013	<b>Time of Inspection:</b> 1230 hours (hrs) - 1330 hrs
<b>Date of Inspection:</b> 20 November 2013	<b>Time of Inspection:</b> 0700 hours (hrs) - 1700 hrs
<b>Date of Inspection:</b> 21 November 2013	<b>Time of Inspection:</b> 0700 hours (hrs) - 1700 hrs
<b>Date of Inspection:</b> 22 November 2013	<b>Time of Inspection:</b> 0700 hours (hrs) - 1700 hrs
<b>Date of Inspection:</b> 25 November 2013	<b>Time of Inspection:</b> 0900 hours (hrs) - 1700 hrs
<b>Date of Inspection:</b> 5 December 2013	<b>Time of Inspection:</b> 0800 hours (hrs) - 1100 hrs
<b>Date of Inspection:</b> 8 January 2014	<b>Time of Inspection:</b> 0900 hours (hrs) - 1400 hrs
<b>Date of Inspection:</b> 9 January 2014	<b>Time of Inspection:</b> 0900 hours (hrs) - 1400 hrs
<b>Date of Inspection:</b> 18 February 2014	<b>Time of Inspection:</b> 0930 hours (hrs) - 1600 hrs
<b>Date of Inspection:</b> 19 February 2014	<b>Time of Inspection:</b> 0600 hours (hrs) - 1000 hrs

**Weather Conditions:** 9 October 2013 - sunny, breezy, 50 degrees Fahrenheit (°F)  
25 October 2013 - sunny, breezy, 45 °F  
20 November 2013 - sunny, cold, breezy, 25 °F  
21 November 2013 - sunny, cold, breezy, 20 °F  
22 November 2013 - steady rain, 35 °F  
25 November 2013 - overcast, 35 °F  
5 December 2013 - overcast, 30 °F  
8 January 2014 - sunny, breezy, 0 °F  
9 January 2014 - sunny, breezy 0 °F  
18 February 2014 - snowing, breezy, 34 °F  
19 February 2014 - snowing, breezy, 37 °F

**Site Status at Time of Inspection:**

(✓) ACTIVE  
( ) INACTIVE

**Comments:** The site building is occupied by Quality Automatics, Inc. (QAI), an active automotive parts manufacturing business. The business is operating on the property as a tenant. The site is bordered by Turkey Brook and Rintec Corporation to the west; by McLennan Drive, residential properties, and businesses to the south; by residential properties and Falls Avenue to the east; and by Turkey Brook and industrial properties to the north. Turkey Brook is a

## REMOVAL SITE INVESTIGATION

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### Agencies/Personnel Performing Inspection

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navigable waterway which flows south 0.9 miles and enters into Steele Brook. Steele Brook flows 1.7 miles to the southeast and enters the Naugatuck River.

	<u><b>Names</b></u>	<u><b>Program</b></u>
(✓) <b>EPA:</b>	Ted Bazenas Mia Pasquerella	U.S. Environmental Protection Agency (EPA) Region I Emergency Planning and Response Branch (EPRB)
(✓) <b>EPA Contractor:</b>	George Mavris Colin Cardin Eric Ackerman Ken Robinson	Weston Solutions, Inc. (Weston), Superfund Technical Assessment and Response Team III (START)
(✓) <b>State:</b>	Dave Poynton	Connecticut Department of Energy & Environmental Protection (CTDEEP)

( ) **Other:**

**Current Owner Based on Field Interview:** Mr. Nelson Zackin

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### Physical Site Characteristics

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<b>Parameter</b>	<b>Quantities/Extent</b>
( ) <b>Cylinders:</b>	
( ) <b>Drums:</b>	
( ) <b>Lagoons:</b>	
(✓) <b>Tanks:</b>	(✓) <b>Above:</b> One large (approximately 500-gallon) aboveground storage tank (AST) and a smaller (275-gallon) AST were observed in the northwest and southwest corners of the machine shop inside the QAI Building. An approximate 1,000-gallon solvent tank (empty) was observed in the southwest corner of the smaller room attached to the machine shop area.
( ) <b>Below:</b>	
( ) <b>Asbestos:</b>	

## REMOVAL SITE INVESTIGATION

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### Physical Site Characteristics (concluded)

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Parameter	Quantities/Extent
<input type="checkbox"/> Piles:	
<input type="checkbox"/> Stained Soil:	
<input checked="" type="checkbox"/> Stressed Vegetation:	Surface water ecosystem.
<input type="checkbox"/> Landfill:	
<input checked="" type="checkbox"/> Population in Vicinity:	According to the information in GIS ArcMap 10.1, there are 768 people within ¼-mile, 1,999 people within ½-mile, and 6,468 people within 1 mile of the site.
<input checked="" type="checkbox"/> Wells:	<input checked="" type="checkbox"/> <b>Monitoring:</b> The following monitoring wells were observed on the QAI property, in the grassy area located along the northwestern section of the on-site building: two 4-inch-diameter polyvinyl chloride (PVC) with steel outside protective casings; two 2-inch-diameter PVC; one 1-inch diameter PVC; and two 0.5-inch-diameter PVC piezometers/monitoring wells. In addition, one flush-mount monitoring well is located in the pavement near the front loading dock.
<input type="checkbox"/> Drinking:	

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### Physical Site Observations

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The Turkey Brook Site (the site) is located at 20 McLellan Drive, Oakville, Litchfield County, Connecticut. The on-site building is occupied by Quality Automatics, Inc. (QAI), an active automotive parts manufacturing business. The business is operating on the property as a tenant. The site is bordered by Turkey Brook and Rintec Corporation to the west; by McLennan Drive, residential properties, and businesses to the south; by residential properties and Falls Avenue to the east; and by Turkey Brook and industrial properties to the north. Turkey Brook is a navigable waterway which flows south into Steele Brook. Steele Brook flows to the southeast and enters the Naugatuck River.

## REMOVAL SITE INVESTIGATION

### Field Sampling and Analysis

<u>Matrix/Analytical Parameter</u>	<u>Field Instrumentation</u>				
	<u>CGI/O<sub>2</sub></u>	<u>RAD</u>	<u>PID/VOC</u>	<u>FID</u>	<u>Other<sup>3</sup></u>
<b>Background Readings:</b>	0.0%/20.9%	8 µR/hr <sup>1</sup>	0.0 ppm <sup>2</sup>	0.0 ppm	0/0 <sup>2</sup>
<b>Air:</b>	0.0%/20.9%	8 µR/hr	0.0 ppm	0.0 ppm	0/0
<b>Air (inside building):</b>	0.0%/20.9%	8 µR/hr	27-107 ppm	NA <sup>4</sup>	240/0
<b>Soil:</b>	0.0%/20.9%	8 µR/hr	0.0 -7.6 ppm	0.0 ppm	0/0
<b>Groundwater:</b>					
<b>Other (Headspace on Monitoring Wells):</b>	0.0%/20.9%	8 µR/hr	3 - 10 ppm	NA <sup>4</sup>	0/0

- <sup>1</sup> µR/hr = microRoentgens per hour  
<sup>2</sup> ppm = parts per million  
<sup>3</sup> Carbon monoxide (CO)/hydrogen sulfide (H<sub>2</sub>S)  
<sup>4</sup> NA

### Field Quality Control Procedures

☒ **SOP Followed**

☐ **Deviation From SOP**

**Comments:** START followed the protocol outlined in the document entitled, *Sampling and Analysis Plan for the Turkey Brook Site, Oakville, Litchfield County, Connecticut*, dated November 2013.

### Description of Sampling Conducted

On 20 through 22 November 2013, EPA OEME personnel advanced 10 soil borings outside of the 20 McLellan St. building and on the adjacent western property owned by Rintec, Inc. START personnel advanced 10 soil borings (SBC-01, SBC-02, SBC-03, SBC-04, SBC-05, SBC-06, SBC-07, SBC-08, SBC-09, and SBC-10) inside the 20 McLellan St. building. The macrocores collected from both drilling crews were screened with the MultiRAE, the macrocore sleeves were cut, soil samples were collected, and the soils were characterized. Twenty soil samples (including one duplicate sample) were collected for oil ID analysis. The on-site wells/piezometers were not labeled; therefore, START labeled them beginning with MW-01 (southernmost well) and through MW-07 (northernmost well). START proceeded to collect a product/oil sample from MW-06, a 2-inch-diameter monitoring well located adjacent to the cement pad at the exterior door of the back room. The sample was collected from MW-06 using a disposable bailer. Three 40-ml vials were filled, and the samples were submitted to the OEME Laboratory for volatile organic compound (VOC), polychlorinated biphenyl (PCB), metals, and Oil ID analyses.

## REMOVAL SITE INVESTIGATION

### Analyses

Analytical Parameter	Media	Laboratory
<input checked="" type="checkbox"/> VOC	<input type="checkbox"/> AIR	<input checked="" type="checkbox"/> NERL (OEME)
<input checked="" type="checkbox"/> PCB	<input type="checkbox"/> WATER	<input type="checkbox"/> CLP
<input type="checkbox"/> PESTICIDE	<input checked="" type="checkbox"/> SOIL	<input checked="" type="checkbox"/> PRIVATE
<input type="checkbox"/> METALS	<input checked="" type="checkbox"/> SOURCE (OIL PRODUCT)	<input type="checkbox"/> SAS
<input type="checkbox"/> CYANIDE	<input type="checkbox"/> SEDIMENT	<input type="checkbox"/> SOW
<input type="checkbox"/> SVOC	<input type="checkbox"/> BULK ACM	<input type="checkbox"/> FIELD
<input type="checkbox"/> TOXICITY		
<input type="checkbox"/> DIOXIN		
<input type="checkbox"/> ASBESTOS		
<input checked="" type="checkbox"/> OTHER – Oil ID		
<input type="checkbox"/> IDW		

### Receptors

#### Comments

☐ Drinking Water

☐ Private:

☒ Municipal:

The Site and vicinity are serviced by the municipal drinking water supply.

☒ Groundwater:

Based on the most recent groundwater elevation data collected in November 2013, groundwater beneath the site area ranges from approximately 7.75 feet (ft) to 9.94 ft below the ground surface. Based on surface topography and the releases of oil from inside the QAI Building, groundwater is assumed to flow northeast and north.

☒ Unrestricted Access:

Pedestrian access to the site is not restricted.

☒ Population in Proximity:

Approximately 6,468 people live within a 1-mile radius of the site.

☐ Sensitive Ecosystem:

☐ Other:

## REMOVAL SITE INVESTIGATION

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### Additional Procedures for Site Determination

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( ) **Biological Evaluation**

( ) **ATSDR**

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### Site Determination

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Depending on further information, criteria that may be met by the site include 40 CFR 300.415 [b] [2], parts:

- i. Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances, pollutants or contaminants.
- ii. Actual or potential contamination of drinking water supplies or sensitive ecosystems.
- iv. High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface, that may migrate.
- v. Weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released.
- vii. The availability of other appropriate federal or state response mechanisms to respond to the release.
- viii. Other situations or factors that may pose threats to public health or welfare or the environment.

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### Report Generation

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**Originator:** Colin Cardin, EIT  
**Affiliation:** Weston Solutions, Inc. (START)  
**TDD No.:** 01-13-09-0009

**Date:** 11 March 2014  
**Telephone:** (978) 552-2115  
**Task No.:** 0912

## II. Narrative Chronology

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## **NARRATIVE CHRONOLOGY**

### **Site Description**

The Turkey Brook Site (the site) is located at 20 McLennan Drive, Oakville, Connecticut (see Appendix A, Figure 1) [1]. The approximate geographic coordinates, as measured from the approximate center of the site, are 41° 35' 54.01" north latitude and 73° 04' 32.00" west longitude [2]. The on-site building is occupied by Quality Automatics, Inc. (QAI), an active automotive parts manufacturing business. The QAI office is located in a different building across the street (south) at 15 McLennan Drive. The business is operating on the property as a tenant. Due to various oil releases at the facility over time, there is currently a layer of oil on top of the groundwater underneath the facility and along the western exterior of the building. The oil is migrating from the groundwater to Turkey Brook causing a sheen on the water. The site is bordered by Turkey Brook and Rintec Corporation to the west; by McLennan Drive, residential properties, and businesses to the south; by residential properties and Falls Avenue to the east; and by Turkey Brook and industrial properties to the north [2]. Turkey Brook is a navigable waterway which flows south into Steele Brook. Steele Brook flows to the southeast and enters the Naugatuck River.

### **Site History and Previous Investigations**

On 31 August 2012, an oil sheen was observed in Turkey Brook, in an area located between QAI to the east and Rintec Corporation to the west, and reported to the Connecticut Department of Energy & Environmental Protection (CT DEEP). CT DEEP responded to the scene and conducted an investigation of the release. Upon arrival, CT DEEP deployed absorbent oil booms to mitigate further impact from the spill. The CT DEEP responder and the CT DEEP Site Assessment and Support Unit performed a subsurface investigation to determine the source of the oil released. Extended diesel range organics (EDRO) analysis from a soil sample indicated a concentration of 932 milligrams per Kilogram (mg/Kg), and EDRO analysis from a groundwater sample indicated a concentration of 1,272,000 micrograms per Liter (µg/L) [3,4]. CT DEEP personnel were able to confirm that the oil released was emanating from oil floating on top of the groundwater which was migrating from beneath the building occupied by QAI [5].

Following the subsurface investigation, CT DEEP met with the owner of the business and toured the facility to observe on-site operations. While observing the operations at the facility, a 55-gallon drum was knocked over by an employee. The employees promptly cleaned up the spill by sweeping the oil into a corner of the building, then applying Speedi-Dri®. The CT DEEP representative expressed concern regarding their clean-up procedures and investigated the area where the oil and oily debris were stored. The CT DEEP representative noticed a gap between the floor and the wall which could provide a pathway for the oil to migrate into the soil and into the groundwater. CT DEEP determined that this clean-up procedure had been in place for some time and that the amount of oil that had been released over time was unknown. The operations and oil storage in the area also appeared to be contributing to the problem via a cracked oil hose that was leaking product onto the floor in this same area. The owner of QAI assumed responsibility for the release and agreed to implement clean-up and remediation actions, with CT

DEEP providing agency oversight [2]. Mr. Steve White (operator of QAI) procured the services of Environmental Services, Inc. (ESI) for the installation of two 2-inch observation wells (MW-4 and MW-6) located along the northeast side of the QAI building.

On 9 October 2012, the potentially responsible party (PRP) contacted CT DEEP and notified them that he was financially unable to continue clean-up actions at the site. CT DEEP responded to the site and noticed a visible sheen on the water. CT DEEP called the National Response Center (NRC) to report the incident and assumed control of the response. They proceeded to deploy absorbent booms and to conduct clean-up actions. Clean-up actions consisted of continual replacement of absorbent booms in three locations on Turkey Brook and the installation of an oil recovery system. The oil recovery system included two recovery wells with an oil sensor and a pump which pumped oil from the top of the groundwater when the sensor was triggered. This system collected approximately 250 gallons of oil [2].

On 25 July 2013, CT DEEP requested assistance from the U.S. Environmental Protection Agency (EPA) with the source removal actions implemented at the site. EPA and CT DEEP personnel conducted a site walk on 21 August 2013 and observed an oil sheen on the water that was being contained by absorbent booms. The absorbent booms in two of the three deployment areas were completely saturated and potentially contributing to the current sheen. The water level of Turkey Brook was observed to be low, providing a conduit for additional oil to be released from the banks of the brook. EPA and CT DEEP personnel met with the tenant and property owner, and the owner and tenant provided verbal confirmation to allow EPA to assume responsibility of the clean-up actions due to a lack of funds and resources from both the PRP and CT DEEP [2].

On 22 August 2013, the EPA On-Scene Coordinator (OSC) initiated an emergency action to remediate the oil discharging into Turkey Brook and to prevent additional oil from further migrating and contaminating areas downstream from the site. Emergency response actions initiated by the OSC consisted of mobilizing appropriate personnel, equipment, utilities, and supplies; removing oil-contaminated booms from Turkey Brook and replacing them with clean absorbent booms; removing any visible oil sheen from Turkey Brook using appropriate absorbent material; storing any oil or oily debris collected in appropriate containers on site in a secure location; marking containers for identification and disposal; and ensuring that the stored drums were secure and did not continue to pose a substantial threat of a discharge to Turkey Brook.

From October 2013 to January 2014, Weston Solutions, Inc. (Weston), Superfund Technical Assessment and Response Team (START) conducted activities under a Preliminary Assessment/Site Investigation (PA/SI) at the site. These activities are discussed in the following Site Activities section.

### **Site Activities**

On 9 October 2013, Weston Solutions, Inc. Superfund Technical Assessment and Response Team (START) member George Mavris arrived on site at the Turkey Brook Site in Oakville, Connecticut. Mr. Mavris calibrated a MultiRAE instrument having the following detectors:

carbon monoxide (CO), volatile organic compound (VOC), hydrogen sulfide (H<sub>2</sub>S), oxygen (O<sub>2</sub>), and lower explosive limit (LEL) detectors] [6]. A Micro-R (radiation) meter was checked for functionality. Calibration information was recorded on field data sheets [7]. Background readings for the MultiRAE parameters were as follows: CO = 0 parts per million (ppm), VOC = 0 ppm, H<sub>2</sub>S = 0 ppm, LEL = 0%, and O<sub>2</sub> = 20.9%.

Mr. Mavris proceeded to the office of the QAI building located at 20 McLellan Drive and asked the receptionist if the operator was available. The receptionist stated that the operator, Mr. Steve White, had his office across the street in another building (15 McLellan Drive). Mr. Mavris then proceeded to the office across the street and met with Mr. White. Mr. Mavris identified himself and explained the purpose of his visit (to conduct an on-site reconnaissance and identify potential sampling locations inside of the building at 20 McLellan Drive, as well as along the grassy area bordering Turkey Brook). Mr. White was very cooperative and asked one of his employees to guide Mr. Mavris inside the building and along Turkey Brook.

Mr. Mavris and the employee entered the on-site building, where the oil discharging into Turkey Brook originated. The on-site building comprised two main rooms: one large room measuring approximately 80 feet x 100 feet, and another room (back room) measuring approximately 30 feet x 80 feet. The machine shop was located in the larger room; while the back room was used for storage. Continuous air monitoring was conducted with the MultiRAE and a radiation meter throughout the site walk. A maximum reading of 27 ppm was recorded for VOCs on the MultiRAE, and the radiation meter displayed 8 microR/hour in the machine shop. One large aboveground storage tank (AST) and a smaller (275-gallon) AST were observed in the northwest and southwest corners of the machine shop, respectively (see Appendix C, Photo-Documentation Log). The floor of the machine shop was covered with Speedy-Dri®. The back room was somewhat empty except for a few machines and miscellaneous items.

The site walk then proceeded outside the backdoor by the northwestern corner of the on-site building. Mr. Mavris photographed the area, including monitoring wells, grassy areas, walls, and an oil absorbent boom in Turkey Brook (see Appendix C, Photo-Documentation Log).

Mr. Mavris observed the following monitoring wells/piezometers outside the backdoor: two monitoring wells constructed of 4-inch-diameter polyvinyl chloride (PVC) with steel outside protective casings; two monitoring wells constructed of 2-inch-diameter PVC; and two piezometers/monitoring wells constructed of 0.5-inch-diameter PVC. Two T-shaped pipes, constructed of PVC, were also noted in this area (see Appendix C, Photo-Documentation Log). Since a water level meter and oil/water interface probe were not available, the depths of the monitoring wells and piezometers, depth to water, and oil thickness (if any) were not recorded.

The grassy area between the chain-link fence and west side of the building along Turkey Brook was approximately 7 feet wide. A grassy area, approximately 2.5 feet wide, extended beyond the fence. The banks of Turkey Brook were stabilized by gabions, approximately 2 feet wide. Three 55-gallon drums containing used absorbent oil booms were located against the building wall near the monitoring wells. One oil absorbent boom was observed in Turkey Brook near the monitoring wells. No oil or sheen was noted upstream or downstream of this boom. The

elevation difference between the ground surface near the monitoring wells and the water in Turkey Brook was approximately 8 feet.

Mr. Mavris walked back through the on-site building. Mr. Mavris completed photo-documenting the inside of the building and proceeded outside to complete the on-site reconnaissance.

Mr. Mavris proceeded to the small bridge over Turkey Brook (north side of McLellan Road) and observed the absorbent oil boom located just north of the bridge. A prominent sheen was noted in the water upgradient of the oil absorbent boom (see Appendix C, Photo-Documentation Log). The elevation difference between the ground surface near the paved parking lot of the on-site building and the water in Turkey Brook was approximately 10 feet. Eighteen 55-gallon drums containing used oil absorbent booms were located against the chain-link fence near the southwestern corner of the on-site building. A fill and vent pipe leading into the 275-gallon AST was noted, and a second vent pipe leading into the large AST was noted protruding from the building wall in the vicinity of the monitoring wells. Four roof drain pipes were located along the western side of the on-site building. Other site features noted include: another monitoring well on the pavement in front of the garage door in front of the on-site building, several catchbasins in front of the on-site building on both sides of the road, catchbasins directly over Turkey Brook on both sides of the road, and Call Before U Dig (CBUD) utility markings on the property and road.

A blue pipe and a black pipe, oriented parallel to McLellan Road and crossing Turkey Brook, were observed from the south side of McLellan Road (see Appendix C, Photo-Documentation Log). As the water in Turkey Brook flowed south past these pipes, it flowed against a concrete wall along the property line of the QAI office building located at 15 McLellan Road.

Mr. Mavris spoke with Mr. White, who stated that the monitoring wells were last checked for oil in early September, and the system used to remove oil from the wells was removed in mid-September 2013. This system was installed by CT DEEP's contractor, Alpine Environmental. This system pumped oil from the two 4-inch-diameter wells and into 55-gallon drums. Mr. White also stated that he was in the process of moving the machine shop operations (currently at 20 McLellan Drive) to the office building located across the street (15 McLellan Drive). Mr. Mavris pre-marked both sides of the street for CBUD.

On 25 October 2013, at 1230 hours, START member Mavris arrived on site at the Turkey Brook Site in Oakville, Connecticut. Mr. Mavris calibrated a MultiRAE instrument having CO, VOC, H<sub>2</sub>S, O<sub>2</sub>, and LEL detectors, and recorded calibration information on field data sheets [6]. Background readings for the MultiRAE parameters were as follows: CO = 0 ppm, VOC = 0 ppm, H<sub>2</sub>S = 0 ppm, LEL = 0%, and O<sub>2</sub> = 20.9%.

Mr. Mavris proceeded over to the small bridge over Turkey Brook (north side of McLellan Road) and observed the absorbent oil booms located just north of the bridge. Six relatively new booms were observed, and a sheen was noted upstream of some of the booms. A prominent sheen was also noted in the water on the south side of McLellan Road, where the surface water in Turkey Brook flowed against the concrete wall along the property line of the QAI office building located at 15 McLellan Road (see Appendix C, Photo-Documentation Log).

START Mavris met with EPA OSC Mia Pasquerella and Emergency Rapid Response Services (ERRS) Response Manager (RM) John Kiley. The team observed the oil absorbent booms located north of McLellan Road and then proceeded inside of the QAI building located at 20 McLellan Drive. The team walked through the machine shop and into the back room where the release of oil occurred. A maximum reading of 107 ppm was recorded for VOCs on the MultiRAE in the northern portion of the building where the oil release occurred.

OSC Pasquerella discussed proposed soil boring locations inside of the on-site building and outside. Approximately 10 soil borings would be installed inside the back room north of the machine shop, along the walls of the room. Approximately two soil borings would be advanced outside of the on-site building along the northeastern corner, and four to five soil borings would be advanced in the area of the monitoring wells along the northwestern section of the on-site building. A few soil borings would be advanced west of Turkey Brook, on the Rintec Corporation (Rintec) property. Sampling depths would be determined based on subsurface conditions; however, attempts would be made to reach the water table. Soil samples would be collected at specified intervals, based on PID readings, observations, and/or olfactory criteria [8]. Soil samples would be submitted to EPA's Office of Environmental Measurement and Evaluation (OEME) for a Total Petroleum Hydrocarbons (TPH)-type analysis. A product (oil) sample would also be collected from one of the monitoring wells containing oil [9]. The product sample would be submitted to OEME for Oil ID, VOC, polychlorinated biphenyls (PCB), and metals analyses.

The team proceeded outside to the area of the monitoring wells along the northwest section of the property. Mr. Mavris measured the oil thickness in three of the monitoring wells, using an oil/water interface probe. The southernmost 4-inch monitoring well had a product thickness of 0.04 feet; the other 4-inch well had a product thickness of 0.99 feet; and the 2-inch monitoring well outside the backdoor near the northwestern section of the building had a thickness of 4.26 feet. Headspace readings of 10 ppm were recorded with a MultiRAE at both of the 4-inch monitoring wells, and a reading of 3 ppm was recorded in the 2-inch monitoring well. ERRS RM John Kiley stated that he had generated four additional 55-gallon drums containing used oil absorbent booms.

Mr. Mavris pre-marked the property in front of Rintec for CBUD. Site activities were completed, and all personnel departed the site. Mr. Mavris contacted CBUD the following day.

On 20 November 2013, START members Mr. George Mavris, Mr. Colin Cardin, Mr. Eric Ackerman, and Mr. Ken Robinson arrived at the Turkey Brook site, located at 20 McLellan Drive, Oakville, Connecticut, to conduct field activities. Field activities included advancing subsurface borings, collecting soil samples, characterizing soil sample cores, collecting a product/oil sample from one of the monitoring wells, and measuring product thickness in on-site monitoring wells. EPA OSC Mia Pasquerella arrived on site.

START personnel calibrated air monitoring instruments, including a two MultiRAE Plus units having CO, H<sub>2</sub>S, VOC, O<sub>2</sub>, and LEL sensors. Ambient background levels recorded were as follows: CO = 0 ppm, H<sub>2</sub>S = 0 ppm, VOCs = 0.0 ppm, O<sub>2</sub> = 20.9 percent (%), and LEL = 0 %.

OEME personnel Mr. Gerry Keefe and Mr. Dan Granz arrived on site with a Geoprobe unit. START member Mavris conducted a tailgate health and safety meeting and discussed site history and details of the HASP, including chemical, physical, and biological hazards associated with the site, and directions to the nearest hospital. Site personnel reviewed and signed the Site-Specific HASP and tailgate attendance sheet.

START established a decontamination area and soil classification/sampling area along the western section of the parking lot and decontaminated the sampling equipment (hand-held augers, stainless steel bowls, and scoops). OEME personnel began advancing borings outside of the QAI building, while the START team began advancing borings inside of the building in the back room, located north of the machine shop [10]. The outside borings would be advanced to 12 feet below ground surface (bgs) if possible, and the inside borings would be advanced to 4 feet below the soil material directly beneath the concrete floor. Four borings were advanced by the OEME crew (SB-01, SB-02, SB-03, and SB-04) using a Geoprobe. Borings SB-01 and SB-02 were advanced along the eastern side of the QAI building and adjacent to the storage room, and SB-03 and SB-04 were advanced along the northern side of the QAI building near the release area of the storage room (see Appendix A, Figures 2 and 3).

START personnel examined the floor of the storage room inside of the QAI building for subsurface utilities and spoke with one of workers regarding the storm drain running beneath the building. The proposed coring locations were then marked. A coring machine was used to drill through the concrete floor, and the START crew advanced one boring (SBC-02) inside of the QAI building in the back room using a pneumatic hammer (see Figure 3). The concrete floor was approximately 4 inches thick. START used the coring machine to drill through the concrete floor in five additional locations.

The OEME and START drilling crews delivered the macrocores to the START soil classifier, who screened the tops and bottoms of the macrocore liners with a MultiRAE, cut the macrocore sleeves and screened the entire length of the macrocore with a MultiRAE, collected soil samples, and characterized the soil. Field data sheets were prepared, and boring logs were prepared (see Appendix E, Boring Logs). Five soil samples were collected for Oil ID analysis. START photo-documented site activities (see Appendix C, Photo-documentation Log).

The exterior boreholes were filled with their respective cuttings and bentonite, then topped off with sand. Geoprobe, coring, and sampling equipment was decontaminated; and the decontamination and soil classification areas were disassembled. Field activities were completed for the day, and all personnel departed the site. The soil samples collected were placed on ice and secured in a sample cooler overnight.

On 21 November 2013, START members Mr. Mavris, Mr. Cardin, Mr. Ackerman, and Mr. Robinson arrived at the Turkey Brook site to continue with field activities initiated on 20 November 2013. EPA OSC Mia Pasquerella arrived on site. START personnel calibrated the two MultiRAE Plus instruments. Ambient background levels recorded were as follows: CO = 0 ppm, H<sub>2</sub>S = 0 ppm, VOCs = 0.0 ppm, O<sub>2</sub> = 20.9 percent (%), and LEL = 0 %.

OEME personnel Mr. Keefe and Mr. Granz arrived on site with a Geoprobe unit. START member Mavris conducted a tailgate health and safety meeting and discussed chemical, physical, and biological hazards associated with the site, and proposed scope of work activities. Site personnel signed the tailgate attendance sheet.

START established the decontamination area and soil classification/sampling area along the western section of the parking lot and decontaminated the sampling equipment (hand held augers, stainless steel bowls, and scoops). OEME personnel continued advancing exterior soil borings, while the START team continued with inside coring activities in the back room of the QAI building.

Six borings were advanced by the OEME crew (SB-05, SB-06, SB-07, SB-08, SB-09, and SB-10) using the Geoprobe. Borings SB-05 and SB-06 were advanced on the Rintec property located west of Turkey Brook (see Appendix A, Figure 3). Borings SB-07, SB-08, SB-09, and SB-10 were advanced along the western side of the QAI building, north of the monitoring wells installed in that area (see Appendix A, Figure 3).

START used the coring machine to drill through the concrete floor in the remaining locations, and advanced nine borings (SBC-01, SBC-03, SBC-04, SBC-05, SBC-06, SBC-07, SBC-08, SBC-09, and SBC-10) [10].

The macrocores collected from both drilling crews were screened with the MultiRAE, the macrocore sleeves were cut, soil samples were collected, and the soils were characterized (see Appendix E, Boring Logs). Twenty soil samples (including one duplicate sample) were collected for Oil ID analysis. Following discussions with OSC Mia Pasquerella, it was determined the soil samples could not be analyzed at the U.S. OEME Laboratory for Oil ID analysis; and OSC Pasquerella requested that START procure a Delivery of Analytical Services (DAS) laboratory to conduct the analysis. The START Lead Chemist subsequently procured Con-Test Analytical Laboratory, East Longmeadow, MA, to conduct the analysis.

The exterior boreholes were filled with their respective cuttings and bentonite, then topped off with sand. The holes drilled through the floor storage room of the QAI building were filled with concrete. The locations of the 10 borings inside of the QAI building were measured from reference points inside of the building, and the locations of the exterior borings were also measured from known reference points and subsequently recorded with a global positioning system (GPS) unit. START photo-documented site activities (see Appendix C, Photo-documentation Log).

Two monitoring wells located on the Rintec property were gauged and found to be dry. OEME personnel Mr. Keefe and Mr. Granz completed advancing soil borings with the Geoprobe and departed the site. Geoprobe, coring, and sampling equipment was decontaminated; and the decontamination and soil classification areas were disassembled. Field activities were completed for the day, and START personnel departed the site.

On 22 November 2013, START members Mr. Mavis, Mr. Cardin, Mr. Ackerman, and Mr. Robinson arrived at the Turkey Brook site to continue with field activities initiated on 20 November 2013. EPA OSC Mia Pasquerella arrived on site.

START member Mavis conducted a tailgate health and safety meeting and discussed chemical, physical, and biological hazards associated with the site, and proposed scope of work activities. Site personnel signed the tailgate attendance sheet. Due to the steady rain, the MultiRAE instruments were not used.

START established the soil classification/sampling area along the western section of the parking lot. The remaining four macrocores (SBC-07, SBC-08, SBC-09, and SBC-10) were cut, soil samples were collected, and the soil characterized. Field data sheets were completed and boring logs were prepared (see Appendix E, Boring Logs). The four soil samples were collected for Oil ID analysis.

The wells/piezometers were not labeled; therefore, START labeled them beginning with MW-01 (southernmost well) and through MW-07 (northernmost well) (see Appendix A, Figure 3). An oil/water interface probe was used to measure depth to water and depth to oil in the large (> 1-inch-diameter wells) (see Appendix B, Table 2). START proceeded to collect a product/oil sample from MW-06, a 2-inch-diameter monitoring well located adjacent to the cement pad at the exterior door of the back room. A sample was collected from MW-06 using a disposable bailer. Three 40-ml vials were filled and the samples were submitted to the OEME Laboratory for VOC, PCB, metals, and Oil ID analyses (see Appendix D, Chain-of-Custody Records).

Field activities were completed, and START personnel demobilized from the site.

On 25 November 2013, OSC Ted Bzenas, ERRS RM Michael Quinlan, and START member Cardin mobilized to the site to oversee the pickup of 14 drums containing petroleum waste (absorbent oil booms). OSC Bzenas, RM Quinlan, and START member Cardin inspected the drums and ensured that the appropriate labels were present and visible. START member Cardin gathered GPS coordinates of outdoor soil boring locations with a Trimble GeoXT GeoExplorer 2008 [12]. At 1615 hours, a representative from New England Disposal Technologies arrived on site to load out the drums. The drums were secured for transportation to the disposal facility, and the manifest was signed.

On 5 December 2013, START member George Mavis arrived on site at the Turkey Brook Site in Oakville, Connecticut and met with Mike Quinlan (ERRS). Mike Watts and Jon Wicks, from TMC Environmental, Inc. (TMC), arrived on site. START member Mavis conducted a tailgate health and safety meeting and discussed chemical, physical, and biological hazards associated with the site. Personnel signed the tailgate attendance sheet. TMC Environmental, Inc. crew began removing old sausage absorbent booms and replacing them with new ones along Turkey Brook. The first absorbent boom was deployed upstream of spill area, approximately 90 feet from the northwest corner of the QAI building; the second boom was placed at the northwest corner of the QAI building; the third was placed approximately 15 feet south of the northwest corner of the QAI building; and the fourth (a two-set boom) was placed just south of the loading dock area of the QAI building. A pillow absorbent boom was deployed in Turkey Brook on the



north side of McLellan Road. This was a Petroguard® Absorbent Pillow consisting of two 5-foot sections tied together. One sausage absorbent boom was deployed approximately 10 feet downstream of the pillow boom, beneath the road. The used absorbent booms were placed in 55-gallon drums and secured on site along the western side of the QAI Building.

TMC personnel showed START member Mavris three areas where oil sheens were present from leachate breakouts originating in the northern banks of Turkey Brook, upstream of the spill area at the QAI building (see Appendix A, Figure 2, and Appendix C, Photo-Documentation Log).

On 8 January 2014, START member Robert Sharp arrived at the Turkey Brook Site in Oakville, Connecticut and met with OSC Ted Bzenas and ERRS RM Mike Quinlan. Mr. Sharp calibrated a MultiRAE Plus instrument having the following detectors: CO, VOC, H<sub>2</sub>S, O<sub>2</sub>, and LEL. Calibration information was recorded on field data sheets. Background readings for the MultiRAE Plus were as follows: CO = 0 ppm, VOC = 0 ppm, H<sub>2</sub>S = 0 ppm, LEL = 0%, and O<sub>2</sub> = 20.9%. Mike Watts and Andrew Fredericks (TMC) arrived on site. START member Sharp conducted a tailgate health and safety meeting and discussed chemical, physical, and biological hazards associated with the site. Personnel signed the tailgate attendance sheet. ERRS recorded product and water level readings from four monitoring wells located on the west side of the building: MW-02, MW-04, MW-05, and MW-06. Product thickness measurements were as follows: MW-02 (0.1 feet), MW-04 (0.6 feet), MW-05 (1.82 feet), and MW-06 (4.4 feet). Based on the measurements, ERRS began bailing product out of wells MW-05 and MW-06. Product and water level measurements were then collected from wells MW-05 and MW-06 every 30 minutes for approximately 4 hours to observe the recharge rate for the product and water in the wells. CT DEEP representative Dave Poynton arrived on site in the afternoon and discussed the site history with OSC Bzenas.

On 9 January 2014, START member Sharp, OSC Bzenas, ERRS RM Quinlan, and TMC crew arrived back on site to continue with field activities. ERRS collected product and water level measurements from MW-05 and MW-06 to observe the rate of product recharge in the wells. Well MW-05 had a product thickness of 0.9 feet, and well MW-06 had a product thickness of 0.98 feet. The ERRS crew then assembled a GeoTech SpOILer Controless Recovery Pump into MW-06. The SpOILer is a pneumatic bladder pump with a floating skimmer attachment connected to an air compressor that is designed to pump floating product from the well. The SpOILer pump was operated in well MW-06 for approximately 30 minutes and reduced the product thickness in the well from 0.98 feet to less than 0.1 feet. The process was repeated in well MW-05, and after operating for approximately 30 minutes the product thickness was reduced from 0.9 feet to less than 0.1 feet.

TMC personnel showed START member Sharp and OSC Bzenas three areas where oil sheens were observed in the past from leachate breakouts originating in the northern banks of Turkey Brook, upstream of the spill area at the QAI building. The oil sheens were not visible due to a large amount of ice in the brook. OSC Bzenas decided not to collect any surface water samples from these locations at that time.

EPA, START, and ERRS personnel demobilized from the site.

On 18 February 2014, START member Kenneth Robinson arrived on site and met with ERRS RM Quinlan and New Hampshire Boring Company (NHBC) personnel. The purpose for field activities was to install recovery wells inside the storage room of the QAI Building. The recovery wells inside the building would be installed near the northwest wall where the release of oil had occurred. A health and safety meeting was conducted, and the HASP was reviewed and signed by all personnel. START personnel then calibrated air monitoring equipment before performing an initial site walk.

START, ERRS, and NHBC conducted a site walk and checked the proposed recovery well locations. Continuous air monitoring was conducted with a MultiRAE Plus unit during the site walk. Upon entering the machine shop of the QAI Building, the alarm on the MultiRAE sounded and the following readings were observed on the unit: CO = 240 ppm, VOCs = 46 ppm, O<sub>2</sub> = 20.5%, H<sub>2</sub>S = 0.0 ppm, and LEL = 0%. ERRS and START personnel proceeded to open the back door and to turn on an industrial fan to provide ventilation to reduce the CO in the room prior to beginning drilling operations.

OSC Bzenas arrived on site and was informed of elevated CO and VOC levels. OSC Bzenas informed the administrative personnel in the office of the high CO and VOC readings in the machine shop and suggested that the Fire Department be contacted in order to determine the source of the CO emissions. The administrative assistant said that workers had been complaining of headaches for more than a week and that she would inform the property owner of the elevated CO readings. START personnel continued air monitoring, and no elevated CO levels were detected in the office areas; however, CO levels of 14 ppm were recorded in the work zone (storage room).

NHBC personnel began setting up equipment and loading their equipment through the overhead door in the front of the property. A total of five recovery wells were proposed: four to be drilled inside the building, and one outside of the building. OSC Bzenas decided that split-spoons would only be advanced on only one boring, at a frequency of one split-spoon every 5-foot interval. The borings would be advanced using the drive-and-wash method. Continuous air monitoring was conducted during drilling. Due to elevated CO (44 ppm) and VOC (51 ppm) readings, Mr. Robinson contacted the START Health and Safety Officer (HSO) and discussed the elevated readings. The START HSO advised that ventilation of the building should continue to ensure CO levels remained below 50 ppm.

NHBC personnel began advancing the first boring and encountered refusal at 6 feet below the floor surface (bfs); the boring was abandoned. The NHBC crew moved to a second location, where refusal was encountered at 6.5 feet bfs. The NHBC crew moved to a third location, where refusal was again encountered at 6 feet bfs. Groundwater had not been encountered in any of these borings. NHBC began advancing a boring at a fourth location. The boring was advanced to 9 feet bfs and labeled MW-08.

QAI office personnel contacted a furnace servicing company, and it was determined that the high concentrations of CO were a result of a malfunctioning furnace heating the QAI facility. Site activities were completed, and all personnel departed site for the day.

On 19 February 2014, site activities resumed. The furnace in the QAI facility had been turned off due to the CO levels detected the day before, and the workers were not allowed back in the building. Air monitoring was conducted with the MultiRAE Plus unit and the following background readings were recorded prior to beginning site activities: CO = 9 ppm, VOCs = 42.7 ppm, O<sub>2</sub> = 20.9%, H<sub>2</sub>S = 0.0 ppm, and LEL = 0%. NHBC personnel completed the construction of MW-08. The well completion log may be found in Appendix E, Boring Logs/Well Completion Log.

The NHBC crew attempted to advance two additional borings; however, refusal was encountered between 2 and 3.5 feet bfs. The five borings where refusal was encountered were backfilled with soil cuttings and sand, then capped with concrete.

The NHBC crew developed MW-08 by pumping the well dry several times, and removing approximately 15 gallons of water from the well. NHBC began packing equipment in preparation to depart the site.

Mr. Robinson used an oil/water interface probe to record water and oil levels in MW-02 and MW-06, the monitoring wells located near the backdoor of the facility (see Appendix A, Figure 3). The top of the PVC casing was used as a reference point for the measurements. The depth to the oil/water interface in MW-06 was 9.7 feet, and the depth to the top of oil was 8.95 feet. The depth to the top of water in MW-02 was 9.06 feet, and no oil was detected in the well.

Site activities were completed and all personnel departed the site.

### **Analytical Data Summaries**

On 9 December 2013, analytical data for the soil samples were received from Con-Test Analytical Laboratory. Analytical results of the 20 soil samples, including one duplicate sample, indicated that total petroleum hydrocarbons (TPH) (C9 - C36) were detected in 15 of the 20 soil samples with concentrations ranging from 53 milligrams per kilogram (mg/Kg) to 21,000 mg/Kg [12]. Sample contamination matched reference standards for motor oil, mineral spirits, or asphalt. Chromatograms also showed heavy residual hydrocarbons similar to asphalt, and possibly weathered mineral spirits (see Appendix B, Table 1, Summary of TPH Results).

On 4 December 2013, VOC, PCB, and Oil ID analytical data for the product/oil sample were received from EPA's OEME Laboratory. Analytical results of the one product/oil sample indicated that the sample chromatogram contained two characteristic "humps": one "hump" appeared to be a lubricating oil (i.e. motor oil, cutting oil) in the C18 - C38 hydrocarbon range; and other appeared to be a lighter compound (i.e. petroleum distillate) in the C10 - C13 hydrocarbon range (Gasoline Range Organics) [14].

Lead was the only metal detected in the product sample collected from monitoring well MW-06, at a concentration of 52 mg/Kg. No VOCs or PCBs were detected in any product/oil sample. [13, 15, 16].

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## REFERENCES

- [12] Con-Test Analytical Laboratory. December 2013. Laboratory Report. Project Number: DAS Case #0855F. Laboratory Work Order Number: 13K1055. TPH in Soil, Turkey Brook Site – Oakville, CT
- [13] U.S. Environmental Protection Agency, New England Regional Laboratory, Office of Environmental Measurement and Evaluation. June 2012. Laboratory Report, Project Number 13110054, VOAs in Soil – High Level Method, Turkey Brook – Oakville, Connecticut.
- [14] U.S. Environmental Protection Agency, New England Regional Laboratory, Office of Environmental Measurement and Evaluation. June 2012. Laboratory Report, Project Number 12050032, Oil Identification, Turkey Brook – Oakville, Connecticut.
- [15] U.S. Environmental Protection Agency, New England Regional Laboratory, Office of Environmental Measurement and Evaluation. June 2012. Laboratory Report, Project Number 12050032, PCBs in Oils, Turkey Brook – Oakville, Connecticut.
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### III. Appendices

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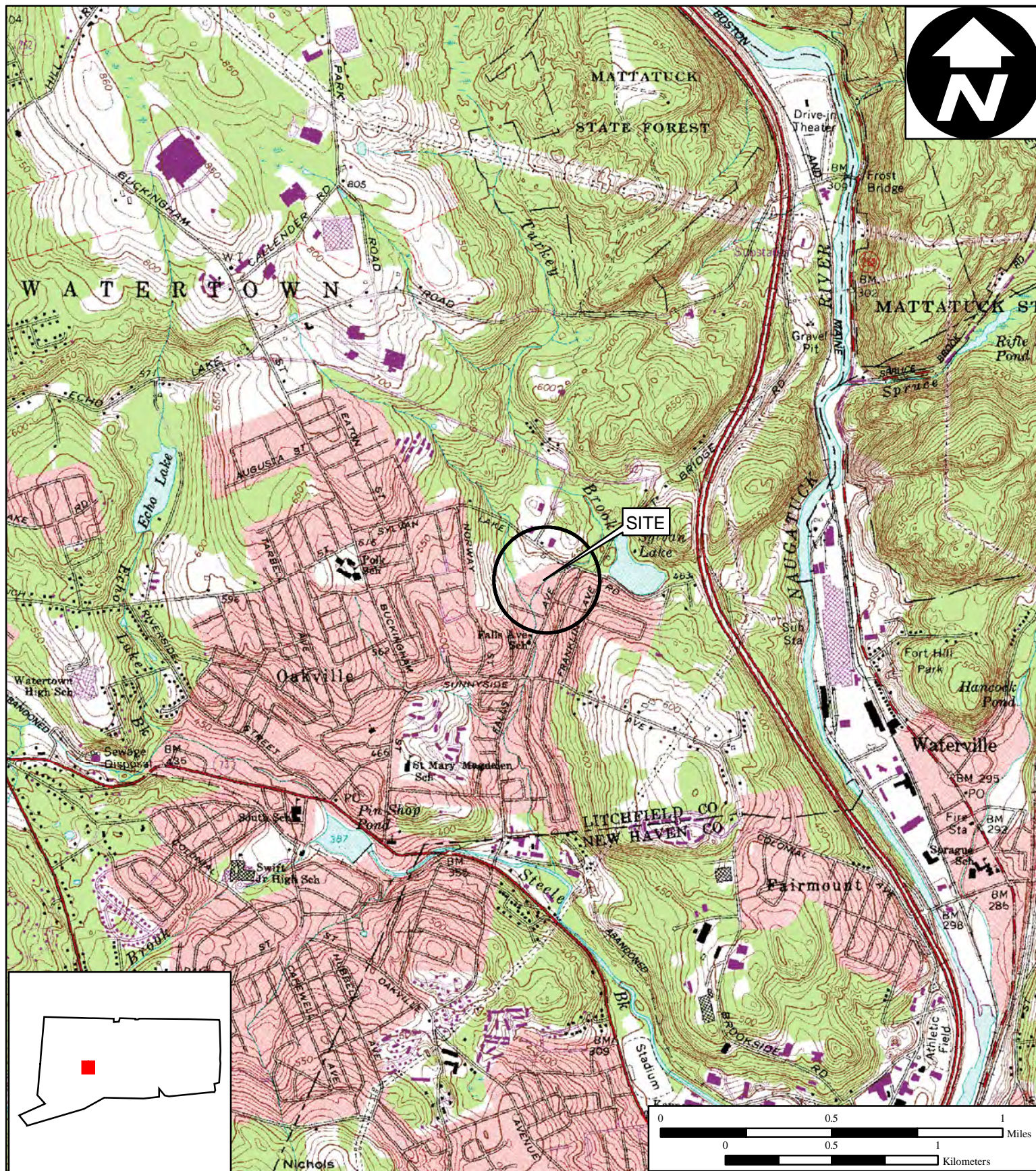
## Appendix A

### Figures

- Figure 1 - Site Location Map
- Figure 2 - Site Diagram and Soil Boring Location Map
- Figure 3 - Boring and Monitoring Well Location Map

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**Figure 1**

**Site Location Map**

**Turkey Brook Site  
20 McLennan Drive  
Oakville, Connecticut**

**EPA Region I  
Superfund Technical Assessment and  
Response Team (START) III  
Contract No. EP-W-05-042**

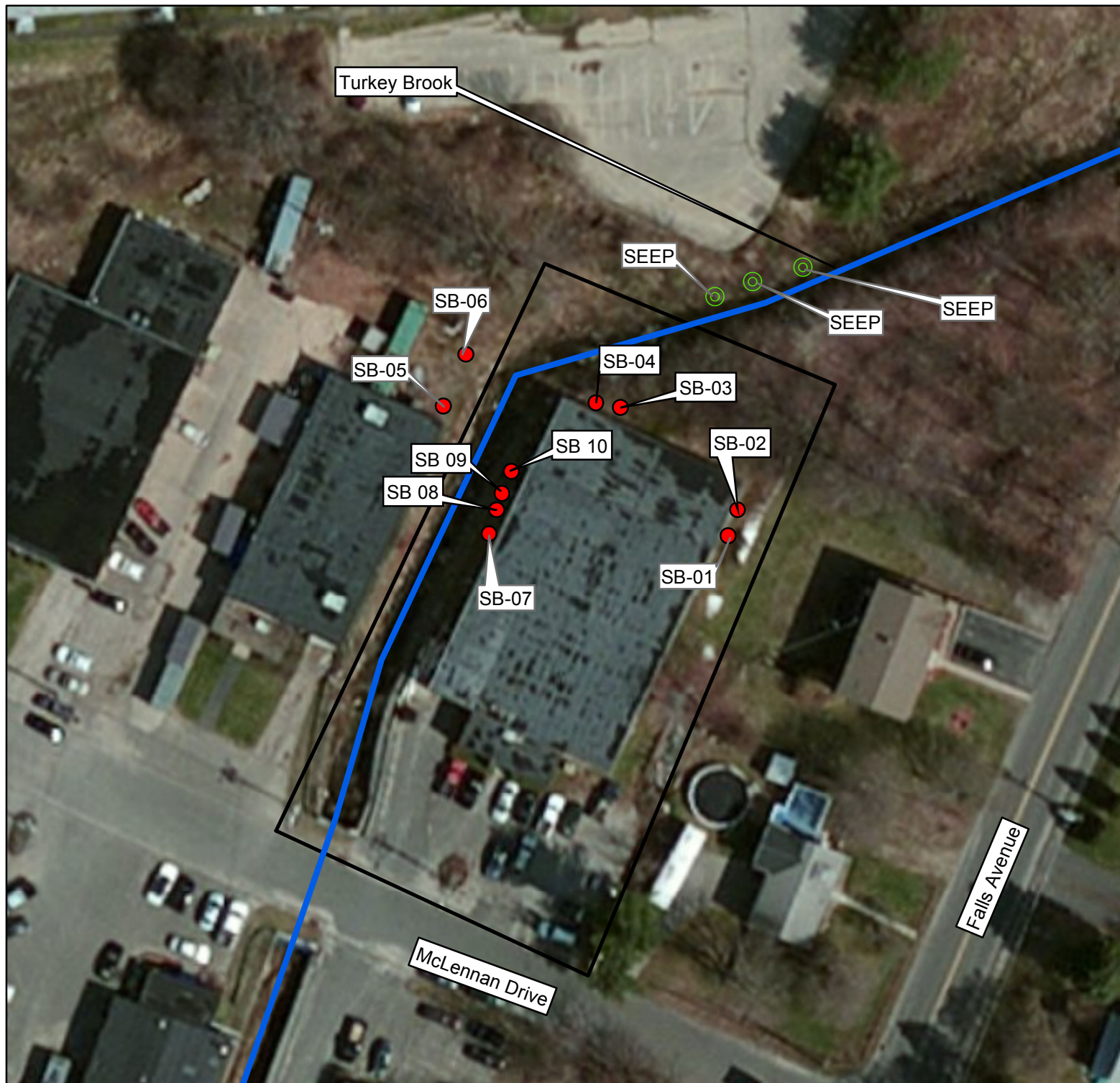
**TDD Number:** 13-09-0009  
**Created by:** B. Mace  
**Created on:** 11 November 2013  
**Modified by:**  
**Modified on:**

**Data Sources:**

Topos: MicroPath/USGS  
Quadrangle Name: Waterbury, CT  
All other data: START







**Figure 2**  
**Site Diagram and Soil Boring**  
**Location Map**

**Turkey Brook Site**  
**20 McLennan Drive**  
**Oakville, Connecticut**

**EPA Region I**  
**Superfund Technical Assessment and**  
**Response Team (START) III**  
**Contract No. EP-W-05-042**  
**TDD Number:** 13-09-0009  
**Created by:** B. Mace  
**Created on:** 11 November 2013  
**Modified by:**  
**Modified on:**

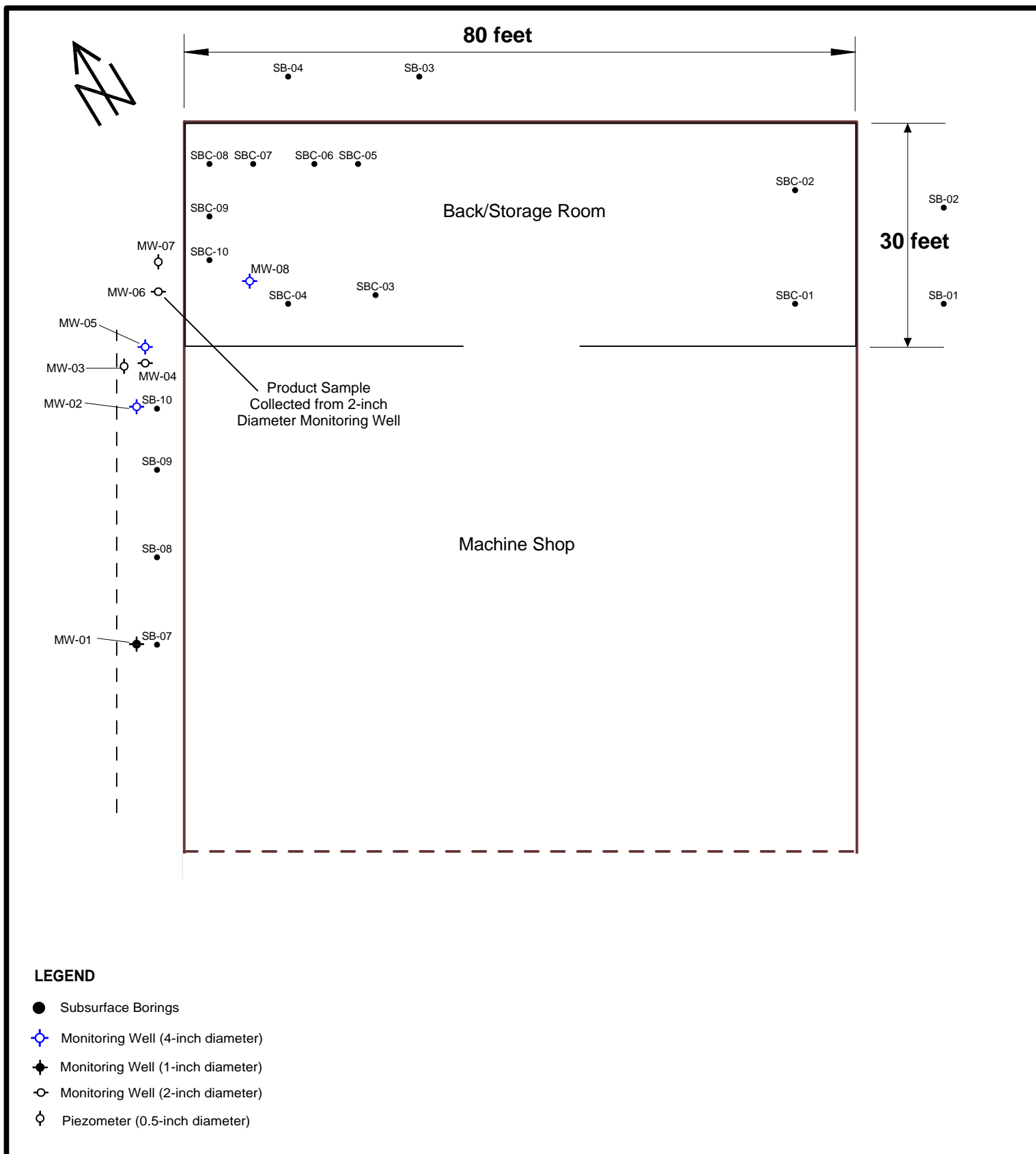
**Legend**

- Turkey Brook
- Soil Boring Location
- Approximate Site Boundary
- ⊙ Seep Location



**Data Sources:**  
 Imagery: Esri, i-cubed, USDA, USGS, AEX,  
 GeoEye, Getmapping, Aerogrid, IGN, IGP  
 Topos: MicroPath  
 All other data: START





**Figure 3**

**Boring and Monitoring  
Well Location Map  
Turkey Brook Site  
Oakville, Connecticut**

EPA Region I  
Superfund Technical Assessment  
and Response Team (START III)  
Contract No. EP-W-05-042

TDD No.: 01-13-09-0009/0912  
Created by: George Mavris  
Created on: 11 December 2013  
Modified by: George Mavris  
Modified on: 6 March 2014

Data Sources:  
SURFER Ver 8



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## Appendix B

### Data Summary Tables

Table 1 - Summary of TPH Results

Table 2 - Summary of Monitoring Well Data

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**TABLE 1**  
**SUMMARY OF TPH RESULTS**  
**TURKEY BROOK SITE**  
**OAKVILLE, CONNECTICUT**

Sample No.	Sample Depth	Lab No.	Petroleum TPH (C9 - C36) mg/kg	Comment
SB-01	4-8 ft	D31846	300	Sample contamination matches reference standards for mineral spirits and motor oil.
SB-02	0-4 ft	D31845	190	Sample contamination consists of heavy residual hydrocarbons similar to asphalt. Chromatogram also shows the presence of PAHs.
SB-03	4-8 ft	D31844	<8.7	None.
SB-04	4-8 ft	D31843	170	Sample contamination consists of heavy residual hydrocarbons similar to asphalt. Chromatogram also shows the presence of PAHs.
SB-05	8-12 ft	D31854	<9.5	None.
SB-06	8-12 ft	D31842	<9.2	None.
SB-07	4-6.5 ft	D31841	<8.6	None.
SB-08	8-12 ft	D31848	<9.1	None.
SB-09	4-8 ft	D31849	12,000	Sample contamination matches reference standards for motor oil. The chromatogram also shows the presence of substance that is possibly weathered mineral spirits.
SB-10	4-8 ft	D31850	14,000	Sample contamination matches reference standards for motor oil. The chromatogram also shows the presence of substance that is possibly weathered mineral spirits.
SB-104	4-8 ft	D31847	180	Sample contamination consists of heavy residual hydrocarbons similar to asphalt. Chromatogram also shows the presence of PAHs.
SBC-02	0-4 ft	D31840	410	Sample contamination matches reference standards for motor oil. The chromatogram also shows the presence of substance that is possibly weathered mineral spirits.
SBC-03	0-4 ft	D31851	7,700	Sample contamination matches reference standards for motor oil. The chromatogram also shows the presence of substance that is possibly weathered mineral spirits.
SBC-04	0-4 ft	D31852	2,400	Sample contamination matches reference standards for motor oil. The chromatogram also shows the presence of substance that is possibly weathered mineral spirits.
SBC-05	0-4 ft	D31853	210	None.
SBC-06	0-4 ft	D31839	11,000	Sample contamination matches reference standards for motor oil. The chromatogram also shows the presence of substance that is possibly weathered mineral spirits.
SBC-07	0-4 ft	D31835	53	Sample contamination consists of heavy residual hydrocarbons similar to asphalt. Chromatogram also shows the presence of PAHs.
SBC-08	0-4 ft	D31838	17,000	Sample contamination matches reference standards for motor oil. The chromatogram also shows the presence of substance that is possibly weathered mineral spirits.
SBC-09	0-4 ft	D31836	21,000	Sample contamination matches reference standards for motor oil. The chromatogram also shows the presence of substance that is possibly weathered mineral spirits.
SBC-10	0-4 ft	D31837	15,000	Sample contamination matches reference standards for motor oil. The chromatogram also shows the presence of substance that is possibly weathered mineral spirits.

mg/Kg = milligrams per Kilogram

TPH = Total Petroleum Hydrocarbons

PAH = Polycyclic Aromatic Hydrocarbons

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**TABLE 2**  
**SUMMARY OF MONITORING WELL DATA**  
**TURKEY BROOK SITE**  
**OAKVILLE, CONNECTICUT**  
**NOVEMBER 22, 2013**

Monitoring Well	Diameter of Inner Casing (in)	Total Depth (ft)	Depth to Water (ft)	Depth to Oil (ft)	Oil/Water Interface (ft)	Oil Thickness (ft)	Comments
MW-01	1	12.3	7.75	NA <sup>2</sup>	NA <sup>2</sup>	NA <sup>2</sup>	No oil/product detected.
MW-02	4	17.2	9.94	NA <sup>2</sup>	NA <sup>2</sup>	NA <sup>2</sup>	See Footnote No. 1 below.
MW-03	0.5	-----	-----	-----	-----	-----	Piezometer.
MW-04	2	13.1	NA <sup>1</sup>	9.53	9.55	0.02	See Footnote No. 2 below.
MW-05	4	15.3	NA <sup>1</sup>	9.03	10.85	1.82	Former recovery well with protective casing.
MW-06	2	14.8	NA <sup>1</sup>	6.60	11.00	4.4	See Footnote No. 2 below.
MW-07	0.5	-----	-----	-----	-----	-----	Piezometer.
MW-08	4	9	3.5	NA <sup>2</sup>	NA <sup>2</sup>	NA <sup>2</sup>	Recovery well, located inside QAI Building.

in = inches

ft = feet

**Notes**

Reference point for measurements = top of polyvinyl chloride (PVC) riser.

----- Not measured; oil/water interface probe did not fit into small diameter casing.

NA<sup>1</sup> Not applicable; oil/product on top of water column.

NA<sup>2</sup> Not applicable; oil not detected in well.

1 Oil/water interface probe did not record oil in the well; however, a petroleum odor was noticeable and the oil/water interface probe was tainted yellow. A disposable bailer was used to obtain liquid from the well; and upon examination the liquid in the well was clear, but appeared to be emulsion-like.

2 Oil/water interface probe recorded very thin layer of oil. Petroleum odor was noticeable. A disposable bailer was used to obtain liquid from the well, and upon examination the liquid in the well was brown.

3 Collected sample for volatile organic compound (VOC), polychlorinated biphenyl (PCB), Metals, and Oil Identification (ID) analyses.

4 Water level measured in MW-08 on 19 February 2014.

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## Appendix C

### Photodocumentation Log

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**PHOTODOCUMENTATION LOG SHEET**  
**Turkey Brook Site • Oakville, Connecticut**



**SCENE:** View of west side of Quality Automatics, Inc. building, vent pipe, and staged 55-gallon drums. Photograph taken facing southwest.

**DATE:** 9 October 2013

**PHOTOGRAPHER:** George Mavris

**TIME:** 1049 hours

**CAMERA:** iPhone 4S



**SCENE:** View of monitoring wells, T-shaped pipe, and 55-gallon drums located on west side of Quality Automatics, Inc. building. Photograph taken facing northeast.

**DATE:** 9 October 2013

**PHOTOGRAPHER:** George Mavris

**TIME:** 1049 hours

**CAMERA:** iPhone 4S



**PHOTODOCUMENTATION LOG SHEET**  
**Turkey Brook Site • Oakville, Connecticut**



**SCENE:** View of piezometer and monitoring well located on west side of Quality Automatics, Inc. building. Photograph taken facing northeast.

**DATE:** 9 October 2013

**PHOTOGRAPHER:** George Mavris

**TIME:** 1050 hours

**CAMERA:** iPhone 4S



**SCENE:** View of grassy area along west side of Quality Automatics, Inc. building. Photograph taken facing southwest.

**DATE:** 9 October 2013

**PHOTOGRAPHER:** George Mavris

**TIME:** 1050 hours

**CAMERA:** iPhone 4S



**PHOTODOCUMENTATION LOG SHEET**  
**Turkey Brook Site • Oakville, Connecticut**



**SCENE:** View of T-shaped pipe and 2-inch monitoring well located on the ground surface along the northwestern side of the Quality Automatics, Inc. building. Photograph taken facing northwest.

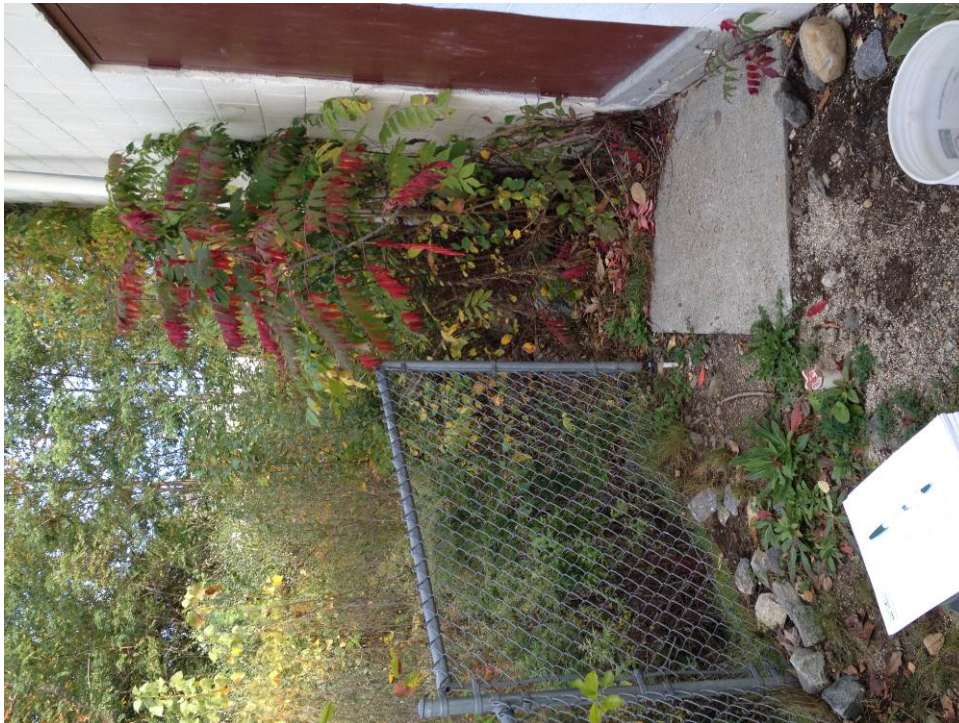
**DATE:** 9 October 2013

**PHOTOGRAPHER:** George Mavris

**TIME:** 1054 hours

**CAMERA:** iPhone 4S

TOP →



**SCENE:** View of 2-inch and 0.5-inch monitoring wells located left of concrete pad and directly in front of back door to the Quality Automatics, Inc. building. Photograph taken facing northeast.

**DATE:** 9 October 2013

**PHOTOGRAPHER:** George Mavris

**TIME:** 1054 hours

**CAMERA:** iPhone 4S



**PHOTODOCUMENTATION LOG SHEET**  
**Turkey Brook Site • Oakville, Connecticut**



**SCENE:** View of gabions along east bank of Turkey Brook adjacent to Quality Automatics, Inc. building. Photograph taken facing northwest.

**DATE:** 9 October 2013

**PHOTOGRAPHER:** George Mavris

**TIME:** 1050 hours

**CAMERA:** iPhone 4S



**SCENE:** View of oil absorbent boom located in Turkey Brook and upstream of monitoring wells on the Quality Automatics, Inc. property. Photograph taken facing northeast.

**DATE:** 9 October 2013

**PHOTOGRAPHER:** George Mavris

**TIME:** 1052 hours

**CAMERA:** iPhone 4S



**PHOTODOCUMENTATION LOG SHEET**  
**Turkey Brook Site • Oakville, Connecticut**



**SCENE:** View of oil absorbent boom located in Turkey Brook and upstream of monitoring wells on the Quality Automatics, Inc. property. Photograph taken facing northeast.

**DATE:** 9 October 2013

**PHOTOGRAPHER:** George Mavris

**TIME:** 1053 hours

**CAMERA:** iPhone 4S



**SCENE:** View of back door of Quality Automatics, Inc. building leading outside to location of monitoring wells, and a solvent tank. Photograph taken facing northwest.

**DATE:** 9 October 2013

**PHOTOGRAPHER:** George Mavris

**TIME:** 1057 hours

**CAMERA:** iPhone 4S

**PHOTODOCUMENTATION LOG SHEET**  
**Turkey Brook Site • Oakville, Connecticut**



**SCENE:** View of northwest corner of Quality Automatics, Inc. building. Photograph taken facing northwest.

**DATE:** 9 October 2013

**PHOTOGRAPHER:** George Mavris

**TIME:** 1057 hours

**CAMERA:** iPhone 4S



**SCENE:** View of back (northern) section of Quality Automatics, Inc. building. Photograph taken facing southeast.

**DATE:** 9 October 2013

**PHOTOGRAPHER:** George Mavris

**TIME:** 1057 hours

**CAMERA:** iPhone 4S



**PHOTODOCUMENTATION LOG SHEET**  
**Turkey Brook Site • Oakville, Connecticut**



**SCENE:** View of large aboveground storage tank located in northwest section of the machine shop in the Quality Automatics, Inc. building. Photograph taken facing northwest.

**DATE:** 9 October 2013

**PHOTOGRAPHER:** George Mavris

**TIME:** 1058 hours

**CAMERA:** iPhone 4S



**SCENE:** View of 275-gallon aboveground storage tank located in southwest section of the machine shop in the Quality Automatics, Inc. building. Photograph taken facing southeast.

**DATE:** 9 October 2013

**PHOTOGRAPHER:** George Mavris

**TIME:** 1101 hours

**CAMERA:** iPhone 4S

**PHOTODOCUMENTATION LOG SHEET**  
**Turkey Brook Site • Oakville, Connecticut**

TOP→



**SCENE:** View of western side of machine shop in the Quality Automatics, Inc. building. Photograph taken facing southwest.

**DATE:** 9 October 2013

**PHOTOGRAPHER:** George Mavris

**TIME:** 1058 hours

**CAMERA:** iPhone 4S



**SCENE:** View of right-center aisle of machine shop in the Quality Automatics, Inc. building. Photograph taken facing southwest.

**DATE:** 9 October 2013

**PHOTOGRAPHER:** George Mavris

**TIME:** 1059 hours

**CAMERA:** iPhone 4S



**PHOTODOCUMENTATION LOG SHEET**  
**Turkey Brook Site • Oakville, Connecticut**



**SCENE:** View of left-center aisle of machine shop in the Quality Automatics, Inc. building. Photograph taken facing southwest.

**DATE:** 9 October 2013

**PHOTOGRAPHER:** George Mavris

**TIME:** 1059 hours

**CAMERA:** iPhone 4S



**SCENE:** View of eastern aisle of machine shop in the Quality Automatics, Inc. building. Photograph taken facing southwest.

**DATE:** 9 October 2013

**PHOTOGRAPHER:** George Mavris

**TIME:** 1059 hours

**CAMERA:** iPhone 4S



**PHOTODOCUMENTATION LOG SHEET**  
**Turkey Brook Site • Oakville, Connecticut**

TOP→



**SCENE:** View through doorway leading into northern room of Quality Automatics, Inc. building. Photograph taken facing northeast.

**DATE:** 9 October 2013

**PHOTOGRAPHER:** George Mavris

**TIME:** 1059 hours

**CAMERA:** iPhone 4S



**SCENE:** Upstream view of Turkey Brook from McLellan Drive. Photograph taken facing northeast.

**DATE:** 9 October 2013

**PHOTOGRAPHER:** George Mavris

**TIME:** 1133 hours

**CAMERA:** iPhone 4S



**PHOTODOCUMENTATION LOG SHEET**  
**Turkey Brook Site • Oakville, Connecticut**



**SCENE:** View of sheen on Turkey Brook upstream of oil absorbent boom and north of McLellan Drive. Photograph taken facing northeast.

**DATE:** 9 October 2013

**PHOTOGRAPHER:** George Mavris

**TIME:** 1134 hours

**CAMERA:** iPhone 4S



**SCENE:** View of gabion reinforcing eastern bank of Turkey Brook adjacent to the Quality Automatics, Inc. building. Photograph taken facing northeast.

**DATE:** 9 October 2013

**PHOTOGRAPHER:** George Mavris

**TIME:** 1134 hours

**CAMERA:** iPhone 4S



**PHOTODOCUMENTATION LOG SHEET**  
**Turkey Brook Site • Oakville, Connecticut**



**SCENE:** View of stacked gabions along eastern bank of Turkey Brook adjacent to the Quality Automatics, Inc. building. Photograph taken facing northwest.

**DATE:** 9 October 2013

**PHOTOGRAPHER:** George Mavris

**TIME:** 1134 hours

**CAMERA:** iPhone 4S



TOP→

**SCENE:** View of monitoring (number unknown) located in front of bay door of Quality Automatics, Inc. building. Photograph taken facing northeast.

**DATE:** 9 October 2013

**PHOTOGRAPHER:** George Mavris

**TIME:** 1136 hours

**CAMERA:** iPhone 4S



**PHOTODOCUMENTATION LOG SHEET**  
**Turkey Brook Site • Oakville, Connecticut**



**SCENE:** View of Rintec Corporation Building located along west side of Turkey Brook and adjacent to Quality Automatics, Inc. Photograph taken facing northwest.

**DATE:** 9 October 2013

**PHOTOGRAPHER:** George Mavris

**TIME:** 1212 hours

**CAMERA:** iPhone 4S



**SCENE:** View of eastern side of Quality Automatics, Inc. building. Photograph taken facing northeast.

**DATE:** 9 October 2013

**PHOTOGRAPHER:** George Mavris

**TIME:** 1210 hours

**CAMERA:** iPhone 4S



**PHOTODOCUMENTATION LOG SHEET**  
**Turkey Brook Site • Oakville, Connecticut**



**SCENE:** View of 18 55-gallon drums containing used oil absorbent booms, located at southwestern corner of Quality Automatics, Inc. building. Photograph taken facing southwest.

**DATE:** 9 October 2013

**PHOTOGRAPHER:** George Mavris

**TIME:** 1212 hours

**CAMERA:** iPhone 4S



**SCENE:** View of gas line markings in parking lot of Quality Automatics, Inc. Photograph taken facing northeast.

**DATE:** 9 October 2013

**PHOTOGRAPHER:** George Mavris

**TIME:** 1137 hours

**CAMERA:** iPhone 4S



**PHOTODOCUMENTATION LOG SHEET**  
**Turkey Brook Site • Oakville, Connecticut**



**SCENE:** View of two catchbasins located directly above Turkey Brook along McLellan Drive. Photograph taken facing northeast.

**DATE:** 9 October 2013

**PHOTOGRAPHER:** George Mavris

**TIME:** 1144 hours

**CAMERA:** iPhone 4S



**SCENE:** View of blue and black pipes crossing Turkey Brook along southern side of McLellan Drive. Photograph taken facing northwest.

**DATE:** 9 October 2013

**PHOTOGRAPHER:** George Mavris

**TIME:** 1144 hours

**CAMERA:** iPhone 4S



**PHOTODOCUMENTATION LOG SHEET**  
**Turkey Brook Site • Oakville, Connecticut**



**SCENE:** View of blue and black pipes crossing Turkey Brook and surface water flowing along concrete wall adjacent to the Quality Automatics, Inc. facility located on south side of McLellan Drive. Photograph taken facing southwest.

**DATE:** 9 October 2013

**TIME:** 1147 hours

**PHOTOGRAPHER:** George Mavris

**CAMERA:** iPhone 4S



**SCENE:** View of Quality Automatics, Inc. facility located on south side of McLellan Drive (15 McClellan Drive). Photograph taken facing southwest.

**DATE:** 9 October 2013

**TIME:** 1132 hours

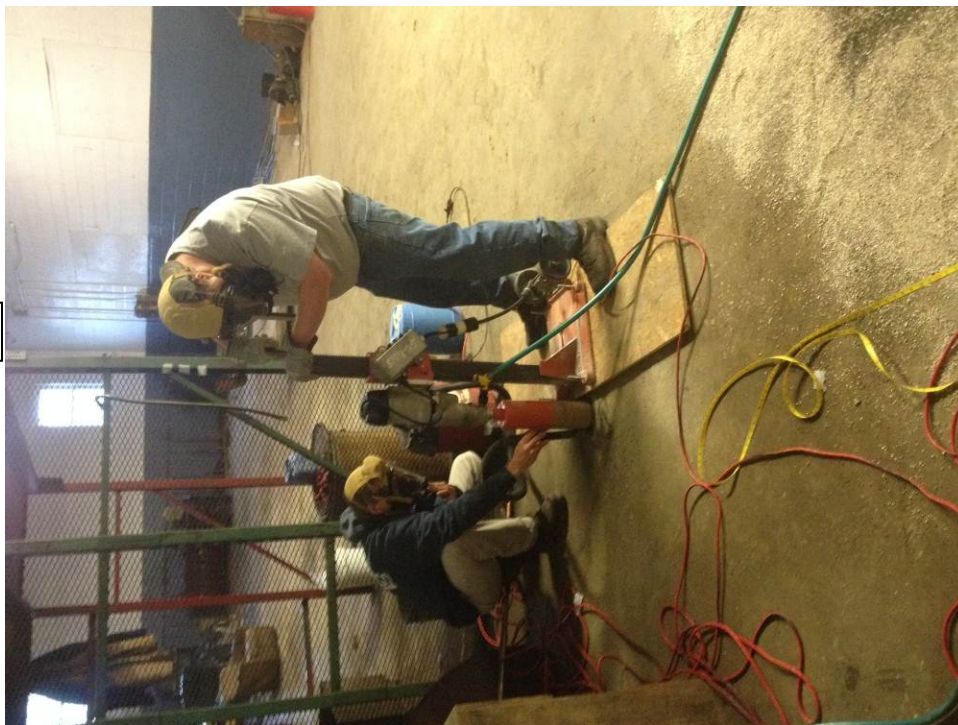
**PHOTOGRAPHER:** George Mavris

**CAMERA:** iPhone 4S



**PHOTODOCUMENTATION LOG SHEET**  
**Turkey Brook Site • Oakville, Connecticut**

TOP →



**SCENE:** View of personnel completing a soil boring inside the Quality Automatics, Inc. building (20 McClellan Drive).

**DATE:** 21 November 2013

**PHOTOGRAPHER:** Colin Cardin

**TIME:** 0758 hours

**CAMERA:** iPhone 4S



**SCENE:** View of soil boring locations SB-03 and SB-04 located on the northern side of the Quality Automatics, Inc. building (20 McClellan Drive). Photograph taken facing west.

**DATE:** 21 November 2013

**PHOTOGRAPHER:** George Mavris

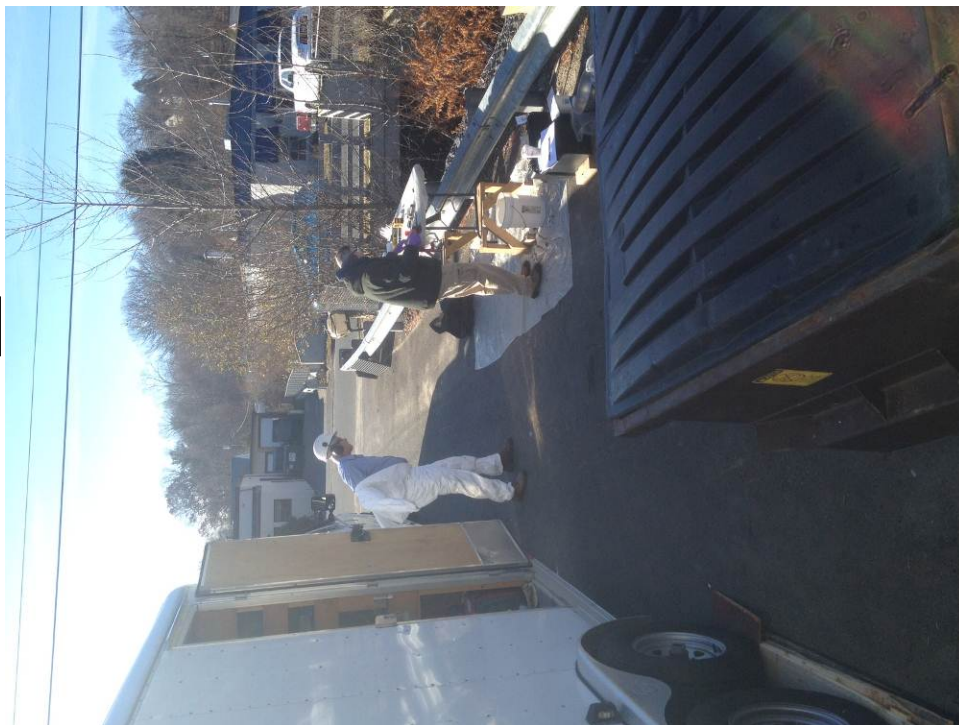
**TIME:** 0826 hours

**CAMERA:** iPhone 4S



**PHOTODOCUMENTATION LOG SHEET**  
**Turkey Brook Site • Oakville, Connecticut**

TOP →



**SCENE:** View of the soil classification area.

**DATE:** 21 November 2013

**PHOTOGRAPHER:** Colin Cardin

**TIME:** 1002 hours

**CAMERA:** iPhone 4S



**SCENE:** View of soil boring location SBC-03 located inside of the Quality Automatics, Inc. building. Photograph taken facing south.

**DATE:** 22 November 2013

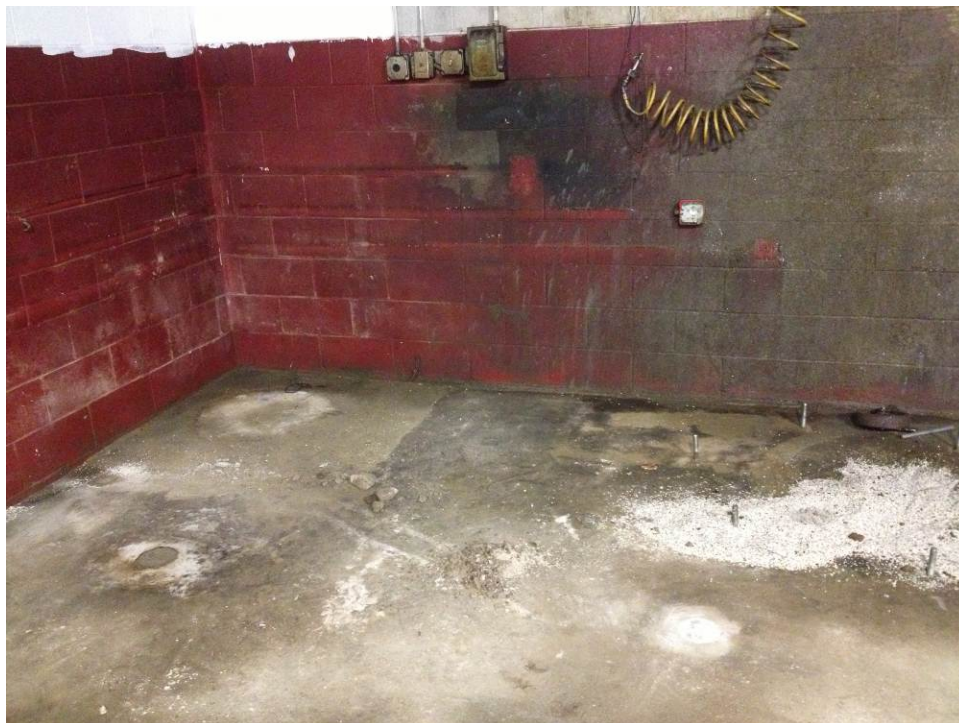
**PHOTOGRAPHER:** George Mavris

**TIME:** 0739 hours

**CAMERA:** iPhone 4S



**PHOTODOCUMENTATION LOG SHEET**  
**Turkey Brook Site • Oakville, Connecticut**



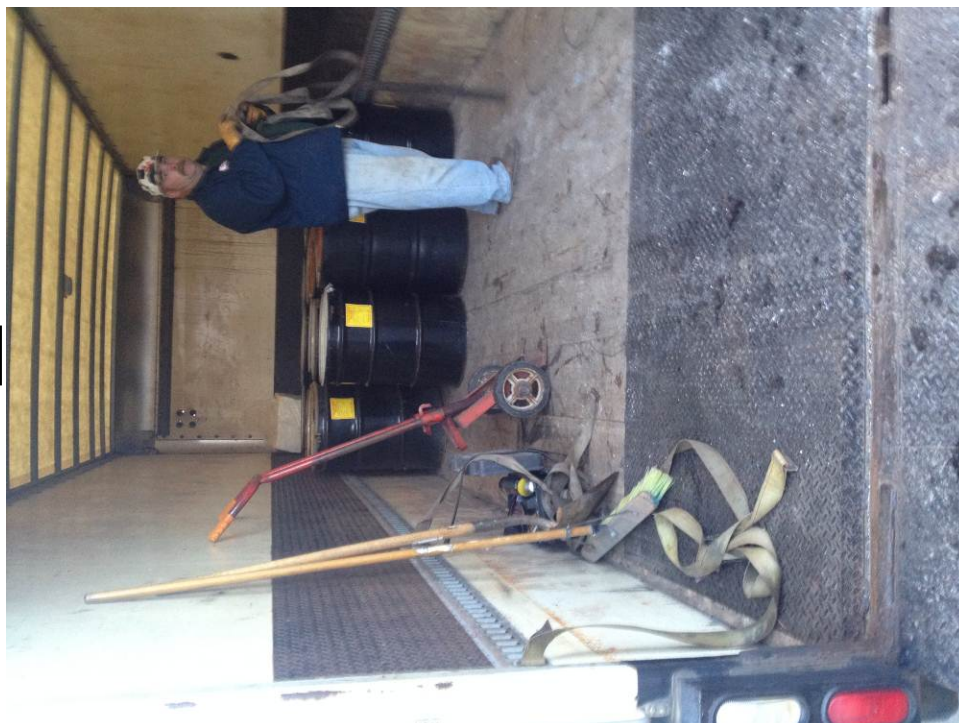
**SCENE:** View of soil boring locations SBC-07 and SBC-08, located inside of the Quality Automatics, Inc. building.  
Photograph taken facing north.

**DATE:** 22 November 2013

**PHOTOGRAPHER:** George Mavris

**TIME:** 0740 hours

**CAMERA:** iPhone 4S



**SCENE:** View of the loaded drums containing petroleum waste being secured for transportation to the disposal facility.

**DATE:** 25 November 2013

**PHOTOGRAPHER:** George Mavris

**TIME:** 1606 hours

**CAMERA:** iPhone 4S



**PHOTODOCUMENTATION LOG SHEET**  
**Turkey Brook Site • Oakville, Connecticut**



**SCENE:** View of a T-shaped polyvinyl chloride (PVC) pipe located on the western side of the Quality Automatics, Inc. building.

**DATE:** 8 January 2014

**PHOTOGRAPHER:** Robert Sharp

**TIME:** 0818 hours

**CAMERA:** iPhone 4S



**SCENE:** View of product and water being bailed out of the on-site monitoring wells to observe the recharge rate of the wells.

**DATE:** 8 January 2014

**PHOTOGRAPHER:** Robert Sharp

**TIME:** 1044 hours

**CAMERA:** iPhone 4S



**PHOTODOCUMENTATION LOG SHEET**  
**Turkey Brook Site • Oakville, Connecticut**



**SCENE:** View of the GeoTech SpOILer Controless Recovery Pump being installed into monitoring well MW-6.

**DATE:** 9 January 2014

**PHOTOGRAPHER:** Robert Sharp

**TIME:** 0921 hours

**CAMERA:** iPhone 4S



**SCENE:** View of the GeoTech SpOILer Controless Recovery Pump being installed into monitoring well MW-05.

**DATE:** 9 January 2014

**PHOTOGRAPHER:** Robert Sharp

**TIME:** 1014 hours

**CAMERA:** iPhone 4S

**PHOTODOCUMENTATION LOG SHEET**  
**Turkey Brook Site • Oakville, Connecticut**



**SCENE:** View of personnel inspecting areas on northern banks of Turkey Brook, upstream of the spill area at the Quality Automatics, Inc. building.

**DATE:** 9 January 2014

**PHOTOGRAPHER:** Robert Sharp

**TIME:** 1056 hours

**CAMERA:** iPhone 4S



**SCENE:** View of the drill rig staged and being prepared to advance borings inside the Quality Automatics, Inc. building.

**DATE:** 18 February 2014

**PHOTOGRAPHER:** Ken Robinson

**TIME:** 1121 hours

**CAMERA:** iPhone

## Appendix D

### Chain-of-Custody Records

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## CHAIN OF CUSTODY RECORD

### Turkey Brook

Contact Name:

Contact Phone:

No: 11/22/13-0002

Cooler #:

Lab: Contest Laboratory

Lab Phone:

Lab #	DAS Number	Sample #	Location	Analyses	Matrix	Collected	Sample Time	Numb Cont	Container	Preservative	MS/MS D
	D31835	13090009-0002	SBC-07	Oil ID	Soil	11/22/2013	08:00	1	4 oz jar		
	D31836	13090009-0003	SBC-09	Oil ID	Soil	11/22/2013	08:25	1	4 oz jar		
	D31837	13090009-0004	SBC-10	Oil ID	Soil	11/22/2013	08:35	1	4 oz jar		
	D31838	13090009-0005	SBC-08	Oil ID	Soil	11/22/2013	08:15	1	4 oz jar		
	D31839	13090009-0006	SBC-06	Oil ID	Soil	11/21/2013	14:05	1	4 oz jar		
	D31840	13090009-0007	SBC-02	Oil ID	Soil	11/20/2013	14:00	1	4 oz jar		
	D31841	13090009-0008	SB-07	Oil ID	Soil	11/21/2013	10:50	1	4 oz jar		
	D31842	13090009-0009	SB-06	Oil ID	Soil	11/21/2013	15:00	1	4 oz jar		
	D31843	13090009-0010	SB-04	Oil ID	Soil	11/20/2013	15:20	1	4 oz jar		
	D31844	13090009-0011	SB-03	Oil ID	Soil	11/20/2013	13:40	1	4 oz jar		
	D31845	13090009-0012	SB-02	Oil ID	Soil	11/20/2013	12:20	1	4 oz jar		
	D31846	13090009-0013	SB-01	Oil ID	Soil	11/20/2013	10:50	1	4 oz jar		
	D31847	13090009-0014	SB-104	Oil ID	Soil	11/20/2013	15:20	1	4 oz jar		
	D31848	13090009-0015	SB-08	Oil ID	Soil	11/21/2013	11:15	1	4 oz jar		
	D31849	13090009-0016	SB-09	Oil ID	Soil	11/21/2013	11:25	1	4 oz jar		
	D31850	13090009-0017	SB-10	Oil ID	Soil	11/21/2013	15:40	1	4 oz jar		
	D31851	13090009-0018	SBC-03	Oil ID	Soil	11/21/2013	09:20	1	4 oz jar		
	D31852	13090009-0019	SBC-04	Oil ID	Soil	11/21/2013	09:40	1	4 oz jar		
	D31853	13090009-0020	SBC-05	Oil ID	Soil	11/21/2013	13:50	1	4 oz jar		

Special Instructions:	SAMPLES TRANSFERRED FROM
	CHAIN OF CUSTODY #

[illegible]

### CHAIN OF CUSTODY RECORD

Turkey Brook

Contact Name:

Contact Phone:

No: 11/22/13-0002

Cooler #:

Lab: Contest Laboratory

Lab Phone:

[illegible]

Special Instructions:

SAMPLES TRANSFERRED FROM	
1	2
3	4
5	6
7	8
9	10
11	12
13	14
15	16
17	18
19	20
21	22
23	24
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CHAIN OF CUSTODY #

[illegible]



## CHAIN OF CUSTODY RECORD

## Turkey Brook

Contact Name: Mia Pasquerella

Contact Phone: 6179181120

No: 11/22/13-0001

Cooler #:

Lab: US EPA NERL

Lab Phone:

[illegible]

Special Instructions: Please forward results to OSC Pasquerella and OSC Bazenas

SAMPLES TRANSFERRED FROM	
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CHAIN OF CUSTODY #

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## Appendix E

### Boring Logs/Well Completion Log

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WESTON SOLUTIONS, INC.		SOIL BORING LOG			
Project	Turkey Brook	Boring ID	SB-01	Groundwater Levels	
Location	Oakville, Connecticut	Well ID	NA	Date	Depth
Date Drilled	November 20, 2013	Drilling Method	Direct Push	NA	NA
Drilling Company	U.S. EPA OEME*	Sampling Method	4-ft. Macrocore		
Operator	Jerry Keefe/Dan Granz	Completion Depth	12 feet bgs		
Drill Rig	Geoprobe	Surface Elevation	NA		
Logged by	George Mavris - Weston, Superfund Technical Assessment and Response Team (START)				
Depth (ft bgs)	Macrocore Number	Recovery (inches)	Soil Description (Burmister System)		PID Screen (ppm)**
1_	1	28	0 - 2" Dark brown, fine SAND and SILT, trace roots (topsoil). Moist.		Top = 0 Bottom = 0 Length = 0
2_			2 - 21" Dark brown, fine-to-medium SAND, trace fine gravel (coal-like fragments and metal), silt, and roots. Moist. [Fill].		
3_			21 - 24" Grayish-white, fine GRAVEL, little medium sand. Dry. [Fill].		
4_			24 - 28" Dark brown, fine SAND, trace fine gravel and silt. Moist. [Fill].		
5_	2	34	0 - 1" Grayish-brown, fine SAND, trace fine gravel. Moist. [Fill].		Top = 0 Bottom = 0 Length = 0.6
6_			1 - 5" *** Black, fine SAND, trace silt. PID = 0.6 ppm. No odor. [Fill].		
7_			5 - 20" Reddish-brown and blackish-brown, fine-to-coarse SAND, some coarse-to-fine gravel (SubA), trace silt. Very moist. [Fill].		
8_			20 - 23" Light gray, coarse GRAVEL (SubA, granitic). Dry. [Fill].		
9_	3	46	0 - 6" Brown, fine GRAVEL, some coarse-to-medium sand, trace silt. Very moist. [Fill].		Top = 0 Bottom = 0 Length = 0
10_			6 - 46" Brown, fine-to-medium SAND, little fine gravel, trace silt. Very tight. [Fill].		
11_					
12_					
- End of Boring at 12 feet bgs -					
<div><div><div>Notes:</div><div>bgs = below ground surface</div><div>ft = feet</div><div>ppm = parts per million</div><div>NA = Not Applicable</div><div>SubA = subangular</div><div>PID = Photoionization Detector</div></div><div><div>PROPORTIONS USED</div><div>(BY DRY WEIGHT)</div><div>0 to 10% = Trace</div><div>&gt;10 to 20% = Little</div><div>&gt;20 to 35% = Some</div><div>&gt;35 to 50% = And</div><div>&gt; 50% = Major</div></div></div> <div><div>* United States Environmental Protection Agency, Office of Environmental Measurement and Evaluation</div><div>** MultiRAE Plus Systems multi-gas photoionization detector calibrated to 100 ppm isobutylene, 50 ppm carbon monoxide, 25 ppm hydrogen sulfide, 20.9% oxygen, and 50% methane.</div><div>*** Soil sample SB-01 collected from 1 to 5-inch interval from Macrocore No. 2 (4 - 8 feet). PID = 0.6 ppm.</div></div> <div>Analytical results for Total Petroleum Hydrocarbons (C9 - C36) = 300 milligrams per kilogram (mg/Kg).</div>					

WESTON SOLUTIONS, INC.		SOIL BORING LOG									
Project	Turkey Brook	Boring ID	SB-02	Groundwater Levels							
Location	Oakville, Connecticut	Well ID	NA	Date	Depth						
Date Drilled	November 20, 2013	Drilling Method	Direct Push	NA	NA						
Drilling Company	U.S. EPA OEME*	Sampling Method	4-ft. Macrocore								
Operator	Jerry Keefe/Dan Granz	Completion Depth	6 feet bgs								
Drill Rig	Geoprobe	Surface Elevation	NA								
Logged by	George Mavris - Weston, Superfund Technical Assessment and Response Team (START)										
Depth (ft bgs)	Macrocore Number	Recovery (inches)	Soil Description (Burmister System)		PID Screen (ppm)**						
1_	1	30	0 - 1" Dark brown, fine SAND and SILT, trace roots (topsoil). Moist.		Top = 0 Bottom = 0 Length = 0						
2_			1 - 7" Dark brown, fine SAND, trace fine gravel, roots, and silt. Moist. [Fill].								
3_			7 - 9" Whitish-gray, coarse GRAVEL (SubA, granitic). Dry. [Fill].								
4_			9 - 26" Dark brown, fine SAND and SILT. Moist. [Fill].								
5_	2	22	26 - 30"*** Brownish-black, medium SAND, trace fine gravel and silt.		Top = 0 Bottom = 0 Length = 0						
6_			0 - 12" Grayish-white, coarse-to-fine GRAVEL (SubA), some medium-to-coarse sand, trace silt. Dry. [Fill].								
7_			12 - 22" Rusty-brown, medium SAND, little fine-to-coarse gravel (SubA and SubR). Wet. [Fill].								
8_											
- Refusal at 6 feet bgs -											
<b>Notes:</b> bgs = below ground surface ft = feet ppm = parts per million NA = Not Applicable SubA = subangular SubR = subrounded PID = Photoionization Detector			<table border="1"> <thead> <tr> <th>PROPORTIONS USED (BY DRY WEIGHT)</th> </tr> </thead> <tbody> <tr> <td>0 to 10% = Trace</td> </tr> <tr> <td>&gt;10 to 20% = Little</td> </tr> <tr> <td>&gt;20 to 35% = Some</td> </tr> <tr> <td>&gt;35 to 50% = And</td> </tr> <tr> <td>&gt; 50% = Major</td> </tr> </tbody> </table>			PROPORTIONS USED (BY DRY WEIGHT)	0 to 10% = Trace	>10 to 20% = Little	>20 to 35% = Some	>35 to 50% = And	> 50% = Major
PROPORTIONS USED (BY DRY WEIGHT)											
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>20 to 35% = Some											
>35 to 50% = And											
> 50% = Major											
* United States Environmental Protection Agency, Office of Environmental Measurement and Evaluation ** MultiRAE Plus Systems multi-gas photoionization detector calibrated to 100 ppm isobutylene, 50 ppm carbon monoxide, 25 ppm hydrogen sulfide, 20.9% oxygen, and 50% methane. *** Soil sample SB-02 collected from 26 to 30-inch interval from Macrocore No. 1 (0 - 4 feet). PID = 0 ppm.											
<b>Analytical results for Total Petroleum Hydrocarbons (C9 - C36) = 190 milligrams per kilogram (mg/Kg).</b>											

WESTON SOLUTIONS, INC.			SOIL BORING LOG			
Project	Turkey Brook		Boring ID	SB-03	Groundwater Levels	
Location	Oakville, Connecticut		Well ID	NA	Date	Depth
Date Drilled	November 20, 2013		Drilling Method	Direct Push	NA	NA
Drilling Company	U.S. EPA OEME*		Sampling Method	4-ft. Macrocore		
Operator	Jerry Keefe/Dan Granz		Completion Depth	12 feet bgs		
Drill Rig	Geoprobe		Surface Elevation	NA		
Logged by	George Mavris - Weston, Superfund Technical Assessment and Response Team (START)					
Depth (ft bgs)	Macrocore Number	Recovery (inches)	Soil Description (Burmister System)		PID Screen (ppm)**	
1 2 3 4	1	24	0 - 1" Dark brown, fine SAND and SILT, trace roots (topsoil). Moist. 1 - 24" Brown, fine-to-medium SAND, little coarse-to-fine gravel (SubA and SubR). Moist. [Fill].		Top = 0 Bottom = 0 Length = 0	
5 6 7 8			0 - 7" Grayish-brown, fine SAND and fine-to-coarse GRAVEL (SubR and SubA). Dry. [Fill]. 7 - 15" Light brown, fine SAND, trace coarse-to-fine gravel (SubR) and roots. Dry. [Fill]. 15 - 17" Light brown, fine GRAVEL (SubR). Dry. [Fill]. 17 - 21" Grayish-white, coarse GRAVEL (SubA, granitic), little fine sand. Dry. [Fill]. 21 - 28"*** Brown, coarse-to-medium SAND, some fine-to-coarse gravel (SubA). Wet. [Fill].		Top = 0 Bottom = 0 Length = 0	
9 10 11 12			0 - 13" Light gray, coarse GRAVEL (SubA), little medium-to-coarse sand. Moist. [Fill]. 13 - 36" Light brown, fine-to-medium SAND, trace coarse-to-fine gravel (SubA) and silt. Very moist. [Fill]. 36 - 46" Light brown and black, coarse-to-fine GRAVEL, little fine-to-medium sand. Very moist. [Fill].		Top = 0 Bottom = 0 Length = 0	
- End of Boring at 12 feet bgs -						
<div><div><div>Notes:</div><div>bgs = below ground surface ft = feet ppm = parts per million NA = Not Applicable SubA = subangular SubR = subrounded PID = Photoionization Detector</div></div><div><div>PROPORTIONS USED (BY DRY WEIGHT)</div><div>0 to 10% = Trace &gt;10 to 20% = Little &gt;20 to 35% = Some &gt;35 to 50% = And &gt; 50% = Major</div></div></div> <div><div>* United States Environmental Protection Agency, Office of Environmental Measurement and Evaluation ** MultiRAE Plus Systems multi-gas photoionization detector calibrated to 100 ppm isobutylene, 50 ppm carbon monoxide, 25 ppm hydrogen sulfide, 20.9% oxygen, and 50% methane. *** Soil sample SB-03 collected from 21 to 28-inch interval from Macrocore No. 2 (4 - 8 feet). PID = 0 ppm.</div><div>Analytical results for Total Petroleum Hydrocarbons (C9 - C36) = Non-detect [&lt;8.7 milligrams per kilogram (mg/Kg)].</div></div>						

WESTON SOLUTIONS, INC.			SOIL BORING LOG			
Project	Turkey Brook		Boring ID	SB-04	Groundwater Levels	
Location	Oakville, Connecticut		Well ID	NA	Date	Depth
Date Drilled	November 20, 2013		Drilling Method	Direct Push	NA	NA
Drilling Company	U.S. EPA OEME*		Sampling Method	4-ft. Macrocore		
Operator	Jerry Keefe/Dan Granz		Completion Depth	9.2 feet bgs		
Drill Rig	Geoprobe		Surface Elevation	NA		
Logged by	George Mavris - Weston, Superfund Technical Assessment and Response Team (START)					
Depth (ft bgs)	Macrocore Number	Recovery (inches)	Soil Description (Burmister System)		PID Screen (ppm)**	
1 2 3 4	1	24	0 - 2" Dark brown, fine SAND and SILT, trace roots (topsoil). Moist. 2 - 11" Dark brown, fine SAND, trace fine gravel and silt. Moist. [Fill]. 11 - 24" Brown, fine-to-medium SAND, trace silt and roots. Moist. [Fill].		Top = 0 Bottom = 0 Length = 0	
5 6 7 8	2	28	0 - 7" *** Brown, medium SAND, trace fine gravel, silt, and roots. Moist. [Fill]. 7 - 17" Light gray, coarse GRAVEL (SubA, granitic and gneissic), little coarse-to-very coarse sand. Dry. [Fill]. 17 - 28" Brown, fine-to-medium SAND, little coarse-to-fine gravel (SubR), trace silt. Wet. [Fill].		Top = 0 Bottom = 0 Length = 0	
9 10 11 12	3	16	0 - 16" Brown, fine-to-medium SAND, trace fine gravel and silt. Very moist. [Fill].  - Refusal at 9.2 feet bgs -		Top = 0 Bottom = 0 Length = 0	
<div><div><div>Notes:</div><div>bgs = below ground surface ft = feet ppm = parts per million NA = Not Applicable SubA = subangular SubR = subrounded PID = Photoionization Detector</div></div><div><div>PROPORTIONS USED (BY DRY WEIGHT)</div><div>0 to 10% = Trace &gt;10 to 20% = Little &gt;20 to 35% = Some &gt;35 to 50% = And &gt; 50% = Major</div></div></div> <div><div>* United States Environmental Protection Agency, Office of Environmental Measurement and Evaluation</div><div>** MultiRAE Plus Systems multi-gas photoionization detector calibrated to 100 ppm isobutylene, 50 ppm carbon monoxide, 25 ppm hydrogen sulfide, 20.9% oxygen, and 50% methane.</div><div>*** Soil sample SB-04 collected from 0 to 7-inch interval from Macrocore No. 2 (4 - 8 feet). Duplicate sample SB-104 collected from same interval. PID = 0 ppm.</div><div>Analytical results for Total Petroleum Hydrocarbons (C9 - C36) = 180 milligrams per kilogram (mg/Kg).</div></div>						



WESTON SOLUTIONS, INC.			SOIL BORING LOG			
Project	Turkey Brook		Boring ID	SB-05	Groundwater Levels	
Location	Oakville, Connecticut		Well ID	NA	Date	Depth
Date Drilled	November 21, 2013		Drilling Method	Direct Push	NA	NA
Drilling Company	U.S. EPA OEME*		Sampling Method	4-ft. Macrocore		
Operator	Jerry Keefe/Dan Granz		Completion Depth	12 feet bgs		
Drill Rig	Geoprobe		Surface Elevation	NA		
Logged by	George Mavris - Weston, Superfund Technical Assessment and Response Team (START)					
Depth (ft bgs)	Macrocore Number	Recovery (inches)	Soil Description (Burmister System)			PID Screen (ppm)**
1_	1	34	0 - 3" Dark brown, fine SAND and SILT, trace roots (topsoil). Moist.			Top = 0.1 Bottom = 0 Length = 0.1
2_			3 - 34" Copper brown, coarse-to-medium SAND, little coarse-to-fine gravel (SubA, granitic and gneissic), trace silt. Moist [Fill].			
3_						
4_						
5_	2	44	0 - 13" Copper brown, coarse-to-medium SAND, trace fine-to-coarse gravel (SubR) and silt. Moist [Fill].			Top = 0.1 Bottom = 0 Length = 0.1
6_			13 - 15" Black, coarse GRAVEL (SubA, gneissic). Dry. [Fill].			
7_			15 - 19" Same as 0 - 13-inch interval.			
8_			19 - 21" Whitish-gray, coarse GRAVEL and COBBLES (SubA). Dry. [Fill].			
			21 - 35" Reddish-brown, medium-to-fine SAND, trace silt. Moist. [Fill].			
			35 - 44" Olive-gray, fine SAND, trace fine gravel and silt. Moist. [Fill].			
9_	3	41	0 - 16"*** Brown, coarse-to-medium SAND, trace fine gravel and silt. Wet.			Top = 0.1 Bottom = 0 Length = 0.1
10_			16 - 21" Brown, fine SAND, little silt. Wet.			
11_			21 - 41" Brown, medium-to-coarse SAND, trace fine gravel and silt. Wet.			
12_						
- End of boring at 12 feet bgs -						
<div><div><div>Notes:</div><div>bgs = below ground surface</div><div>ft = feet</div><div>ppm = parts per million</div><div>NA = Not Applicable</div><div>SubA = subangular</div><div>SubR = subrounded</div><div>PID = Photoionization Detector</div></div><div><div>PROPORTIONS USED</div><div>(BY DRY WEIGHT)</div><div>0 to 10% = Trace</div><div>&gt;10 to 20% = Little</div><div>&gt;20 to 35% = Some</div><div>&gt;35 to 50% = And</div><div>&gt; 50% = Major</div></div></div> <div><div>* United States Environmental Protection Agency, Office of Environmental Measurement and Evaluation</div><div>** MultiRAE Plus Systems multi-gas photoionization detector calibrated to 100 ppm isobutylene, 50 ppm carbon monoxide, 25 ppm hydrogen sulfide, 20.9% oxygen, and 50% methane.</div><div>*** Soil sample SB-05 collected from 10 to 16-inch interval from Macrocore No. 3 (8 - 12 feet). PID = 2.1 ppm.</div></div> <div>Analytical results for Total Petroleum Hydrocarbons (C9 - C36) = Non-detect [&lt;9.5 milligrams per kilogram (mg/Kg)].</div>						

WESTON SOLUTIONS, INC.			SOIL BORING LOG			
Project	Turkey Brook		Boring ID	SB-06	Groundwater Levels	
Location	Oakville, Connecticut		Well ID	NA	Date	Depth
Date Drilled	November 21, 2013		Drilling Method	Direct Push	NA	NA
Drilling Company	U.S. EPA OEME*		Sampling Method	4-ft. Macrocore		
Operator	Jerry Keefe/Dan Granz		Completion Depth	12 feet bgs		
Drill Rig	Geoprobe		Surface Elevation	NA		
Logged by	George Mavris - Weston, Superfund Technical Assessment and Response Team (START)					
Depth (ft bgs)	Macrocore Number	Recovery (inches)	Soil Description (Burmister System)			PID Screen (ppm)**
1_	1	18	0 - 2" Dark brown, fine SAND and SILT, trace fine gravel and roots (topsoil). Moist.			Top = 0.1 Bottom = 0.1 Length = 0
2_			2 - 10" Dark brown, fine-to-medium SAND, some coarse-to- fine gravel (SubA, gneissic), trace silt and roots. Dry. [Fill].			
3_			10 - 18" Blackish-gray, coarse GRAVEL (SubA, gneissic), little medium sand, trace silt. Dry. [Fill].			
4_						
5_	2	30	0 - 4" Reddish-brown, medium SAND, trace silt. Moist. [Fill].			Top = 0.7 Bottom = 0.2 Length = 0
6_			4 - 7" Grayish-white, coarse GRAVEL (SubA, gneissic). Dry. [Fill].			
7_			7 - 30" Brown, fine SAND (mottled ?, indurated), little coarse gravel (SubA). Very moist. [Fill]			
8_						
9_	3	33	0 - 23"*** Reddish-brown and brown, medium-to-fine SAND, little coarse-to-fine gravel (SubA, gneissic), trace silt. Very moist. [Fill].			Top = 0.2 Bottom = 0.1 Length = 0
10_			23 - 26" Tannish-white, coarse GRAVEL (SubA, feldspar). Dry. [Fill].			
11_			26 - 33" Orange-brown, coarse GRAVEL (SubA, feldspar). Saturated. [Fill].			
12_			- End of Boring at 12 feet bgs -			
<div><div><div>Notes:</div><div>bgs = below ground surface</div><div>ft = feet</div><div>ppm = parts per million</div><div>NA = Not Applicable</div><div>SubA = subangular</div><div>PID = Photoionization Detector</div></div><div><div>PROPORTIONS USED</div><div>(BY DRY WEIGHT)</div><div>0 to 10% = Trace</div><div>&gt;10 to 20% = Little</div><div>&gt;20 to 35% = Some</div><div>&gt;35 to 50% = And</div><div>&gt; 50% = Major</div></div></div> <div><div>* United States Environmental Protection Agency, Office of Environmental Measurement and Evaluation</div><div>** MultiRAE Plus Systems multi-gas photoionization detector calibrated to 100 ppm isobutylene, 50 ppm carbon monoxide, 25 ppm hydrogen sulfide, 20.9% oxygen, and 50% methane.</div><div>*** Soil sample SB-06 collected from 15 to 23-inch interval from Macrocore No. 3 (8 - 12 feet). PID = 0 ppm.</div></div> <div>Analytical results for Total Petroleum Hydrocarbons (C9 - C36) = Non-detect [&lt;9.2 milligrams per kilogram (mg/Kg)].</div>						

WESTON SOLUTIONS, INC.		SOIL BORING LOG			
Project	Turkey Brook	Boring ID	SB-07	Groundwater Levels	
Location	Oakville, Connecticut	Well ID	NA	Date	Depth
Date Drilled	November 21, 2013	Drilling Method	Direct Push	NA	NA
Drilling Company	U.S. EPA OEME*	Sampling Method	4-ft. Macrocore		
Operator	Jerry Keefe/Dan Granz	Completion Depth	6.5 feet		
Drill Rig	Geoprobe	Surface Elevation	NA		
Logged by	George Mavis - Weston, Superfund Technical Assessment and Response Team (START)				
Depth (ft bgs)	Macrocore Number	Recovery (inches)	Soil Description (Burmister System)		PID Screen (ppm)**
1_	1	23	0 - 2" Dark brown, fine SAND and SILT, trace roots and grass (topsoil). Moist.		Top = 0.1 Bottom = 0.3 Length = 0
2_			2 - 23" Brown, medium-to-fine SAND, little coarse-to-fine gravel (SubR and SubA), trace silt. Moist. [Fill].		
3_					
4_					
5_	2	20	0 - 9" Brown, medium SAND, little coarse-to-fine gravel (SubA), trace silt. Dry. [Fill].		Top = 0 Bottom = 0 Length = 0
6_			9 - 11" Whitish-gray, coarse GRAVEL (SubA, gneissic). Dry. [Fill].		
7_			11 - 20"*** Brown and black, coarse SAND, trace coarse gravel (SubA, gneissic) and silt. Dry. [Fill].		
8_					
- Refusal at 6.5 feet -					
<div style="display: flex; justify-content: space-between;"> <div> <p><b>Notes:</b></p> <p>bgs = below ground surface</p> <p>ft = feet</p> <p>ppm = parts per million</p> <p>NA = Not Applicable</p> <p>SubA = subangular</p> <p>SubR = subrounded</p> <p>PID = Photoionization Detector</p> </div> <div style="border: 1px solid black; padding: 5px;"> <p><b>PROPORTIONS USED</b> (BY DRY WEIGHT)</p> <p>0 to 10% = Trace</p> <p>&gt;10 to 20% = Little</p> <p>&gt;20 to 35% = Some</p> <p>&gt;35 to 50% = And</p> <p>&gt; 50% = Major</p> </div> </div> <div style="margin-top: 20px;"> <p>* United States Environmental Protection Agency, Office of Environmental Measurement and Evaluation</p> <p>** MultiRAE Plus Systems multi-gas photoionization detector calibrated to 100 ppm isobutylene, 50 ppm carbon monoxide, 25 ppm hydrogen sulfide, 20.9% oxygen, and 50% methane.</p> <p>*** Soil sample SB-07 collected from 11 to 20-inch interval from Macrocore No. 2 (4 - 6.5 feet). PID = 0 ppm.</p> <p><b>Analytical results for Total Petroleum Hydrocarbons (C9 - C36) = Non-detect [&lt;8.6 milligrams per kilogram (mg/Kg)].</b></p> </div>					

WESTON SOLUTIONS, INC.			SOIL BORING LOG			
Project	Turkey Brook		Boring ID	SB-08	Groundwater Levels	
Location	Oakville, Connecticut		Well ID	NA	Date	Depth
Date Drilled	November 21, 2013		Drilling Method	Direct Push	NA	NA
Drilling Company	U.S. EPA OEME*		Sampling Method	4-ft. Macrocore		
Operator	Jerry Keefe/Dan Granz		Completion Depth	12 feet		
Drill Rig	Geoprobe		Surface Elevation	NA		
Logged by	George Mavris - Weston, Superfund Technical Assessment and Response Team (START)					
Depth (ft bgs)	Macrocore Number	Recovery (inches)	Soil Description (Burmister System)			PID Screen (ppm)**
1 2 3 4	1	26	0 - 2" Dark brown, fine SAND and SILT, trace roots and (topsoil). Moist. 2 - 26" Brown and black, medium-to-fine SAND, trace fine gravel and silt. Moist. [Fill].			Top = 0.7 Bottom = 0.2 Length = 0
5 6 7 8	2	32	0 - 5" Whitish-gray, coarse GRAVEL (SubA, gneissic). Dry. [Fill]. 5 - 15" Brown, medium-to-coarse SAND, little fine-to-coarse gravel, trace silt, Moist [Fill]. 15 - 21 " Light gray, coarse GRAVEL (SubA, gneissic). Dry. [Fill]. 21 - 32" Copper brown, medium-to-coarse SAND, some coarse-to-fine gravel (SubA and SubR), trace silt. Moist. [Fill].			Top = 0.2 Bottom = 0.2 Length = 0
9 10 11 12	3	39	0 - 11" Brown, very coarse SAND, little fine-to-coarse gravel (SubA), trace silt. Wet. [Fill]. 11 - 39"*** Light greenish-brown, fine-to-medium SAND, little fine-to-coarse gravel, trace silt. Very tight. Wet. [Fill].			Top = 0.4 Bottom = 0.2 Length = 0
- End of Boring at 12 feet -						
<div><div><div>Notes:</div><div>bgs = below ground surface ft = feet ppm = parts per million NA = Not Applicable SubA = subangular SubR = subrounded PID = Photoionization Detector</div></div><div><div>PROPORTIONS USED (BY DRY WEIGHT)</div><div>0 to 10% = Trace &gt;10 to 20% = Little &gt;20 to 35% = Some &gt;35 to 50% = And &gt; 50% = Major</div></div></div> <div><div>* United States Environmental Protection Agency, Office of Environmental Measurement and Evaluation</div><div>** MultiRAE Plus Systems multi-gas photoionization detector calibrated to 100 ppm isobutylene, 50 ppm carbon monoxide, 25 ppm hydrogen sulfide, 20.9% oxygen, and 50% methane.</div><div>*** Soil sample SB-08 collected from 24 to 32-inch interval from Macrocore No. 3 (8 - 12 feet). PID = 0 ppm.</div></div> <div>Analytical results for Total Petroleum Hydrocarbons (C9 - C36) = Non-detect [&lt;9.1 milligrams per kilogram (mg/Kg)].</div>						



WESTON SOLUTIONS, INC.			SOIL BORING LOG			
Project	Turkey Brook		Boring ID	SB-09	Groundwater Levels	
Location	Oakville, Connecticut		Well ID	NA	Date	Depth
Date Drilled	November 21, 2013		Drilling Method	Direct Push	NA	NA
Drilling Company	U.S. EPA OEME*		Sampling Method	4-ft. Macrocore		
Operator	Jerry Keefe/Dan Granz		Completion Depth	10 feet bgs		
Drill Rig	Geoprobe		Surface Elevation	NA		
Logged by	George Mavris - Weston, Superfund Technical Assessment and Response Team (START)					
Depth (ft bgs)	Macrocore Number	Recovery (inches)	Soil Description (Burmister System)		PID Screen (ppm)**	
1_	1	27	0 - 1" Dark brown, fine SAND and SILT (topsoil). Moist.		Top = 0.1 Bottom = 0.1 Length = 0	
2_			1 - 11" Dark brown, medium SAND, little coarse-to-fine gravel (SubR) and silt. Moist. [Fill].			
3_			11 - 15" White, coarse GRAVEL (SubA, granitic). Dry. [Fill].			
4_			15 - 27" Dark brown, fine SAND, some silt, trace fine gravel. Moist. [Fill].			
5_	2	38	0 - 17" Brown and black, fine-to-medium SAND, little fine-to-coarse gravel (SubA), trace silt. Moist. [Fill].		Top = 0.3 Bottom = 2.2 Length = 7.6	
6_			17 - 19" Grayish-white, coarse GRAVEL (SubR, gneissic). Dry. [Fill].			
7_			19 - 33" Brown, coarse-to-medium SAND, little coarse-to-fine gravel, trace silt. Moist. [Fill].			
8_			33 - 38"*** Blackish-gray, coarse-to-medium SAND (petroleum odor), trace fine gravel. Moist. [Fill].			
9_	3	17	0 - 17" Light brown, fine-to-medium SAND, trace fine-to-coarse gravel (SubA) and silt. Moist. [Fill].		Top = 2.1 Bottom = 0.3 Length = 0	
10_						
11_						
12_						
- Refusal at 10 feet bgs -						
<div><div>Notes:</div><div>bgs = below ground surface ft = feet ppm = parts per million NA = Not Applicable SubA = subangular SubR = subrounded PID = Photoionization Detector</div><div>PROPORTIONS USED (BY DRY WEIGHT) 0 to 10% = Trace &gt;10 to 20% = Little &gt;20 to 35% = Some &gt;35 to 50% = And &gt; 50% = Major</div><div>* United States Environmental Protection Agency, Office of Environmental Measurement and Evaluation ** MultiRAE Plus Systems multi-gas photoionization detector calibrated to 100 ppm isobutylene, 50 ppm carbon monoxide, 25 ppm hydrogen sulfide, 20.9% oxygen, and 50% methane. *** Soil sample SB-09 collected from 33 to 38-inch interval from Macrocore No. 2 (4 - 8 feet). PID = 7.6 ppm.</div><div>Analytical results for Total Petroleum Hydrocarbons (C9 - C36) = 12,000 milligrams per kilogram (mg/Kg).</div></div>						

WESTON SOLUTIONS, INC.		SOIL BORING LOG			
Project	Turkey Brook	Boring ID	SB-10	Groundwater Levels	
Location	Oakville, Connecticut	Well ID	NA	Date	Depth
Date Drilled	November 21, 2013	Drilling Method	Direct Push	NA	NA
Drilling Company	U.S. EPA OEME*	Sampling Method	4-ft. Macrocore		
Operator	Jerry Keefe/Dan Granz	Completion Depth	12 feet bgs		
Drill Rig	Geoprobe	Surface Elevation	NA		
Logged by	George Mavris - Weston, Superfund Technical Assessment and Response Team (START)				
Depth (ft bgs)	Macrocore Number	Recovery (inches)	Soil Description (Burmister System)		PID Screen (ppm)**
1 2 3 4	1	25	0 - 2" Dark brown, fine SAND and SILT (topsoil). Moist. 2 - 25" Dark brown, fine-to-medium SAND, little coarse-to-fine gravel (SubA), trace silt. Moist. [Fill].		Top = 0.1 Bottom = 0.1 Length = 0
5 6 7 8	2	30	0 - 7" Gray, coarse GRAVEL (SubA) and coarse-to-medium SAND, trace silt. Moist. [Fill]. 7 - 17" Brown, fine SAND, little fine gravel and silt. Moist. [Fill]. 17 - 26"*** Gray, coarse-to-medium SAND (petroleum odor), trace fine gravel and silt. Moist. [Fill]. 26 - 30" Brown, fine-to-coarse SAND, trace fine gravel and silt. Wet.		Top = 0 Bottom = 0.4 Length = 5.9
9 10 11 12	3	36	0 - 36" Brown and orange-brown, fine-to-coarse SAND (slight petroleum odor in 0 to 20-inch interval), trace fine gravel and silt. Wet.		Top = 0.1 Bottom = 0.1 Length = 0
- End of Boring at 12 feet bgs -					
<div><div><div>Notes:</div><div>bgs = below ground surface ft = feet ppm = parts per million NA = Not Applicable SubA = subangular PID = Photoionization Detector</div></div><div><div>PROPORTIONS USED</div><div>(BY DRY WEIGHT)</div><div>0 to 10% = Trace &gt;10 to 20% = Little &gt;20 to 35% = Some &gt;35 to 50% = And &gt; 50% = Major</div></div></div> <div><div>* United States Environmental Protection Agency, Office of Environmental Measurement and Evaluation</div><div>** MultiRAE Plus Systems multi-gas photoionization detector calibrated to 100 ppm isobutylene, 50 ppm carbon monoxide, 25 ppm hydrogen sulfide, 20.9% oxygen, and 50% methane.</div><div>*** Soil sample SB-10 collected from 17 to 26-inch interval from Macrocore No. 2 (4 - 8 feet). PID = 5.9 ppm.</div></div> <div>Analytical results for Total Petroleum Hydrocarbons (C9 - C36) = 14,000 milligrams per kilogram (mg/Kg).</div>					

WESTON SOLUTIONS, INC.			SOIL BORING LOG		
Project	Turkey Brook		Boring ID	SBC-01	
Location	Oakville, Connecticut		Well ID	NA	
Date Drilled	November 20, 2013		Drilling Method	Direct Push	Groundwater Levels
Drilling Company	Weston Solutions, Inc.		Sampling Method	4-ft. Macrocore	Date
Operator	Colin Cardin/Eric Ackerman		Completion Depth	2 feet bgs	Depth
Drill Rig	Pneumatic Jack Hammer		Surface Elevation	NA	
Logged by	George Mavis - Weston, Superfund Technical Assessment and Response Team (START)				
Depth (ft bgs)	Macrocore Number	Recovery (inches)	Soil Description (Burmister System)		PID Screen (ppm)*
1_	1	12	Drilled hole through concrete floor (approximately 4 inches thick).		Top = 1.1 Bottom = 0 Length = 0
2_			0 - 3" Grayish-white, coarse GRAVEL (SubA). Dry. [Fill].		
3_			3 - 12" Brown, medium-to-coarse SAND, little coarse-to-fine gravel (SubA), trace silt. Dry. [Fill].		
4_			- Refusal at 2 feet -		
<div> <div> <b>Notes:</b>  bgs = below top of soil under concrete floor  ft = feet  ppm = parts per million  NA = Not Applicable  SubA = subangular  PID = Photoionization Detector </div> <div> <b>PROPORTIONS USED (BY DRY WEIGHT)</b>  0 to 10% = Trace  &gt;10 to 20% = Little  &gt;20 to 35% = Some  &gt;35 to 50% = And  &gt; 50% = Major </div> </div> <p>* MultiRAE Plus Systems multi-gas photoionization detector calibrated to 100 ppm isobutylene, 50 ppm carbon monoxide, 25 ppm hydrogen sulfide, 20.9% oxygen, and 50% methane. No soil sample collected.</p>					

WESTON SOLUTIONS, INC.			SOIL BORING LOG		
Project	Turkey Brook		Boring ID	SBC-02	
Location	Oakville, Connecticut		Well ID	NA	
Date Drilled	November 21, 2013		Drilling Method	Direct Push	
Drilling Company	Weston Solutions, Inc.		Sampling Method	4-ft. Macrocore	
Operator	Colin Cardin/Eric Ackerman		Completion Depth	4 feet bgs	
Drill Rig	Pneumatic Jack Hammer		Surface Elevation	NA	
Logged by	George Mavis - Weston, Superfund Technical Assessment and Response Team (START)				
Depth (ft bgs)	Macrocore Number	Recovery (inches)	Soil Description (Burmister System)		PID Screen (ppm)*
1_	1	42	Drilled hole through concrete floor (approximately 4 inches thick). 0 - 5" ** Brownish-black, medium-to-coarse SAND, trace fine gravel and silt. Moist. [Fill].		Top = 10.5 Bottom = 0 Length = 0
2_			5 - 35" Light brown and gray, coarse-to-medium SAND, little coarse-to-fine gravel (SubA, granitic and gneissic). Moist. [Fill].		
3_			35 - 42" Brown, medium-to-coarse SAND, little fine gravel and silt. Wet. [Fill].		
4_			- End of Boring at 4 feet bgs -		
<div> <div> <b>Notes:</b>  bgs = below top of soil under concrete floor  ft = feet  ppm = parts per million  NA = Not Applicable  SubA = subangular  PID = Photoionization Detector </div> <div> <b>PROPORTIONS USED (BY DRY WEIGHT)</b>  0 to 10% = Trace  &gt;10 to 20% = Little  &gt;20 to 35% = Some  &gt;35 to 50% = And  &gt; 50% = Major </div> </div> <div> * MultiRAE Plus Systems multi-gas photoionization detector calibrated to 100 ppm isobutylene, 50 ppm carbon monoxide, 25 ppm hydrogen sulfide, 20.9% oxygen, and 50% methane.  ** Soil sample SBC-02 collected from 0 to 5-inch interval from Macrocore No. 1 (0 - 4 feet). PID = 10.5 ppm.   <b>Analytical results for Total Petroleum Hydrocarbons (C9 - C36) = 410 milligrams per kilogram (mg/Kg).</b> </div>					



WESTON SOLUTIONS, INC.			SOIL BORING LOG		
Project	Turkey Brook		Boring ID	SBC-03	
Location	Oakville, Connecticut		Well ID	NA	
Date Drilled	November 21, 2013		Drilling Method	Direct Push	Groundwater Levels Date      Depth
Drilling Company	Weston Solutions, Inc.		Sampling Method	4-ft. Macrocore	NA      NA
Operator	Colin Cardin/Eric Ackerman		Completion Depth	4 feet bgs	
Drill Rig	Pneumatic Jack Hammer		Surface Elevation	NA	
Logged by	George Mavris - Weston, Superfund Technical Assessment and Response Team (START)				
Depth (ft bgs)	Macrocore Number	Recovery (inches)	Soil Description (Burmister System)		PID Screen (ppm)*
1_	1	26	Drilled hole through concrete floor (approximately 4 inches thick). 0 - 20" ** Black, fine-to-medium SAND, trace fine gravel and silt. Moist. [Fill]. 20 - 26" Brown and black, coarse-to-medium SAND, trace fine-to-coarse gravel and silt. Moist. [Fill].		Top = 1.4 Bottom = 0 Length = 2.1
2_					
3_					
4_			- End of Boring at 4 feet bgs -		
<div style="display: flex; justify-content: space-between;"> <div> <p><b>Notes:</b></p> <p>bgs = below top of soil under concrete floor</p> <p>ft = feet</p> <p>ppm = parts per million</p> <p>NA = Not Applicable</p> <p>PID = Photoionization Detector</p> </div> <div style="border: 1px solid black; padding: 5px;"> <p><b>PROPORTIONS USED (BY DRY WEIGHT)</b></p> <p>0 to 10% = Trace</p> <p>&gt;10 to 20% = Little</p> <p>&gt;20 to 35% = Some</p> <p>&gt;35 to 50% = And</p> <p>&gt; 50% = Major</p> </div> </div> <div style="margin-top: 20px;"> <p>* MultiRAE Plus Systems multi-gas photoionization detector calibrated to 100 ppm isobutylene, 50 ppm carbon monoxide, 25 ppm hydrogen sulfide, 20.9% oxygen, and 50% methane.</p> <p>** Soil sample SBC-03 collected from 15 to 20-inch interval from Macrocore No. 1 (0 - 4 feet). PID = 2.1</p> <p><b>Analytical results for Total Petroleum Hydrocarbons (C9 - C36) = 7,700 milligrams per kilogram (mg/Kg).</b></p> </div>					

WESTON SOLUTIONS, INC.			SOIL BORING LOG		
Project	Turkey Brook		Boring ID	SBC-04	
Location	Oakville, Connecticut		Well ID	NA	
Date Drilled	November 21, 2013		Drilling Method	Direct Push	Groundwater Levels
Drilling Company	Weston Solutions, Inc.		Sampling Method	4-ft. Macrocore	Date
Operator	Colin Cardin/Eric Ackerman		Completion Depth	2 feet bgs	Depth
Drill Rig	Pneumatic Jack Hammer		Surface Elevation	NA	
Logged by	George Mavis - Weston, Superfund Technical Assessment and Response Team (START)				
Depth (ft bgs)	Macrocore Number	Recovery (inches)	Soil Description (Burmister System)		PID Screen (ppm)*
1_	1	18	Drilled hole through concrete floor (approximately 4 inches thick).		Top = 0.5 Bottom = 0.6 Length = 2.1
2_			0 - 18" ** Black, fine-to-medium SAND, trace fine gravel and silt. Moist.		
3_					
4_			- Refusal at 2 feet bgs -		
<div> <p><b>Notes:</b></p> <p>bgs = below top of soil under concrete floor</p> <p>ft = feet</p> <p>ppm = parts per million</p> <p>NA = Not Applicable</p> <p>PID = Photoionization Detector</p> </div> <div> <p><b>PROPORTIONS USED</b></p> <p>(BY DRY WEIGHT)</p> <p>0 to 10% = Trace</p> <p>&gt;10 to 20% = Little</p> <p>&gt;20 to 35% = Some</p> <p>&gt;35 to 50% = And</p> <p>&gt; 50% = Major</p> </div> <div> <p>* MultiRAE Plus Systems multi-gas photoionization detector calibrated to 100 ppm isobutylene, 50 ppm carbon monoxide, 25 ppm hydrogen sulfide, 20.9% oxygen, and 50% methane.</p> <p>** Soil sample SBC-04 collected from 0 to 18-inch interval from Macrocore No. 1 (0 - 4 feet). PID = 2.1 ppm.</p> <p><b>Analytical results for Total Petroleum Hydrocarbons (C9 - C36) = 2,400 milligrams per kilogram (mg/Kg).</b></p> </div>					

WESTON SOLUTIONS, INC.			SOIL BORING LOG			
Project	Turkey Brook		Boring ID	SBC-05	Groundwater Levels	
Location	Oakville, Connecticut		Well ID	NA	Date	Depth
Date Drilled	November 21, 2013		Drilling Method	Direct Push	NA	NA
Drilling Company	Weston Solutions, Inc.		Sampling Method	4-ft. Macrocore		
Operator	Colin Cardin/Eric Ackerman		Completion Depth	4 feet bgs		
Drill Rig	Pneumatic Jack Hammer		Surface Elevation	NA		
Logged by	George Mavris - Weston, Superfund Technical Assessment and Response Team (START)					
Depth (ft bgs)	Macrocore Number	Recovery (inches)	Soil Description (Burmister System)			PID Screen (ppm)*
1_	1	26	Drilled hole through concrete floor (approximately 4 inches thick).			Top = 0.3 Bottom = 0.2 Length = 0
2_			0 - 7"*** Black, fine-to-medium SAND, trace silt. Moist. [Fill].			
3_			7 - 15" Brown, medium-to-coarse SAND, some coarse-to-fine-gravel (SubA, granitic). Moist. [Fill].			
4_			15 - 18" Brown, f. - to - m. SAND, some c. gravel (SubA, gneissic). Moist. [Fill].			
			18 - 22" Whitish-gray, coarse GRAVEL (SubA, granitic). Moist. [Fill].			
			22 -26" Brown and gray, c. - m. SAND, some c. gravel (SubA, granitic). Dry. [Fill].			
			- End of Boring at 4 feet bgs -			

**Notes:**

bgs = below top of soil under concrete floor

ft = feet

ppm = parts per million

NA = Not Applicable

SubA = subangular

PID = Photoionization Detector

f. = fine

m. = medium

c. = coarse

**PROPORTIONS USED (BY DRY WEIGHT)**

0 to 10% = Trace

>10 to 20% = Little

>20 to 35% = Some

>35 to 50% = And

> 50% = Major

\* MultiRAE Plus Systems multi-gas photoionization detector calibrated to 100 ppm isobutylene, 50 ppm carbon monoxide, 25 ppm hydrogen sulfide, 20.9% oxygen, and 50% methane.

\*\* Soil sample SBC-05 collected from 0 to 7-inch interval from Macrocore No. 1 (0 - 4 feet). PID = 0 ppm.

**Analytical results for Total Petroleum Hydrocarbons (C9 - C36) = 210 milligrams per kilogram (mg/Kg).**

WESTON SOLUTIONS, INC.			SOIL BORING LOG			
Project	Turkey Brook		Boring ID	SBC-06	Groundwater Levels	
Location	Oakville, Connecticut		Well ID	NA	Date	Depth
Date Drilled	November 21, 2013		Drilling Method	Direct Push	NA	NA
Drilling Company	Weston Solutions, Inc.		Sampling Method	4-ft. Macrocore		
Operator	Colin Cardin/Eric Ackerman		Completion Depth	4 feet bgs		
Drill Rig	Pneumatic Jack Hammer		Surface Elevation	NA		
Logged by	George Mavis - Weston, Superfund Technical Assessment and Response Team (START)					
Depth (ft bgs)	Macrocore Number	Recovery (inches)	Soil Description (Burmister System)			PID Screen (ppm)*
1_	1	17	Drilled hole through concrete floor (approximately 4 inches thick). 0 - 5" Black, fine SAND and SILT. Moist. [Fill]. 5 - 6" Reddish-brown, coarse GRAVEL (SubA). Dry. [Fill]. 6 - 10" Grayish-white, coarse GRAVEL (SubA, granitic). Dry. [Fill]. 10 - 13" ** Black, fine SAND (petroleum odor), trace silt. Moist. [Fill]. 13 - 17" Blackish-brown, coarse-to-medium SAND, trace silt. Moist. [Fill].  - Refusal 3 feet bgs -			Top = 0.2 Bottom = 0.2 Length = 2.1
2_						
3_						
4_						
<div> <div> <b>Notes:</b>            bgs = below top of soil under concrete floor            ft = feet            ppm = parts per million            NA = Not Applicable            SubA = subangular            PID = Photoionization Detector         </div> <div> <b>PROPORTIONS USED (BY DRY WEIGHT)</b>            0 to 10% = Trace            &gt;10 to 20% = Little            &gt;20 to 35% = Some            &gt;35 to 50% = And            &gt; 50% = Major         </div> </div> <div> <p>* MultiRAE Plus Systems multi-gas photoionization detector calibrated to 100 ppm isobutylene, 50 ppm carbon monoxide, 25 ppm hydrogen sulfide, 20.9% oxygen, and 50% methane.</p> <p>** Soil sample SBC-06 collected from 10 to 13-inch interval from Macrocore No. 1 (0 - 4 feet). PID = 2.1</p> <p><b>Analytical results for Total Petroleum Hydrocarbons (C9 - C36) = 11,000 milligrams per kilogram (mg/Kg).</b></p> </div>						

WESTON SOLUTIONS, INC.			SOIL BORING LOG			
Project	Turkey Brook		Boring ID	SBC-07	Groundwater Levels	
Location	Oakville, Connecticut		Well ID	NA	Date	Depth
Date Drilled	November 21, 2013		Drilling Method	Direct Push	NA	NA
Drilling Company	Weston Solutions, Inc.		Sampling Method	4-ft. Macrocore		
Operator	Colin Cardin/Eric Ackerman		Completion Depth	3.7 feet bgs		
Drill Rig	Pneumatic Jack Hammer		Surface Elevation	NA		
Logged by	George Mavris - Weston, Superfund Technical Assessment and Response Team (START)					
Depth (ft bgs)	Macrocore Number	Recovery (inches)	Soil Description (Burmister System)			PID Screen (ppm)
1_	1	34	Drilled hole through concrete floor (approximately 4 inches thick). 0 - 4" Dark brown and black, fine-to-medium SAND, trace fine gravel and silt. Moist. [Fill].			NA*
2_			4 - 8"*** Black, fine SAND, trace silt. Moist. [Fill].			
3_			8 - 13" Blackish-brown, f.-to-m. SAND, trace fine gravel and silt. Moist. [Fill].			
4_			13 - 24" Gray-white, c.-to-f. GRAVEL (gneissic), some c.-to-m. sand. Dry. [Fill].			
			24 - 34" Gray-white, c.-to-m. SAND, little c.-to-f. Gravel, trace silt. Dry. [Fill].			
			- Refusal 3.7 feet bgs -			
<div><div><b>Notes:</b> bgs = below top of soil under concrete floor ft = feet ppm = parts per million NA = Not Applicable SubA = subangular PID = Photoionization Detector f. = fine m. = medium c. = coarse</div><div><b>PROPORTIONS USED (BY DRY WEIGHT)</b> 0 to 10% = Trace &gt;10 to 20% = Little &gt;20 to 35% = Some &gt;35 to 50% = And &gt; 50% = Major</div></div> <div><p>* MultiRAE Plus Systems multi-gas photoionization detector (PID) not functioning properly due to inclement weather conditions (steady rain).</p><p>** Soil sample SBC-07 collected from 4 to 6-inch interval from Macrocore No. 1 (0 - 4 feet).</p><p>Analytical results for Total Petroleum Hydrocarbons (C9 - C36) = 53 milligrams per kilogram (mg/Kg).</p></div>						



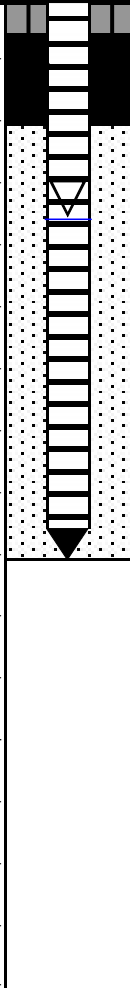
WESTON SOLUTIONS, INC.			SOIL BORING LOG		
<b>Project</b>	Turkey Brook		<b>Boring ID</b>	SBC-08	<b>Groundwater Levels</b>
<b>Location</b>	Oakville, Connecticut		<b>Well ID</b>	NA	<b>Date</b> <b>Depth</b>
<b>Date Drilled</b>	November 21, 2013		<b>Drilling Method</b>	Direct Push	NA      NA
<b>Drilling Company</b>	Weston Solutions, Inc.		<b>Sampling Method</b>	4-ft. Macrocore	
<b>Operator</b>	Colin Cardin/Eric Ackerman		<b>Completion Depth</b>	4 feet bgs	
<b>Drill Rig</b>	Pneumatic Jack Hammer		<b>Surface Elevation</b>	NA	
<b>Logged by</b>	George Mavis - Weston, Superfund Technical Assessment and Response Team (START)				
<b>Depth (ft bgs)</b>	<b>Macrocore Number</b>	<b>Recovery (inches)</b>	<b>Soil Description (Burmister System)</b>		<b>PID Screen (ppm)</b>
1_	1	17	Drilled hole through concrete floor (approximately 4 inches thick).		NA*
2_			0 - 13" ** Grayish-black, medium-to-fine SAND, trace fine gravel and silt. Moist. [Fill].		
3_			13 - 17" Grayish-white, coarse-to-fine GRAVEL (SubA), little medium-to-fine sand. Moist. [Fill].		
4_			- End of Boring at 4 feet bgs -		
<div> <p><b>Notes:</b></p> <p>bgs = below top of soil under concrete floor</p> <p>ft = feet</p> <p>ppm = parts per million</p> <p>NA = Not Applicable</p> <p>SubA = subangular</p> <p>PID = Photoionization Detector</p> <p>f. = fine</p> <p>m. = medium</p> <p>c. = coarse</p> </div> <div> <p><b>PROPORTIONS USED (BY DRY WEIGHT)</b></p> <p>0 to 10% = Trace</p> <p>&gt;10 to 20% = Little</p> <p>&gt;20 to 35% = Some</p> <p>&gt;35 to 50% = And</p> <p>&gt; 50% = Major</p> </div> <div> <p>* MultiRAE Plus Systems multi-gas photoionization detector (PID) not functioning properly due to inclement weather conditions (steady rain).</p> <p>** Soil sample SBC-08 collected from 0 to 13-inch interval from Macrocore No. 1 (0 - 4 feet).</p> <p><b>Analytical results for Total Petroleum Hydrocarbons (C9 - C36) = 17,000 milligrams per kilogram (mg/Kg).</b></p> </div>					

WESTON SOLUTIONS, INC.			SOIL BORING LOG		
Project	Turkey Brook		Boring ID	SBC-09	
Location	Oakville, Connecticut		Well ID	NA	
Date Drilled	November 21, 2013		Drilling Method	Direct Push	
Drilling Company	Weston Solutions, Inc.		Sampling Method	4-ft. Macrocore	
Operator	Colin Cardin/Eric Ackerman		Completion Depth	4 feet bgs	
Drill Rig	Pneumatic Jack Hammer		Surface Elevation	NA	
Logged by	George Mavis - Weston, Superfund Technical Assessment and Response Team (START)				
Depth (ft bgs)	Macrocore Number	Recovery (inches)	Soil Description (Burmister System)		PID Screen (ppm)
1_	1	32	Drilled hole through concrete floor (approximately 4 inches thick).		NA*
2_			0 - 5" Brown and black, fine and SILT, trace fine gravel. Moist. [Fill].		
3_			5 - 26" ** Black, medium SAND (slight petroleum odor), trace fine-to-coarse gravel and silt. Moist. [Fill].		
4_			26 - 32" Grayish-white, coarse-to-fine GRAVEL (SubA) and coarse-to-medium SAND. Moist. [Fill].		
- End of Boring at 4 feet bgs -					
<div style="display: flex; justify-content: space-between;"> <div> <p><b>Notes:</b></p> <p>bgs = below top of soil under concrete floor</p> <p>ft = feet</p> <p>ppm = parts per million</p> <p>NA = Not Applicable</p> <p>SubA = subangular</p> <p>PID = Photoionization Detector</p> </div> <div style="border: 1px solid black; padding: 5px;"> <p><b>PROPORTIONS USED</b> (BY DRY WEIGHT)</p> <p>0 to 10% = Trace</p> <p>&gt;10 to 20% = Little</p> <p>&gt;20 to 35% = Some</p> <p>&gt;35 to 50% = And</p> <p>&gt; 50% = Major</p> </div> </div> <div style="margin-top: 20px;"> <p>* MultiRAE Plus Systems multi-gas photoionization detector (PID) not functioning properly due to inclement weather conditions (steady rain).</p> <p>** Soil sample SBC-09 collected from 5 to 11-inch interval from Macrocore No. 1 (0 - 4 feet).</p> <p><b>Analytical results for Total Petroleum Hydrocarbons (C9 - C36) = 21,000 milligrams per kilogram (mg/Kg).</b></p> </div>					

WESTON SOLUTIONS, INC.			SOIL BORING LOG		
Project	Turkey Brook		Boring ID	SBC-10	
Location	Oakville, Connecticut		Well ID	NA	
Date Drilled	November 21, 2013		Drilling Method	Direct Push	Groundwater Levels
Drilling Company	Weston Solutions, Inc.		Sampling Method	4-ft. Macrocore	Date
Operator	Colin Cardin/Eric Ackerman		Completion Depth	4 feet bgs	Depth
Drill Rig	Pneumatic Jack Hammer		Surface Elevation	NA	
Logged by	George Mavis - Weston, Superfund Technical Assessment and Response Team (START)				
Depth (ft bgs)	Macrocore Number	Recovery (inches)	Soil Description (Burmister System)		PID Screen (ppm)
1_	1	22	Drilled hole through concrete floor (approximately 4 inches thick).		NA*
2_			0 - 9" Brown and black, medium-to-fine SAND, trace fine gravel and silt. Moist. [Fill].		
3_			9 - 17" Black, medium-to-coarse SAND, trace fine gravel and silt. Moist. [Fill].		
4_			17 - 22" Grayish-white, coarse-to-fine GRAVEL (SubA) and coarse-to-medium SAND. Moist. [Fill].		
- End of Boring at 4 feet bgs -					
<div style="display: flex; justify-content: space-between;"> <div> <p><b>Notes:</b></p> <p>bgs = below top of soil under concrete floor</p> <p>ft = feet</p> <p>ppm = parts per million</p> <p>NA = Not Applicable</p> <p>SubA = subangular</p> <p>PID = Photoionization Detector</p> </div> <div style="border: 1px solid black; padding: 5px;"> <p><b>PROPORTIONS USED</b></p> <p>(BY DRY WEIGHT)</p> <p>0 to 10% = Trace</p> <p>&gt;10 to 20% = Little</p> <p>&gt;20 to 35% = Some</p> <p>&gt;35 to 50% = And</p> <p>&gt; 50% = Major</p> </div> </div> <div style="margin-top: 20px;"> <p>* MultiRAE Plus Systems multi-gas photoionization detector (PID) not functioning properly due to inclement weather conditions (steady rain).</p> <p>** Soil sample SBC-10 collected from 9 to 17-inch interval from Macrocore No. 1 (0 - 4 feet).</p> <p><b>Analytical results for Total Petroleum Hydrocarbons (C9 - C36) = 15,000 milligrams per kilogram (mg/Kg).</b></p> </div>					






WESTON SOLUTIONS, INC.		SOIL BORING/WELL COMPLETION LOG			
Project	Turkey Brook Site	Boring ID	MW-08	Groundwater Levels*	
Location	Oakville, CT	Well ID	MW-08	Date	Depth (ft)
Date Drilled	18-Feb-14	Drilling Method	Drive and Wash	18-Feb-14	3.50
Drilling Company	New Hampshire Boring Co.	Sampling Method	NA		
Driller	Sam Shaw/Carl Downing	Completion Depth	9 Feet bfs		
Drill Rig Type	SIMCO M1	Surface Elevation			
Logged by	NA				

Depth (ft bgs)	Well Construct.	Macrocore Number	Recovery (inches)	Soil Description	PID Screen (ppm)
2		NA	NA	Cored 4.5 inches through concrete using a 6-inch diameter core drill. See co-located boring SBC-04 for soil descriptions	NA
4					
6					
8					
10					
12					
14					
16					




**Well Construction Details:**

	Screen	4-in diameter, slotted schedule 40 PVC, 0.5 to 9.0 feet below floor surface (bfs)
	Riser	4-in diameter, Schedule 40 PVC riser, 0 to 0.5 feet bfs
	Filter sand	Filter sand from 2 to 9 feet bfs
	Bentonite seal	Bentonite chip seal from 0.5 to 2.0 feet bfs
	Concrete	Concrete, 0 - 0.5 ft bfs

**Notes:**

\* Measurements from top of PVC riser  
bfs = below floor surface  
NA = Not Applicable

	Road Box
	Sediment Trap
	Top of water table

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## Appendix F

### Laboratory Analytical Data

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## Laboratory Report

November 26, 2013

Mia Pasquerella - Mail Code OSRR02-2  
US EPA New England R1

Project Number: 13110054  
Project: Turkey Brook - Litchfield, CT  
Analysis: VOAs in Soil High Level Method  
EPA Chemist: Joseph Montanaro

Date Samples Received by the Laboratory: 11/25/2013

### Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I SOP, EIASOP-VOAGCMS9.

Samples were analyzed by GC/MS. Samples were introduced to the GC via a Tekmar preconcentrator and an Archon auto-sampler. The analysis SOP is based on US EPA Method 8260B, revision 2.0, 1996 and Method 5035A, draft revision 1, 2002, from SW-846.

Data were reviewed in accordance with the internal verification procedures described in the EPA New England Quality Manual for NERL.

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

If you have any questions please call me at 617-918-8340 .

Sincerely,

Digitally signed by Dan Boudreau  
DN: cn=Dan Boudreau, o=EPA,  
ou=EIA,  
email=boudreau.dan@epa.gov, c=US  
Date: 2013.11.26 10:41:15 -05'00'

13110054\$VOAHS

**Qualifiers:**

<b>RL</b>	Reporting limit
<b>ND</b>	Not Detected above reporting limit
<b>NA</b>	Not Applicable
<b>NC</b>	Not calculated since analyte concentration is ND
<b>J1</b>	Estimated value due to MS recovery outside acceptance criteria
<b>J2</b>	Estimated value due to LFB result outside acceptance criteria
<b>J3</b>	Estimated value due to RPD result outside acceptance criteria
<b>J4</b>	Estimated value due to LCS result outside acceptance criteria
<b>B</b>	Analyte is associated with the lab blank or trip blank contamination. Values are qualified when the observed concentration of the contamination in the sample extract is less than 10 times the concentration in the blank.
<b>R</b>	No recovery was calculated since the analyte concentration is greater than four times the spike level.

**Turkey Brook - Litchfield, CT**

**VOAs in Soil High Level Method**

Client Sample ID: 13090009-0001

Date of Collection: 11/22/2013

Date of Preparation: 11/25/2013

Date of Analysis: 11/25/2013

Dry Weight Prepared: N/A

Wet Weight Prepared: 0.072 grams

Lab Sample ID: AB45642

Matrix: PRODUCT

Amount Prepared: 5 mL

Percent Solids: N/A

Extract Dilution: 50

pH: N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
74-87-3	Chloromethane	ND	6900	
75-01-4	Vinyl Chloride	ND	6900	
74-83-9	Bromomethane	ND	6900	
75-00-3	Chloroethane	ND	6900	
75-69-4	Trichlorofluoromethane	ND	6900	
60-29-7	Ethyl Ether	ND	6900	
67-64-1	2-Propanone (acetone)	ND	6900	
76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroetha	ND	6900	
75-35-4	1,1-Dichloroethylene	ND	6900	
75-15-0	Carbon Disulfide	ND	6900	
75-71-8	Dichlorodifluoromethane	ND	6900	
75-09-2	Methylene Chloride	ND	6900	
107-13-1	Acrylonitrile	ND	6900	
1634-04-4	Methyl-t-Butyl Ether	ND	6900	
156-60-5	Trans-1,2-Dichloroethylene	ND	6900	
75-34-3	1,1-dichloroethane	ND	6900	
108-05-4	Vinyl Acetate	ND	6900	
78-93-3	2-Butanone (MEK)	ND	6900	
594-20-7	2,2-Dichloropropane	ND	6900	
156-59-2	cis-1,2-Dichloroethylene	ND	6900	
67-66-3	Chloroform	ND	6900	
74-97-5	Bromochloromethane	ND	6900	
109-99-9	Tetrahydrofuran	ND	6900	
71-55-6	1,1,1-Trichloroethane	ND	6900	
107-06-2	1,2-Dichloroethane	ND	6900	
56-23-5	Carbon tetrachloride	ND	6900	
71-43-2	Benzene	ND	6900	
10061-01-5	c-1,3-dichloropropene	ND	6900	
108-88-3	Toluene	ND	6900	
10061-02-6	t-1,3-Dichloropropene	ND	6900	
79-00-5	1,1,2-Trichloroethane	ND	6900	
124-48-1	Dibromochloromethane	ND	6900	
108-90-7	Chlorobenzene	ND	6900	
563-58-6	1,1-Dichloropropene	ND	6900	
79-01-6	Trichloroethylene	ND	6900	
78-87-5	1,2-Dichloropropane	ND	6900	
75-27-4	Bromodichloromethane	ND	6900	
74-95-3	Dibromomethane	ND	6900	
108-10-1	4-Methyl-2-Pentanone(MIBK)	ND	6900	
142-28-9	1,3-Dichloropropane	ND	6900	
127-18-4	Tetrachloroethylene	ND	6900	
106-93-4	1,2-Dibromoethane	ND	6900	
591-78-6	2-Hexanone	ND	6900	
630-20-6	1,1,1,2-Tetrachloroethane	ND	6900	

13110054\$VOAHS



**Turkey Brook - Litchfield, CT**

**VOAs in Soil High Level Method**

Client Sample ID: 13090009-0001  
Date of Collection: 11/22/2013  
Date of Preparation: 11/25/2013  
Date of Analysis: 11/25/2013  
Dry Weight Prepared: N/A  
Wet Weight Prepared: 0.072 grams

Lab Sample ID: AB45642  
Matrix: PRODUCT  
Amount Prepared: 5 mL  
Percent Solids: N/A  
Extract Dilution: 50  
pH: N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
100-41-4	Ethylbenzene	ND	6900	
108-38-3/106-42-3	M/P Xylene	ND	14000	
95-47-6	Ortho Xylene	ND	6900	
100-42-5	Styrene	ND	6900	
75-25-2	Bromoform	ND	6900	
79-34-5	1,1,2,2-Tetrachloroethane	ND	6900	
98-82-8	Isopropylbenzene	ND	6900	
108-86-1	Bromobenzene	ND	6900	
96-18-4	1,2,3-Trichloropropane	ND	6900	
103-65-1	N-Propylbenzene	ND	6900	
95-49-8	2-Chlorotoluene	ND	6900	
106-43-4	4-Chlorotoluene	ND	6900	
98-06-6	Tert-Butylbenzene	ND	6900	
108-67-8	1,3,5-Trimethylbenzene	ND	6900	
95-63-6	1,2,4-Trimethylbenzene	ND	6900	
135-98-8	Sec-Butylbenzene	ND	6900	
541-73-1	1,3-Dichlorobenzene	ND	6900	
99-87-6	Para-Isopropyltoluene	ND	6900	
106-46-7	1,4-Dichlorobenzene	ND	6900	
95-50-1	1,2-Dichlorobenzene	ND	6900	
104-51-8	N-Butylbenzene	ND	6900	
96-12-8	1,2-Dibromo-3-Chloropropane	ND	6900	
120-82-1	1,2,4-Trichlorobenzene	ND	6900	
87-68-3	Hexachlorobutadiene	ND	6900	
91-20-3	Naphthalene	ND	6900	
87-61-6	1,2,3-Trichlorobenzene	ND	6900	

Surrogate Compounds	Recoveries (%)	QC Ranges
1,2-Dichloroethane-D4	111	74 - 136
Toluene-D8	98	85 - 118
1,4-Bromofluorobenzene	94	78 - 111

**Comments:** Sample concentrations are reported in wet weight.

Tentatively Identified Compound

	Concnetration (ug/Kg)	Qualifier
Undecane	48000	J

**Turkey Brook - Litchfield, CT**

**Laboratory Blank**

Client Sample ID:	N/A	Lab Sample ID:	N/A
Date of Collection:	N/A	Matrix:	PRODUCT
Date of Preparation:	11/25/2013	Amount Prepared:	5 mL
Date of Analysis:	11/25/2013	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	50
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration ug/L	RL ug/L	Qualifier
74-87-3	Chloromethane	ND	50	
75-01-4	Vinyl Chloride	ND	50	
74-83-9	Bromomethane	ND	50	
75-00-3	Chloroethane	ND	50	
75-69-4	Trichlorofluoromethane	ND	50	
60-29-7	Ethyl Ether	ND	50	
67-64-1	2-Propanone (acetone)	ND	50	
76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroetha	ND	50	
75-35-4	1,1-Dichloroethylene	ND	50	
75-15-0	Carbon Disulfide	ND	50	
75-71-8	Dichlorodifluoromethane	ND	50	
75-09-2	Methylene Chloride	ND	50	
107-13-1	Acrylonitrile	ND	50	
1634-04-4	Methyl-t-Butyl Ether	ND	50	
156-60-5	Trans-1,2-Dichloroethylene	ND	50	
75-34-3	1,1-dichloroethane	ND	50	
108-05-4	Vinyl Acetate	ND	50	
78-93-3	2-Butanone (MEK)	ND	50	
594-20-7	2,2-Dichloropropane	ND	50	
156-59-2	cis-1,2-Dichloroethylene	ND	50	
67-66-3	Chloroform	ND	50	
74-97-5	Bromochloromethane	ND	50	
109-99-9	Tetrahydrofuran	ND	50	
71-55-6	1,1,1-Trichloroethane	ND	50	
107-06-2	1,2-Dichloroethane	ND	50	
56-23-5	Carbon tetrachloride	ND	50	
71-43-2	Benzene	ND	50	
10061-01-5	c-1,3-dichloropropene	ND	50	
108-88-3	Toluene	ND	50	
10061-02-6	t-1,3-Dichloropropene	ND	50	
79-00-5	1,1,2-Trichloroethane	ND	50	
124-48-1	Dibromochloromethane	ND	50	
108-90-7	Chlorobenzene	ND	50	
563-58-6	1,1-Dichloropropene	ND	50	
79-01-6	Trichloroethylene	ND	50	
78-87-5	1,2-Dichloropropane	ND	50	
75-27-4	Bromodichloromethane	ND	50	
74-95-3	Dibromomethane	ND	50	
108-10-1	4-Methyl-2-Pentanone(MIBK)	ND	50	
142-28-9	1,3-Dichloropropane	ND	50	
127-18-4	Tetrachloroethylene	ND	50	
106-93-4	1,2-Dibromoethane	ND	50	
591-78-6	2-Hexanone	ND	50	
630-20-6	1,1,1,2-Tetrachloroethane	ND	50	

**Turkey Brook - Litchfield, CT**

**Laboratory Blank**

Client Sample ID:	N/A	Lab Sample ID:	N/A
Date of Collection:	N/A	Matrix:	PRODUCT
Date of Preparation:	11/25/2013	Amount Prepared:	5 mL
Date of Analysis:	11/25/2013	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	50
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration ug/L	RL ug/L	Qualifier
100-41-4	Ethylbenzene	ND	50	
108-38-3/106-42-3	M/P Xylene	ND	100	
95-47-6	Ortho Xylene	ND	50	
100-42-5	Styrene	ND	50	
75-25-2	Bromoform	ND	50	
79-34-5	1,1,2,2-Tetrachloroethane	ND	50	
98-82-8	Isopropylbenzene	ND	50	
108-86-1	Bromobenzene	ND	50	
96-18-4	1,2,3-Trichloropropane	ND	50	
103-65-1	N-Propylbenzene	ND	50	
95-49-8	2-Chlorotoluene	ND	50	
106-43-4	4-Chlorotoluene	ND	50	
98-06-6	Tert-Butylbenzene	ND	50	
108-67-8	1,3,5-Trimethylbenzene	ND	50	
95-63-6	1,2,4-Trimethylbenzene	ND	50	
135-98-8	Sec-Butylbenzene	ND	50	
541-73-1	1,3-Dichlorobenzene	ND	50	
99-87-6	Para-Isopropyltoluene	ND	50	
106-46-7	1,4-Dichlorobenzene	ND	50	
95-50-1	1,2-Dichlorobenzene	ND	50	
104-51-8	N-Butylbenzene	ND	50	
96-12-8	1,2-Dibromo-3-Chloropropane	ND	50	
120-82-1	1,2,4-Trichlorobenzene	ND	50	
87-68-3	Hexachlorobutadiene	ND	50	
91-20-3	Naphthalene	ND	50	
87-61-6	1,2,3-Trichlorobenzene	ND	50	

Surrogate Compounds	Recoveries (%)	QC Ranges
1,2-Dichloroethane-D4	109	74 - 136
Toluene-D8	98	85 - 118
1,4-Bromofluorobenzene	97	78 - 111

**Comments:** Method blank is reported in ug/L.

Method blank is associated with all samples in this project.

Turkey Brook - Litchfield, CT

MATRIX SPIKE (MS) RECOVERY

Sample ID: AB45642

PARAMETER	SPIKE ADDED ug/Kg	SAMPLE CONCENTRATION ug/Kg	MS CONCENTRATION ug/Kg	MS % REC	QC LIMITS (% REC)
1,1,1,2-Tetrachloroethane	138,880	ND	140000	100	74 - 124
1,1,1-Trichloroethane	138,880	ND	140000	100	76 - 132
1,1,2,2-Tetrachloroethane	138,880	ND	150000	110	69 - 125
1,1,2-Trichloro-1,2,2-Trifluoroetha	138,880	ND	130000	94	68 - 144
1,1,2-Trichloroethane	138,880	ND	150000	110	75 - 126
1,1-Dichloroethylene	138,880	ND	140000	100	65 - 140
1,1-Dichloropropene	138,880	ND	130000	94	81 - 125
1,1-dichloroethane	138,880	ND	150000	110	77 - 130
1,2,3-Trichlorobenzene	138,880	ND	130000	94	64 - 125
1,2,3-Trichloropropane	138,880	ND	140000	100	68 - 122
1,2,4-Trichlorobenzene	138,880	ND	140000	100	72 - 120
1,2,4-Trimethylbenzene	138,880	ND	140000	100	81 - 125
1,2-Dibromo-3-Chloropropane	138,880	ND	160000	120	54 - 125
1,2-Dibromoethane	138,880	ND	140000	100	73 - 124
1,2-Dichlorobenzene	138,880	ND	140000	100	81 - 116
1,2-Dichloroethane	138,880	ND	150000	110	74 - 130
1,2-Dichloropropane	138,880	ND	140000	100	78 - 120
1,3,5-Trimethylbenzene	138,880	ND	140000	100	81 - 125
1,3-Dichlorobenzene	138,880	ND	130000	94	82 - 117
1,3-Dichloropropane	138,880	ND	140000	100	76 - 123
1,4-Dichlorobenzene	138,880	ND	130000	94	80 - 116
2,2-Dichloropropane	138,880	ND	150000	110	57 - 147
2-Butanone (MEK)	138,880	ND	150000	110	41 - 151
2-Chlorotoluene	138,880	ND	130000	94	82 - 119
2-Hexanone	138,880	ND	170000	120	51 - 148
2-Propanone (acetone)	138,880	ND	140000	100	25 - 161
4-Chlorotoluene	138,880	ND	140000	100	82 - 119
4-Methyl-2-Pentanone(MIBK)	138,880	ND	160000	120	62 - 130
Acrylonitrile	138,880	ND	160000	120	67 - 130
Benzene	138,880	ND	140000	100	82 - 124
Bromobenzene	138,880	ND	130000	94	79 - 119
Bromochloromethane	138,880	ND	150000	110	79 - 125
Bromodichloromethane	138,880	ND	140000	100	71 - 126
Bromoform	138,880	ND	130000	94	56 - 119
Bromomethane	138,880	ND	130000	94	37 - 161
Carbon Disulfide	138,880	ND	140000	100	63 - 134
Carbon tetrachloride	138,880	ND	140000	100	68 - 136
Chlorobenzene	138,880	ND	140000	100	82 - 126
Chloroethane	138,880	ND	150000	110	57 - 148
Chloroform	138,880	ND	150000	110	78 - 130
Chloromethane	138,880	ND	140000	100	56 - 147
Dibromochloromethane	138,880	ND	150000	110	62 - 131
Dibromomethane	138,880	ND	140000	100	75 - 122
Dichlorodifluoromethane	138,880	ND	120000	86	59 - 131
Ethyl Ether	138,880	ND	150000	110	65 - 138
Ethylbenzene	138,880	ND	140000	100	82 - 122
Hexachlorobutadiene	138,880	ND	130000	94	70 - 130

13110054\$VOAHS

**Turkey Brook - Litchfield, CT**

**MATRIX SPIKE (MS) RECOVERY**

Sample ID: AB45642

PARAMETER	SPIKE ADDED ug/Kg	SAMPLE CONCENTRATION ug/Kg	MS CONCENTRATION ug/Kg	MS % REC	QC LIMITS (% REC)
Isopropylbenzene	138,880	ND	140000	100	82 - 125
M/P Xylene	277,760	ND	270000	97	85 - 120
Methyl-t-Butyl Ether	138,880	ND	140000	100	74 - 125
Methylene Chloride	138,880	ND	160000	120	67 - 139
N-Butylbenzene	138,880	ND	150000	110	80 - 129
N-Propylbenzene	138,880	ND	140000	100	81 - 122
Naphthalene	138,880	ND	160000	120	59 - 129
Ortho Xylene	138,880	ND	140000	100	84 - 122
Para-Isopropyltoluene	138,880	ND	140000	100	79 - 129
Sec-Butylbenzene	138,880	ND	140000	100	81 - 126
Styrene	138,880	ND	150000	110	82 - 125
Tert-Butylbenzene	138,880	ND	130000	94	81 - 126
Tetrachloroethylene	138,880	ND	120000	86	74 - 133
Tetrahydrofuran	138,880	ND	160000	120	60 - 132
Toluene	138,880	ND	140000	100	82 - 124
Trans-1,2-Dichloroethylene	138,880	ND	140000	100	79 - 127
Trichloroethylene	138,880	ND	130000	94	76 - 124
Trichlorofluoromethane	138,880	ND	130000	94	65 - 144
Vinyl Acetate	138,880	ND	170000	120	14 - 152
Vinyl Chloride	138,880	ND	140000	100	34 - 142
c-1,3-dichloropropene	138,880	ND	150000	110	68 - 133
cis-1,2-Dichloroethylene	138,880	ND	140000	100	79 - 131
t-1,3-Dichloropropene	138,880	ND	150000	110	65 - 126



Turkey Brook - Litchfield, CT

MATRIX SPIKE DUPLICATE (MSD) RECOVERY

Sample ID:AB45642

PARAMETER	MSD SPIKE ADDED	MSD CONCENTRATION ug/Kg	MSD % REC	RPD %	QC LIMITS RPD
1,1,1,2-Tetrachloroethane	138,880	140000	100	0	40
1,1,1-Trichloroethane	138,880	140000	100	0	40
1,1,2,2-Tetrachloroethane	138,880	150000	110	0	40
1,1,2-Trichloro-1,2,2-Trifluoroetha	138,880	140000	100	6	40
1,1,2-Trichloroethane	138,880	150000	110	0	40
1,1-Dichloroethylene	138,880	140000	100	0	52
1,1-Dichloropropene	138,880	130000	94	0	40
1,1-dichloroethane	138,880	150000	110	0	40
1,2,3-Trichlorobenzene	138,880	130000	94	0	40
1,2,3-Trichloropropane	138,880	140000	100	0	40
1,2,4-Trichlorobenzene	138,880	140000	100	0	40
1,2,4-Trimethylbenzene	138,880	140000	100	0	40
1,2-Dibromo-3-Chloropropane	138,880	160000	120	0	40
1,2-Dibromoethane	138,880	140000	100	0	40
1,2-Dichlorobenzene	138,880	130000	94	6	40
1,2-Dichloroethane	138,880	150000	110	0	40
1,2-Dichloropropane	138,880	140000	100	0	40
1,3,5-Trimethylbenzene	138,880	130000	94	6	40
1,3-Dichlorobenzene	138,880	130000	94	0	40
1,3-Dichloropropane	138,880	140000	100	0	40
1,4-Dichlorobenzene	138,880	130000	94	0	40
2,2-Dichloropropane	138,880	150000	110	0	40
2-Butanone (MEK)	138,880	170000	120	9	40
2-Chlorotoluene	138,880	130000	94	0	40
2-Hexanone	138,880	170000	120	0	40
2-Propanone (acetone)	138,880	150000	110	10	40
4-Chlorotoluene	138,880	130000	94	6	40
4-Methyl-2-Pentanone(MIBK)	138,880	160000	120	0	40
Acrylonitrile	138,880	160000	120	0	40
Benzene	138,880	140000	100	0	24
Bromobenzene	138,880	130000	94	0	40
Bromochloromethane	138,880	140000	100	10	40
Bromodichloromethane	138,880	140000	100	0	40
Bromoform	138,880	120000	86	9	40
Bromomethane	138,880	130000	94	0	40
Carbon Disulfide	138,880	140000	100	0	40
Carbon tetrachloride	138,880	140000	100	0	40
Chlorobenzene	138,880	140000	100	0	34
Chloroethane	138,880	150000	110	0	40
Chloroform	138,880	150000	110	0	40
Chloromethane	138,880	130000	94	6	40
Dibromochloromethane	138,880	150000	110	0	40
Dibromomethane	138,880	130000	94	6	40
Dichlorodifluoromethane	138,880	120000	86	0	40
Ethyl Ether	138,880	150000	110	0	40
Ethylbenzene	138,880	130000	94	6	40
Hexachlorobutadiene	138,880	130000	94	0	40
Isopropylbenzene	138,880	130000	94	6	40

**Turkey Brook - Litchfield, CT**

**MATRIX SPIKE DUPLICATE (MSD) RECOVERY**

Sample ID:AB45642

PARAMETER	MSD SPIKE ADDED	MSD CONCENTRATION ug/Kg	MSD % REC	RPD %	QC LIMITS RPD
M/P Xylene	277,760	260000	94	3	40
Methyl-t-Butyl Ether	138,880	150000	110	10	40
Methylene Chloride	138,880	150000	110	9	40
N-Butylbenzene	138,880	150000	110	0	40
N-Propylbenzene	138,880	130000	94	6	40
Naphthalene	138,880	160000	120	0	40
Ortho Xylene	138,880	130000	94	6	40
Para-Isopropyltoluene	138,880	140000	100	0	40
Sec-Butylbenzene	138,880	140000	100	0	40
Styrene	138,880	140000	100	10	40
Tert-Butylbenzene	138,880	130000	94	0	40
Tetrachloroethylene	138,880	120000	86	0	40
Tetrahydrofuran	138,880	160000	120	0	40
Toluene	138,880	140000	100	0	33
Trans-1,2-Dichloroethylene	138,880	140000	100	0	40
Trichloroethylene	138,880	130000	94	0	27
Trichlorofluoromethane	138,880	130000	94	0	40
Vinyl Acetate	138,880	170000	120	0	40
Vinyl Chloride	138,880	140000	100	0	40
c-1,3-dichloropropene	138,880	140000	100	10	40
cis-1,2-Dichloroethylene	138,880	140000	100	0	40
t-1,3-Dichloropropene	138,880	150000	110	0	40

**Turkey Brook - Litchfield, CT**

**Laboratory Duplicate Results**

Sample ID: AB45642

PARAMETER	SAMPLE RESULT ug/Kg	SAMPLE DUPLICATE RESULT ug/Kg	PRECISION RPD %	QC LIMITS
1,1,1,2-Tetrachloroethane	ND	ND	ND	40
1,1,1-Trichloroethane	ND	ND	ND	40
1,1,2,2-Tetrachloroethane	ND	ND	ND	40
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ND	ND	40
1,1,2-Trichloroethane	ND	ND	ND	40
1,1-Dichloroethylene	ND	ND	ND	40
1,1-Dichloropropene	ND	ND	ND	40
1,1-dichloroethane	ND	ND	ND	40
1,2,3-Trichlorobenzene	ND	ND	ND	40
1,2,3-Trichloropropane	ND	ND	ND	40
1,2,4-Trichlorobenzene	ND	ND	ND	40
1,2,4-Trimethylbenzene	ND	ND	ND	40
1,2-Dibromo-3-Chloropropane	ND	ND	ND	40
1,2-Dibromoethane	ND	ND	ND	40
1,2-Dichlorobenzene	ND	ND	ND	40
1,2-Dichloroethane	ND	ND	ND	40
1,2-Dichloropropane	ND	ND	ND	40
1,3,5-Trimethylbenzene	ND	ND	ND	40
1,3-Dichlorobenzene	ND	ND	ND	40
1,3-Dichloropropane	ND	ND	ND	40
1,4-Dichlorobenzene	ND	ND	ND	40
2,2-Dichloropropane	ND	ND	ND	40
2-Butanone (MEK)	ND	ND	ND	40
2-Chlorotoluene	ND	ND	ND	40
2-Hexanone	ND	ND	ND	40
2-Propanone (acetone)	ND	ND	ND	40
4-Chlorotoluene	ND	ND	ND	40
4-Methyl-2-Pentanone(MIBK)	ND	ND	ND	40
Acrylonitrile	ND	ND	ND	40
Benzene	ND	ND	ND	40
Bromobenzene	ND	ND	ND	40
Bromochloromethane	ND	ND	ND	40
Bromodichloromethane	ND	ND	ND	40
Bromoform	ND	ND	ND	40
Bromomethane	ND	ND	ND	40
Carbon Disulfide	ND	ND	ND	40
Carbon tetrachloride	ND	ND	ND	40
Chlorobenzene	ND	ND	ND	40
Chloroethane	ND	ND	ND	40
Chloroform	ND	ND	ND	40
Chloromethane	ND	ND	ND	40
Dibromochloromethane	ND	ND	ND	40
Dibromomethane	ND	ND	ND	40
Dichlorodifluoromethane	ND	ND	ND	40
Ethyl Ether	ND	ND	ND	40
Ethylbenzene	ND	ND	ND	40
Hexachlorobutadiene	ND	ND	ND	40
Isopropylbenzene	ND	ND	ND	40
M/P Xylene	ND	ND	ND	40
Methyl-t-Butyl Ether	ND	ND	ND	40

**Turkey Brook - Litchfield, CT**

**Laboratory Duplicate Results**

Sample ID: AB45642

PARAMETER	SAMPLE RESULT ug/Kg	SAMPLE DUPLICATE RESULT ug/Kg	PRECISION RPD %	QC LIMITS
Methylene Chloride	ND	ND	ND	40
N-Butylbenzene	ND	ND	ND	40
N-Propylbenzene	ND	ND	ND	40
Naphthalene	ND	ND	ND	40
Ortho Xylene	ND	ND	ND	40
Para-Isopropyltoluene	ND	ND	ND	40
Sec-Butylbenzene	ND	ND	ND	40
Styrene	ND	ND	ND	40
Tert-Butylbenzene	ND	ND	ND	40
Tetrachloroethylene	ND	ND	ND	40
Tetrahydrofuran	ND	ND	ND	40
Toluene	ND	ND	ND	40
Trans-1,2-Dichloroethylene	ND	ND	ND	40
Trichloroethylene	ND	ND	ND	40
Trichlorofluoromethane	ND	ND	ND	40
Vinyl Acetate	ND	ND	ND	40
Vinyl Chloride	ND	ND	ND	40
c-1,3-dichloropropene	ND	ND	ND	40
cis-1,2-Dichloroethylene	ND	ND	ND	40
t-1,3-Dichloropropene	ND	ND	ND	40

Turkey Brook - Litchfield, CT

Laboratory Fortified Blank (LFB) Results

PARAMETER	LFB AMOUNT SPIKED ug/Kg	LFB RESULT ug/Kg	LFB RECOVERY %	QC LIMITS %
1,1,1,2-Tetrachloroethane	20	20.4	102	77 - 122
1,1,1-Trichloroethane	20	21.8	109	80 - 128
1,1,2,2-Tetrachloroethane	20	21.8	109	73 - 118
1,1,2-Trichloro-1,2,2-Trifluoroeth	20	19.4	97	59 - 146
1,1,2-Trichloroethane	20	22.1	111	79 - 117
1,1-Dichloroethylene	20	20.4	102	70 - 130
1,1-Dichloropropene	20	19.7	99	79 - 123
1,1-dichloroethane	20	21.8	109	81 - 122
1,2,3-Trichlorobenzene	20	18.5	93	70 - 119
1,2,3-Trichloropropane	20	20.9	105	73 - 114
1,2,4-Trichlorobenzene	20	18.2	91	74 - 120
1,2,4-Trimethylbenzene	20	20.0	100	79 - 123
1,2-Dibromo-3-Chloropropane	20	22.6	113	63 - 124
1,2-Dibromoethane	20	20.4	102	79 - 116
1,2-Dichlorobenzene	20	18.8	94	77 - 117
1,2-Dichloroethane	20	21.1	106	75 - 124
1,2-Dichloropropane	20	20.1	101	80 - 117
1,3,5-Trimethylbenzene	20	19.7	99	80 - 122
1,3-Dichlorobenzene	20	18.5	93	78 - 117
1,3-Dichloropropane	20	20.7	104	79 - 116
1,4-Dichlorobenzene	20	18.7	94	77 - 115
2,2-Dichloropropane	20	22.0	110	64 - 152
2-Butanone (MEK)	20	23.0	115	55 - 144
2-Chlorotoluene	20	18.8	94	79 - 119
2-Hexanone	20	24.6	123	58 - 147
2-Propanone (acetone)	20	24.0	120	37 - 168
4-Chlorotoluene	20	19.6	98	78 - 120
4-Methyl-2-Pentanone(MIBK)	20	22.4	112	68 - 125
Acrylonitrile	20	22.8	114	68 - 124
Benzene	20	20.1	101	80 - 120
Bromobenzene	20	18.5	93	80 - 115
Bromochloromethane	20	20.8	104	81 - 120
Bromodichloromethane	20	21.0	105	77 - 125
Bromoform	20	19.6	98	62 - 127
Bromomethane	20	18.0	90	60 - 139
Carbon Disulfide	20	21.4	107	73 - 129
Carbon tetrachloride	20	21.7	109	73 - 136
Chlorobenzene	20	21.0	105	82 - 119
Chloroethane	20	21.1	106	69 - 130
Chloroform	20	21.8	109	80 - 122
Chloromethane	20	20.2	101	65 - 129
Dibromochloromethane	20	23.5	118	71 - 129
Dibromomethane	20	20.0	100	79 - 115
Dichlorodifluoromethane	20	17.9	90	69 - 126
Ethyl Ether	20	22.3	112	69 - 127
Ethylbenzene	20	19.9	100	80 - 121
Hexachlorobutadiene	20	16.9	85	72 - 124
Isopropylbenzene	20	19.9	100	79 - 124
M/P Xylene	40	39.4	99	81 - 120
Methyl-t-Butyl Ether	20	21.0	105	78 - 120
Methylene Chloride	20	22.2	111	73 - 129
N-Butylbenzene	20	20.5	103	78 - 126
N-Propylbenzene	20	20.0	100	78 - 122



**Turkey Brook - Litchfield, CT**

**Laboratory Fortified Blank (LFB) Results**

PARAMETER	LFB AMOUNT SPIKED ug/Kg	LFB RESULT ug/Kg	LFB RECOVERY %	QC LIMITS %
Naphthalene	20	21.3	107	66 - 124
Ortho Xylene	20	19.5	98	81 - 121
Para-Isopropyltoluene	20	20.1	101	77 - 127
Sec-Butylbenzene	20	20.0	100	79 - 124
Styrene	20	20.9	105	82 - 122
Tert-Butylbenzene	20	19.7	99	78 - 124
Tetrachloroethylene	20	18.4	92	77 - 125
Tetrahydrofuran	20	22.2	111	67 - 124
Toluene	20	20.7	104	81 - 120
Trans-1,2-Dichloroethylene	20	20.3	102	80 - 121
Trichloroethylene	20	19.2	96	80 - 117
Trichlorofluoromethane	20	20.0	100	68 - 137
Vinyl Acetate	20	24.3	122	25 - 150
Vinyl Chloride	20	22.3	112	67 - 134
c-1,3-dichloropropene	20	22.2	111	73 - 133
cis-1,2-Dichloroethylene	20	20.9	105	82 - 122
t-1,3-Dichloropropene	20	23.4	117	69 - 127

**Comments:**

Turkey Brook - Litchfield, CT

LABORATORY FORTIFIED DUPLICATE (LFB Dup) RECOVERY

COMPOUND	LFB Dup CONCENTRATION ug/Kg	LFB Dup RECOVERY %	RPD %	QC LIMITS RPD
1,1,1,2-Tetrachloroethane	19.2	96	6	50
1,1,1-Trichloroethane	21.1	106	3	50
1,1,2,2-Tetrachloroethane	21.8	109	0	50
1,1,2-Trichloro-1,2,2-Trifluoroetha	19.0	95	2	50
1,1,2-Trichloroethane	21.3	107	4	50
1,1-Dichloroethylene	20.2	101	1	52
1,1-Dichloropropene	19.2	96	3	50
1,1-dichloroethane	21.6	108	1	50
1,2,3-Trichlorobenzene	19.2	96	4	50
1,2,3-Trichloropropane	21.3	107	2	50
1,2,4-Trichlorobenzene	19.2	96	5	50
1,2,4-Trimethylbenzene	20.1	101	1	50
1,2-Dibromo-3-Chloropropane	23.4	117	4	50
1,2-Dibromoethane	20.8	104	2	50
1,2-Dichlorobenzene	19.1	96	2	50
1,2-Dichloroethane	21.4	107	1	50
1,2-Dichloropropane	20.1	101	0	50
1,3,5-Trimethylbenzene	19.8	99	1	50
1,3-Dichlorobenzene	18.7	94	1	50
1,3-Dichloropropane	20.4	102	2	50
1,4-Dichlorobenzene	18.6	93	1	50
2,2-Dichloropropane	21.5	108	2	50
2-Butanone (MEK)	24.4	122	6	50
2-Chlorotoluene	19.2	96	2	50
2-Hexanone	25.9	130	5	50
2-Propanone (acetone)	25.7	129	7	50
4-Chlorotoluene	19.7	99	1	50
4-Methyl-2-Pentanone(MIBK)	23.1	116	3	50
Acrylonitrile	23.0	115	1	50
Benzene	19.8	99	2	50
Bromobenzene	19.2	96	4	50
Bromochloromethane	21.1	106	1	50
Bromodichloromethane	20.5	103	2	50
Bromoform	18.5	93	6	50
Bromomethane	18.5	93	3	50
Carbon Disulfide	20.0	100	7	50
Carbon tetrachloride	20.8	104	4	50
Chlorobenzene	20.5	103	2	34
Chloroethane	20.5	103	3	50
Chloroform	21.6	108	1	50
Chloromethane	20.2	101	0	50
Dibromochloromethane	22.3	112	5	50
Dibromomethane	20.0	100	0	50
Dichlorodifluoromethane	17.4	87	3	50
Ethyl Ether	22.1	111	1	50
Ethylbenzene	19.6	98	2	50
Hexachlorobutadiene	16.9	85	0	50
Isopropylbenzene	20.0	100	1	50
M/P Xylene	38.3	96	3	50
Methyl-t-Butyl Ether	21.5	108	2	50
Methylene Chloride	22.0	110	1	50

13110054\$VOAHS

**Turkey Brook - Litchfield, CT**

**LABORATORY FORTIFIED DUPLICATE (LFB Dup) RECOVERY**

COMPOUND	LFB Dup CONCENTRATION ug/Kg	LFB Dup RECOVERY %	RPD %	QC LIMITS RPD
N-Butylbenzene	20.4	102	1	50
N-Propylbenzene	19.9	100	1	50
Naphthalene	22.2	111	4	50
Ortho Xylene	19.5	98	0	50
Para-Isopropyltoluene	20.1	101	0	50
Sec-Butylbenzene	19.8	99	1	50
Styrene	20.5	103	2	50
Tert-Butylbenzene	19.8	99	1	50
Tetrachloroethylene	19.2	96	4	50
Tetrahydrofuran	22.4	112	1	50
Toluene	20.3	102	2	50
Trans-1,2-Dichloroethylene	20.1	101	1	50
Trichloroethylene	19.5	98	2	27
Trichlorofluoromethane	18.6	93	7	50
Vinyl Acetate	23.9	120	2	50
Vinyl Chloride	20.7	104	7	50
c-1,3-dichloropropene	21.5	108	3	50
cis-1,2-Dichloroethylene	20.9	105	0	50
t-1,3-Dichloropropene	21.8	109	7	50

**Samples in Batch:** AB45642

13110054

## Turkey Brook

Contact Name: Mia Pasquerella  
Contact Phone: 6179181120

No: 11/22/13-0001

Cooler #.:

Lab: US EPA NERL  
Lab Phone:

[illegible]

**Special Instructions:** Please forward results to OSC Pasquerella and OSC Bazenas

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United States Environmental Protection Agency  
Office of Environmental Measurement & Evaluation  
60 Westview Street  
Lexington, MA 02421-3185

Page 1 of 3

## Laboratory Results

December 02, 2013

Mia Pasquerella - Mail Code OSRR02-2  
US EPA New England R1

Project Number: 13110054  
Project: Turkey Brook - Litchfield, CT  
Analysis: Oil Identification  
Analyst: Paul Carroll

### Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I SOP, MISOILID3.SOP.

Soil and product samples were extracted using cyclohexane as a solvent. In most cases Pressurized Fluid Extraction is used on soil samples, however if raw product is visible both soil and product samples are extracted using a waste dilution extraction. Aqueous samples are extracted using a separatory funnel technique with dichloromethane. The dichloromethane extract is concentrated and exchanged to cyclohexane. The extracts were analyzed using an Hewlett Packard 5890 gas chromatograph equipped with a J&W DB-1HT 30 meter 0.32mm ID capillary column. Detection was by Flame Ionization Detector.

Date Samples Received by the Laboratory: 11/25/2013

Data were reviewed in accordance with the internal verification procedures described in the EPA New England OEME Chemistry QA Plan.

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

If you have any questions please call me at 617.918.8340

Sincerely,

Digitally signed by Dan Boudreau

DN: cn=Dan Boudreau, o=EPA, ou=EIA,  
email=boudreau.dan@epa.gov, c=US

Date: 2013.12.02 11:57:34 -05'00'

13110054OILID

**Turkey Brook - Litchfield, CT**

**Oil Identification**

Matrix: PRODUCT

Field ID	Lab ID	Collected	Extracted	Analysis	Product	Hydrocarbon Range	Qualifier
13090009-0001	AB45642	11/22/2013	11/26/2013	11/26/2013	Motor Oil	GRO	MATCH

**Comments:** The sample chromatogram contained two characteristic 'humps'. One appeared to be a lubricating oil (i.e. motor oil, cutting oil) in the C18 to C38 hydrocarbon range. The other appeared to be a lighter compound (i.e. petroleum distillate) in the C10 to C13 hydrocarbon range (Gasoline Range Organics).

13110054

## Turkey Brook

No: 11/22/13-0001

Cooler #:

Lab: US EPA NERL

Lab Phone:

[illegible]

**Special Instructions:** Please forward results to OSC Pasquerella and OSC Bazenas

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## Laboratory Report

December 03, 2013

Mia Pasquerella - Mail Code OSRR02-2  
US EPA New England R1

Project Number: 13110054  
Project: Turkey Brook - Litchfield, CT  
Analysis: PCBs in Oils  
EPA Chemist: Paul Carroll

Date Samples Received by the Laboratory: 11/25/2013

### Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I SOP, PCBOIL1.SOP.

The SOP is based on EPA SW-846 Method 8082

PCBs or Aroclors were extracted from oil and solvent soluble samples using a waste dilution technique using hexane as a solvent. Samples were then purified to reduce interferences by using a sulfuric acid clean-up followed by a florisil column elution. Sample extracts were directly injected into an Agilent 6890 gas chromatograph system equipped with dual 30M x 0.25mm capillary columns DB-5 and DB-1701. Detection is by electron capture detectors, and quantitation is performed using an external standard calibration method. This procedure follows EPA SW-846 Method 8082, Rev 0, December 1996.

Data were reviewed in accordance with the internal verification procedures described in the EPA New England Quality Manual for NERL.

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

If you have any questions please call me at 617-918-8340 .

Sincerely,

Digitally signed by Dan Boudreau  
DN: cn=Dan Boudreau, o=EPA,  
ou=EIA,  
email=boudreau.dan@epa.gov, c=US  
Date: 2013.12.03 11:31:01 -05'00'

13110054\$PCBP

**Qualifiers:**

<b>RL</b>	Reporting limit
<b>ND</b>	Not Detected above reporting limit
<b>NA</b>	Not Applicable
<b>NC</b>	Not calculated since analyte concentration is ND
<b>J1</b>	Estimated value due to MS recovery outside acceptance criteria
<b>J2</b>	Estimated value due to LFB result outside acceptance criteria
<b>J3</b>	Estimated value due to RPD result outside acceptance criteria
<b>J4</b>	Estimated value due to LCS result outside acceptance criteria
<b>B</b>	Analyte is associated with the lab blank or trip blank contamination. Values are qualified when the observed concentration of the contamination in the sample extract is less than 10 times the concentration in the blank.
<b>R</b>	No recovery was calculated since the analyte concentration is greater than four times the spike level.



**Turkey Brook - Litchfield, CT**

**PCBs in Oils**

Client Sample ID: 13090009-0001  
Date of Collection: 11/22/2013  
Date of Preparation: 11/25/2013  
Date of Analysis: 11/26/2013  
Dry Weight Prepared: N/A  
Wet Weight Prepared: 0.116 grams

Lab Sample ID: AB45642  
Matrix: PRODUCT  
Amount Prepared: N/A  
Percent Solids: N/A  
Extract Dilution: 1  
pH: N/A

<b>CAS Number</b>	<b>Compound</b>	<b>Concentration mg/Kg</b>	<b>RL mg/Kg</b>	<b>Qualifier</b>
12674-11-2	Aroclor-1016	ND	9.0	
11104-28-2	Aroclor-1221	ND	9.0	
11141-16-5	Aroclor-1232	ND	9.0	
53469-21-9	Aroclor-1242	ND	9.0	
12672-29-6	Aroclor-1248	ND	9.0	
11097-69-1	Aroclor-1254	ND	9.0	
11096-82-5	Aroclor-1260	ND	9.0	
11100-14-4	Aroclor-1262	ND	9.0	
37324-23-5	Aroclor-1268	ND	9.0	

<b>Surrogate Compounds</b>	<b>Recoveries (%)</b>	<b>QC Ranges</b>
2,4,5,6-Tetrachloro-m-xylene	84	59 - 108
Decachlorobiphenyl	85	54 - 100

**Comments:**

**Turkey Brook - Litchfield, CT**

**Laboratory Blank**

Client Sample ID:	N/A	Lab Sample ID:	N/A
Date of Collection:	N/A	Matrix:	PRODUCT
Date of Preparation:	11/25/2013	Amount Prepared:	N/A
Date of Analysis:	11/26/2013	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	0.100 grams	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
12674-11-2	Aroclor-1016	ND	10	
11104-28-2	Aroclor-1221	ND	10	
11141-16-5	Aroclor-1232	ND	10	
53469-21-9	Aroclor-1242	ND	10	
12672-29-6	Aroclor-1248	ND	10	
11097-69-1	Aroclor-1254	ND	10	
11096-82-5	Aroclor-1260	ND	10	
11100-14-4	Aroclor-1262	ND	10	
37324-23-5	Aroclor-1268	ND	10	

Surrogate Compounds	Recoveries (%)	QC Ranges
2,4,5,6-Tetrachloro-m-xylene	82	55 - 106
Decachlorobiphenyl	103	47 - 120

**Comments:**

Turkey Brook - Litchfield, CT

MATRIX SPIKE (MS) RECOVERY

Sample ID: AB45642

PARAMETER	SPIKE ADDED mg/Kg	SAMPLE CONCENTRATION mg/Kg	MS CONCENTRATION mg/Kg	MS % REC	QC LIMITS (% REC)
Aroclor-1016	52.2	ND	43.1	83	70 - 130
Aroclor-1260	52.2	ND	36.6	70	50 - 127

Turkey Brook - Litchfield, CT

MATRIX SPIKE DUPLICATE (MSD) RECOVERY

Sample ID:AB45642

PARAMETER	MSD SPIKE ADDED	MSD CONCENTRATION mg/Kg	MSD % REC	RPD %	QC LIMITS RPD
Aroclor-1016	54.5	46.9	86	4	50
Aroclor-1260	54.5	45.4	83	17	50

Turkey Brook - Litchfield, CT

Laboratory Duplicate Results

Sample ID: AB45642

PARAMETER	SAMPLE RESULT mg/Kg	SAMPLE DUPLICATE RESULT mg/Kg	PRECISION RPD %	QC LIMITS
Aroclor-1016	ND	ND		50
Aroclor-1221	ND	ND		50
Aroclor-1232	ND	ND		50
Aroclor-1242	ND	ND		50
Aroclor-1248	ND	ND		50
Aroclor-1254	ND	ND		50
Aroclor-1260	ND	ND		50
Aroclor-1262	ND	ND		50
Aroclor-1268	ND	ND		50

**Turkey Brook - Litchfield, CT**

**Laboratory Fortified Blank (LFB) Results**

PARAMETER	LFB AMOUNT SPIKED mg/kg	LFB RESULT mg/kg	LFB RECOVERY %	QC LIMITS %
Aroclor-1016	60	68.5	114	70 - 130
Aroclor-1260	60	69.0	115	70 - 130

**Comments:**

**Samples in Batch:** AB45642



13110054

## Turkey Brook

No: 11/22/13-0001

Cooler #:

Lab: US EPA NERL

Lab Phone:

[illegible]

**Special Instructions:** Please forward results to OSC Pasquerella and OSC Bazenas

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United States Environmental Protection Agency  
Office of Environmental Measurement & Evaluation  
11 Technology Drive  
North Chelmsford, MA 01863-2431

Page 1 of 7

Laboratory Report

December 06, 2013

Mia Pasquerella - Mail Code OSRR02-2  
US EPA New England R1

Project Number: 13110054  
Project: Turkey Brook - Litchfield, CT  
Analysis: Metals by XRF  
EPA Chemist: Janet Paquin  
JP 12/6/13

Date Samples Received by the Laboratory: 11/25/2013

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I SOP, EIASOP-INGXRF0.

Samples were screened using a PANanalytical Epsilon 5 energy dispersive x-ray fluorescence (XRF) spectrometer. The spectrometer is a high resolution energy dispersive x-ray fluorescence spectrometer. It uses both direct and secondary targets to qualitatively and quantitatively analyze elements.

Data were reviewed in accordance with the internal verification procedures described in the EPA New England Quality Manual for NERL.

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

If you have any questions please call me at 617-918-8340 .

Sincerely,

Digitally signed by Dan Boudreau  
DN: cn=Dan Boudreau, o=EPA,  
ou=EIA,  
email=boudreau.dan@epa.gov, c=US  
Date: 2013.12.10 13:28:46 -05'00'

13110054\$XRF

**Qualifiers:**

<b>RL</b>	Reporting limit
<b>ND</b>	Not Detected above reporting limit
<b>NA</b>	Not Applicable
<b>NC</b>	Not calculated since analyte concentration is ND
<b>J1</b>	Estimated value due to MS recovery outside acceptance criteria
<b>J2</b>	Estimated value due to LFB result outside acceptance criteria
<b>J3</b>	Estimated value due to RPD result outside acceptance criteria
<b>J4</b>	Estimated value due to standard reference material result outside acceptance criteria
<b>B</b>	Analyte is associated with the lab blank or trip blank contamination. Values are qualified when the observed concentration of the contamination in the sample extract is less than 10 times the concentration in the blank.
<b>R</b>	No recovery was calculated since the analyte concentration is greater than four times the spike level.

Sample results are in mg/Kg as received.

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NEW ENGLAND LABORATORY

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Turkey Brook - Litchfield, CT

Metals by XRF

Client Sample ID: 13090009-0001

Date of Collection: 11/22/2013

Date of Preparation: 12/06/2013

Date of Analysis: 12/06/2013

Dry Weight Prepared:

Wet Weight Prepared:

Lab Sample ID: AB45642

Matrix: PRODUCT

Amount Prepared:

Percent Solids:

Extract Dilution:

pH:

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-22-4	Silver	ND	10	J4
7440-38-2	Arsenic	ND	10	
7440-39-3	Barium	ND	50	
7440-43-9	Cadmium	ND	10	
7440-47-3	Chromium	ND	40	
7439-97-6	Mercury	ND	20	
7439-92-1	Lead	52	5.0	
7782-49-2	Selenium	ND	10	

Comments:

13110054\$XRF

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NEW ENGLAND LABORATORY

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Turkey Brook - Litchfield, CT

Laboratory Duplicate Results

Sample ID: AB45642

PARAMETER	SAMPLE RESULT mg/Kg	SAMPLE DUPLICATE RESULT mg/Kg	PRECISION RPD %	QC LIMITS
Arsenic	ND	ND	NC	35
Barium	ND	ND	NC	35
Cadmium	ND	ND	NC	35
Chromium	ND	ND	NC	35
Lead	52	54	4	35
Mercury	ND	ND	NC	35
Selenium	ND	ND	NC	35
Silver	ND	ND	NC	35

Samples in Batch: AB45642



p. 1 of 2

Quality Control Check Sample Results for LiquidsConostan S-21 Oil Standard (12/06/13 #1)

<u>Parameter</u>	<u>Found*</u>	<u>Certified Value*</u>	<u>% Recovery</u>
Ag	75	100	75
Ba	100	100	100
Cd	71	100	71
Cr	120	100	120
Pb	78	100	78

Conostan S-21 Oil Standard (12/06/13 #2)

<u>Parameter</u>	<u>Found*</u>	<u>Certified Value*</u>	<u>% Recovery</u>
Ag	74	100	74
Ba	99	100	99
Cd	71	100	71
Cr	120	100	120
Pb	78	100	78

\*Results are in mg/Kg

p. 2 of 2

Quality Control Check Sample Results for Liquids (cont.)Conostan 100 ppm As Oil Standard (12/06/13)

<u>Parameter</u>	<u>Found*</u>	<u>Certified Value*</u>	<u>% Recovery</u>
As	48	100	48**

Conostan 100 ppm Hg Oil Standard (12/06/13)

<u>Parameter</u>	<u>Found*</u>	<u>Certified Value*</u>	<u>% Recovery</u>
Hg	100	100	100

Conostan 100 ppm Se Oil Standard (12/06/132)

<u>Parameter</u>	<u>Found*</u>	<u>Certified Value*</u>	<u>% Recovery</u>
Se	80	100	80

\*Results are in mg/Kg

\*\* This result is outside the acceptance range of  
70 - 130 percent.

13110054

## Turkey Brook

Contact Name: Mia Pasquerella  
Contact Phone: 6179181120

No: 11/22/13-0001

Cooler #:

Lab: US EPA NERL  
Lab Phone:

[illegible]

**Special Instructions:** Please forward results to OSC Pasquerella and OSC Bazenas

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

[illegible]

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