



pennsylvania

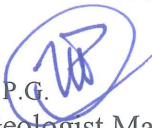
DEPARTMENT OF ENVIRONMENTAL PROTECTION

SOUTHEAST REGIONAL OFFICE

MEMO

TO Stephan Sinding
Regional Manager, Environmental Cleanup and Brownfields

FROM C. David Brown, P.G. CDB
Licensed Professional Geologist

THROUGH  Walter Payne, P.G.
Professional Geologist Manager

DATE April 30, 2015

RE ECB: Land Recycling Program and Tanks Program
Act 2 and Corrective Action Technical Memo Summary
Philadelphia Refinery, Belmont Terminal, and Marcus Hook Industrial Complex
Risk Assessment Report—Lead in Soil

Site Identification and Property Owner Name and Address:

| Philadelphia Refinery | Belmont Terminal | Marcus Hook Industrial Complex |
|--|---|---|
| eFACTS PF No. 780190 Tank Facility IDs 51-11554, 51-36558, 51-19781, 51-11557 3144 West Passyunk Avenue City of Philadelphia Philadelphia County Property Owner: Philadelphia Energy Solutions Refining and Marketing LLC 3144 Passyunk Ave. Philadelphia, PA 19145 Location: 39.9142°N, 75.2005°W | eFACTS PF No. 780561 Tank Facility ID 51-03525 2700 West Passyunk Avenue City of Philadelphia Philadelphia County Property Owner: Sunoco Partners Marketing & Terminals 4041 Market St. Aston, PA 19014 Location: 39.9205°N, 75.1931°W | eFACTS PF No. 780192 Tank Facility ID 23-14224 100 Green Street Marcus Hook Borough Delaware County Property Owner: Sunoco Partners Marketing & Terminals 4041 Market St. Aston, PA 19014 Location: 39.8150°N, 75.4230°W |

Remediator Name and Address:

Evergreen Resources Management Operations
2 Righter Parkway, Suite 200
Wilmington, DE 19803

Act 2 Standard(s) Sought:

Soil—nonresidential site-specific standard

Site Size:

| | |
|--------------------------------|-------------|
| Philadelphia Refinery | ~1295 acres |
| Belmont Terminal | ~100 acres |
| Marcus Hook Industrial Complex | ~590 acres |

Project Site History:

Petroleum refining began at the Philadelphia Refinery circa 1870. The facility consisted of two refineries, Point Breeze operated by Atlantic Petroleum Corporation (formerly ARCO) and Girard Point by Chevron (formerly Gulf). Sunoco purchased these two refineries in 1988 and 1994 and consolidated them into a single facility. In 2012 Sunoco sold the refinery to the Carlyle Group and entered a joint venture to operate it as Philadelphia Energy Solutions (PES). Sunoco, Inc. is now a subsidiary of Energy Transfer Partners, L.P.

The Philadelphia Refinery can process up to 330,000 barrels a day of crude oil. It produces gasoline, diesel, jet fuel, kerosene, home heating oil, and other petroleum liquids. The facility consists of multiple process units, above-ground storage tanks, pipelines, as well as truck, railcar, and barge transfer equipment. Truck loading of fuel is performed adjacent to the refinery at the Belmont Terminal which is owned and operated by Sunoco Logistics Partners L.P.

Sunoco constructed and began operating the Marcus Hook Refinery in 1902. For over 100 years it produced gasoline, diesel, heating oil, and other petroleum fuels as well as chemicals. The facility was shut down in December 2011. Sunoco Logistics acquired the property in May 2013 and renamed it the Marcus Hook Industrial Complex. They are constructing ethane and propane storage, processing, and transfer equipment.

Site Findings:

Soil investigations at the sites have identified lead exceedences of DEP's nonresidential direct contact MSC of 1000 mg/kg for surface soil (0–2'). This standard was derived using a method described in §250.306(e). Evergreen has chosen to develop a site-specific numerical standard for lead in soil using a more recent formulation, EPA's Adult Lead Methodology (ALM). Unlike most other environmental contaminants, the human health risk from lead is quantified by the blood lead concentration, and cumulative risks are not evaluated.

The ALM accounts for ingestion of lead-contaminated soil-derived dust, whether indoors or outdoors. The target blood lead concentration is 10 µg/dL, which is considered to be a level in a pregnant worker above which fetal neurological damage could occur. The methodology estimates an average soil lead concentration not expected to result in a greater than 5% probability of the blood lead concentration exceeding 10 µg/dL in a female worker of child-bearing age. As this is the most sensitive population, the soil standard should be protective of all other workers.

Langan calculated a site-specific lead soil standard using the ALM with EPA's default input parameters. This included the 2009 updates to the baseline blood lead concentration and geometric standard deviation. The ALM result is 2240 mg/kg.

Langan assessed uncertainties in the methodology, including the representativeness of the soil data to be compared to the standard, the exposure assessment, and the bioavailability of lead. They concluded that the approach is conservative, and therefore the site-specific standard should be protective.

Site Cleanup History:

NIR Received Date

Philadelphia Refinery November 17, 2014

Belmont Terminal October 6, 2014

Marcus Hook Industrial Complex January 15, 2015

RAR Received Date February 26, 2015

The three sites are being remediated by Evergreen, a subsidiary of Sunoco. The original NIR for the Philadelphia Refinery was received in October 2006, and the original NIR for the MHIC was received in October 2011. Both facilities are in the One Cleanup Program for joint RCRA and Act 2 actions. Reports are submitted to satisfy both Act 2 and Act 32 obligations. Remedial investigations are in progress for all areas of the sites, and reports have been submitted describing these activities and active remediation systems.

Discussion of Cleanup Involved and Demonstration of Attainment:

Site characterization of soil at the facilities is ongoing. The calculation of a site-specific numerical standard for lead is not dependent on knowledge of the distributions and concentrations of lead at the sites because the ALM utilizes a target blood lead concentration. Data will be compared to the site-specific standard. Evergreen intends to remediate exceedences or eliminate complete exposure pathways. These actions will be proposed in future cleanup plans.

DEP Final Action Approval/Disapproval Letter:

I recommend approving the risk assessment report for a nonresidential site-specific numerical standard of **2240 mg/kg lead** in surface soil.

| | | | |
|-------------------------|---|---------------|--|
| DEP Contact: | C. David Brown | Phone: | 484.250.5796 |
| Site Contact: | Jim Oppenheim, Evergreen Chuck Barksdale, PES Brad Fish, Sunoco Logistics | Phone: | 302.477.0192 215.339.2074 610.859.5412 |
| Site Consultant: | Kevin McKeever, Langan Engineering & Environmental Services | Phone: | 215.491-6518 |