pennsylvania DEPARTMENT OF ENVIRONMENTAL PROTECTION	**REPORT COMMENTS** C. David Brown 18 Dec 2013	**Commonwealth of Pennsylvania** **Department of Environmental Protection** **Southeast Regional Office** **Environmental Cleanup and Brownfields**

Site: **Philadelphia Refinery AOI 7** 3144 Passyunk Avenue Philadelphia, PA 19145		eFACTS Facility ID: 750870	Tank Facility ID: 51-11554, 51-36558
		Incident ID: *multiple*	NIR Date: 16 Oct 2006
Municipality: Philadelphia	County: Philadelphia		Location: 39.9072°N, 75.2086°W

Comments for Sunoco on AOI 7 "Site Characterization/Remedial Investigation Report" dated 29 Feb 2012 and "Addendum to the Site Characterization/Remedial Investigation Report" dated 19 Sep 2013, prepared by Langan Engineering and Environmental Services, for the former Sunoco Philadelphia Refinery, currently the Philadelphia Energy Solutions Refining and Marketing LLC facility.

General

1. This report was submitted only as an Act 2 remedial investigation report (RIR). However, it includes a risk assessment (§5.0 and Appendix F of the Addendum). A risk assessment report (RAR) is required when performing a baseline risk assessment and for developing site-specific standards (Sections 250.405, 409, and 601). Submission of a RAR must be noted on the transmittal sheet, include payment of the $250 review fee, and include municipal and public notifications.
2. DEP has not formally reviewed the risk assessment portion of the report pending completion of RAR administrative requirements. Some comments are provided below.

Soil Investigation

3. The AOI 7 soil sampling data presented in the reports was limited to 2010–2013 (as well as tank investigations in Appendix E of the Addendum). Was there no relevant soil data from before this time?
4. Figure 3 in the May 2010 "Work Plan for Site Characterization, Area of Interest 7" showed many locations where soil samples exceeded standards, primarily in SWMU investigations circa 1992. Sunoco did not tabulate the results. These locations were not resampled in later investigations, although there were subsequent soil borings in the vicinity of some of the early points. Without more recent data Sunoco should assume that those exceedences still exist.

5. Our records include at least one report of a historic incident in AOI 7 that was not addressed in the RIR. Was there remediation and/or soil sampling at that area? What were the results?

Date	Location	Material	Description
10/29/1993	M Avenue and FCCU-1232 unit	crude oil	~20 BBl released from line
3/2/2007	North of FCCU-1232 unit	slop oil	sewer backup, overflow

6. Are there records of other recent surface or subsurface releases (say, since 1993) that were, or should have been, investigated?

7. Little or no soil data was presented in this report for the locations of many removed tanks, such as Tanks 274, 279, 287, 288, 1102, 1103, 1123, 1132, 1135, 1202, and the former tank field southwest of M Avenue and 3rd Street. Were there closure assessments for these tanks? If not, why hasn't soil been investigated in those areas?

8. No soil data was presented in areas with LNAPL, such as the occurrence near the No. 3 Separator. There were presumably surface or shallow releases that were the source of product at these locations, and there may be remaining soil impacts. Sunoco should investigate soil in these areas.

9. The report indicates that soil borings were limited to unpaved areas. Were there potential sources and contamination at paved areas that should have been investigated?

10. There are several isolated soil borings where samples indicated exceedences but there was no further delineation. Examples include BH-12-48 (SWMU-87), C-142 (SWMU-89), BH-12-87 (SWMU-90), and BH-12-94 (SWMU-91). At these points lead exceeded DEP's direct contact standard (1000 mg/kg) but was below Sunoco's proposed site-specific standard (1700 mg/kg). Is Sunoco confident that soil surrounding these locations does not exceed the site-specific standard?

Groundwater

11. Sunoco provided only one round of groundwater gauging and sampling data in the RIR/SCR. Act 2 and corrective action regulations require at least two rounds of data for a complete site characterization.

LNAPL

12. The extent of LNAPL around wells C-106 and C-168 is not sufficiently delineated.

Vapor Intrusion

13. Are all employees in the Maintenance Building 440 subject to OSHA regulations? Is PES in compliance with 29 CFR Section 1910.1028 for all employees in these buildings?

14. Did Stantec survey the building for possible indoor contaminant sources?

15. How was the building ventilated before and during the sampling? Was it being heated?

16. Why were indoor air samples collected only on the second floor? If vapor intrusion is occurring, it will have the greatest effect in the basement or first floor.

17. The samples were collected for 4 hr. DEP and EPA recommend 8-hr indoor air samples in nonresidential buildings.

18. Stantec obtained trip blanks. There is little QA/QC value to a trip blank in a Summa canister. A field blank would be more useful.

19. Why wasn't naphthalene analyzed in the indoor air samples? Naphthalene is on Sunoco's contaminant list, it is listed by EPA and DEP as a substance of potential VI concern, and it has an OSHA PEL. Naphthalene can be analyzed using Method TO-15.

20. Stantec's description of risk-based screening in §6.2 of the Mar 2013 report (Appendix C of the Addendum) is not correct. DEP's indoor air criteria in our 2004 guidance are derived for the Statewide health standard only (a cancer risk of 10^{-5} and a hazard quotient of 1.0 for each substance). The site-specific standard has been selected for the refinery. The SHS screening criteria are not applicable for the SSS. A SSS pathway evaluation and human health risk assessment is required. Refer to DEP's online Q&A. We do allow SSS screening for indoor air sampling data based on properly adjusted EPA RSLs as described in the Q&A and the Technical Guidance Manual (Section IV.G.2.a.i., p. IV-116). These correspond to a cancer risk of 10^{-6} and a HQ of 0.1 for each substance. On this basis benzene would exceed the SSS screening and might require a risk assessment.

21. Most buildings in AOI 7 are evidently under positive pressure, mitigating possible vapor intrusion. Because there was no vapor intrusion evaluation for these buildings, reliance on pressurization is an engineering control. The post-remediation care plan and environmental covenant will need to have conditions for operating and maintaining such systems.

Storage Tanks

22. Sunoco only described investigations of five tanks in Appendix E of the Addendum. Twelve tanks have open incidents that were not addressed in the RIR/SCR. Corrective actions, including site characterizations, are required for these tanks. They are:

Sunoco Tank	DEP Tank	Incident Date	Incident ID	Facility ID	Material
Unknown UST	*002?*	8/5/1989	5825	51-11554	*gasoline?*
Unknown UST	*003?*	8/5/1989	5915	51-11554	*diesel?*
M-5	005	1/31/1991	45686	51-11554	diesel
275	057A	9/16/1991	45689	51-11554	cat charge stock
272	054A	11/11/1993	45694	51-11554	crude oil
273	035A	6/6/1995	45697	51-36558	vacuum gas oil
M-4	001	5/6/1998	6134	51-36558	gasoline
M-5	002	5/6/1998	45699	51-36558	diesel
1108	149A	9/6/1998	45700	51-36558	No. 6 fuel oil
281	043A	9/18/1999	30777	51-36558	gas oil
281	043A	11/24/2001	5913	51-36558	gas oil
1002	139A	5/2/2006	36456	51-36558	*decanted oil*
1100	140A	5/30/2006	36578	51-36558	*slop oil*
277	039A	6/25/2007	38132	51-36558	heavy gas oil
272	034A	3/8/2011	42279	51-36558	crude oil

Note that some of the above tanks (002, 003, M-4, M-5) were USTs.

23. We request that you *do not* include documentation (such as past reports) in the RIRs for tanks that were either closed with no confirmed contamination or that completed corrective action such that the incident was already closed in our records. (For example, Tanks 283, LO-1000.)

24. Appendix E of the Addendum recommends that DEP administratively close out the cases for five tanks. One of these, Tank 271, will require further action.

Sunoco ID	DEP ID	Incident	Explanation
GP 270	032A	40386	DEP reexamined the Nov 2009 SCR and issued an approval letter on 6 Nov 2013. The incident is closed and no further action is required.
GP 271	033A	29142	The information in the report did not demonstrate attainment of an Act 2 standard. The incident will remain open until that is accomplished.
GP 275	057A	45689	The tank was closed in place, but a 1991 incident was not satisfactorily addressed. (See below.)
GP 283	045A	n/a	This tank underwent a change in service and no release was confirmed. There is no incident to close in our records.
LO-1000		n/a	This tank was closed in place and no release was confirmed. There is no incident to close in our records.

25. An overfill incident was reported for Tank 275 in Sep 1991. The notification indicated that contaminated soil was removed. It is unclear whether any of the May 2007 closure samples were collected in the impacted area. (For example, were those locations chosen beneath all tank vents?) Documentation of soil disposal should be provided.

26. Sunoco should consider whether further groundwater investigation is needed at any of the tanks with releases. For instance, there were documented groundwater impacts at USTs M-4 and M-5, but there are no monitoring wells in the area of those tanks.

Fate & Transport Modeling

DEP provided remarks on fate-and-transport analyses in the 12 Sep 2013 comments for AOI 11 and the 22 Nov 2013 comments for AOI 6. Many of those apply to the modeling described in the AOI 7 report as well. Some additional comments on the analyses in Appendix G in the 2012 RIR follow.

27. The LNAPL near the No. 3 Separator was treated as a source area and was modeled for impacts to the river. Explain why chrysene was the only contaminant of concern that was evaluated for dissolution into groundwater. The LNAPL was classified as "light crude oil." Source concentrations should be defined as the effective solubilities of the substances that make up the LNAPL.

28. LNAPL at wells C-106 and C-168 was not evaluated for river impacts.

29. The modeling used a hydraulic conductivity of 4.6 ft/day. Document and explain the source of that value.

30. It makes no sense to assign a longitudinal dispersivity of 200′ in models where the distance between the source area and the receptor (the river) is much less than that (e.g., No. 3 Separator, well C-142).

31. A 1 Apr 2011 DEP memo, provided to Sunoco and Langan on 28 Apr 2011, explained that there should be a determination of the cumulative contaminant loading by diffuse groundwater flow into the Schuylkill River, and not just modeling for individual sources. We recommend that all sources in each AOI be evaluated cumulatively; after approval of all RIRs Sunoco should submit a report that evaluates the cumulative river loading from all refinery sources.

32. The report refers to a 300 μg/L chrysene surface water criterion. I was unable to find this standard in Title 25 Pa. Code Ch. 93. As noted in the 12 Sep 2013 AOI 11 comments, the tidal portion of the Schuylkill River is exempt from Ch. 93 potable water supply standards. Therefore, the 0.0038 μg/L chrysene human health standard is not applicable.

Exposure Pathways

33. The reports suggest that worker direct contact exposures will be prevented by means of existing refinery procedures. Please provide copies of procedures relevant to worker health and safety when excavating contaminated soil or handling subsurface LNAPL. Explain how these procedures will eliminate all direct contact exposure routes.

34. The 2012 RIR describes an ecological assessment. Provide documentation of the PNDI search. Also document Pennsylvania Game and Fish & Boat Commission decisions concluding no effects on threatened/endangered species.

Risk Assessment

35. All formulas used and all input parameter values must be provided for the risk calculations. Explain what the exposure route is—ingestion or inhalation (by volatiles or particulates).

36. The revised target and baseline blood lead levels appear to be appropriate. Based on these studies, we expect that the geometric standard deviation of blood lead distribution should also change. This value should be determined and input into the calculation.

12/18/13

C. David Brown P.G. | Date

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