Fourth Five-Year Review Report
for
Petroleum Products Corporation
FLD980798698

Pembroke Park
Broward County, Florida

December 2015

United States Environmental Protection Agency
Region 4
Atlanta, Georgia

Approved by:

Franklin E. Hill, Director
Superfund Division

Date: 12/3/15

Fourth Five-Year Review Report
for
Petroleum Products Corporation
3130 SW 19th Street
Pembroke Park
Broward County, Florida

Tables

Figures

List of Acronyms

AOC	Administrative Order on Consent
ARAR	Applicable or Relevant and Appropriate Requirement
BDL	Below Detection Limit
BRA	Baseline Risk Assessment
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
COC	Contaminants of Concern
EPA	United States Environmental Protection Agency
ESD	Explanation of Significant Differences
FDEP	Florida Department of Environmental Protection
FYR	Five-Year Review
HHRA	Human Health Risk Assessment
IAROD	Interim Action Record of Decision
IC	Institutional Control
LNAPL	Light Non-Aqueous Phase Liquid
MCL	Maximum Contaminant Level
mg/L	Milligrams per Liter
µg/m3	Micrograms per Cubic Meter
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
O&M	Operation and Maintenance
OU	Operable Unit
PPC	Petroleum Products Corporation
PRP	Potentially Responsible Party
RA	Remedial Action
RAO	Remedial Action Objective
RD	Remedial Design
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RPM	Remedial Project Manager
TBC	To-Be-Considered
USACE	U.S. Army Corps of Engineers
VISL	Vapor Intrusion Screening Levels
VOC	Volatile organic compound

Executive Summary

The 2-acre Petroleum Products Corporation Superfund site (the Site) is located in Pembroke Park, Broward County Florida. From 1957 to 1971, the Petroleum Products Corporation (PPC) operated an oil re-refining facility on the site property. Currently, the Pembroke Park Warehouses occupy the property. The warehouses include storage units, commercial businesses, and light industrial businesses. A residential area (Bamboo Park Mobile Homes) is next to the Site to the south. Commercial and industrial businesses occupy buildings to the west, north, and east.

PPC operators used sulfuric acid clay in the re-refining process. They disposed of waste oil and sulfuric acid waste in unlined open pits. On-site waste disposal resulted in contamination of soil and groundwater with solvents, sulfuric acid, and heavy metals. During operations, residents south of the Site would observe oil slicks and informed local and state agencies. After investigating site contamination, the United States Environmental Protection Agency issued an Administrative Order on Consent (AOC) to PPC in 1985 to conduct a cleanup. The EPA added the Site to the Superfund program's National Priorities List (NPL) on July 22, 1987. The EPA addresses the Site as three operable units (OUs). OU1 addresses product recovery and containment of the groundwater plume, OU2 addresses soil contamination and OU3 addresses groundwater contamination.

PPC conducted initial cleanup actions and installed a free-product recovery system, which operated from 1985 to 1991. The EPA issued an Interim Action Record of Decision (IAROD) for OU1 in 1990, later modified by a 1991 Explanation of Significant Differences (ESD). A second treatment system using air stripping and activated carbon operated with limited success between 1994 and 1998. In 1998, the potentially responsible party (PRP) Group, made up of more than twenty generators, began a third free-product recovery method using a vacuum-enhanced bioslurper unit. The EPA documented the recovery method change in a 1998 ESD. The bioslurper unit operated until September 2012, when the Florida Department of Environmental Protection (FDEP) changed the remedy to quarterly monitoring and free-product collection on an as-needed basis. The EPA is preparing a ROD for OU2. An OU3 ROD will be prepared after the OU2 remedy is implemented. The triggering action for this five-year review (FYR) was the signing of the previous FYR on December 14, 2010.

The remedy for OU1 (Product Recovery), is currently protective of human health and the environment in the short term. The site is within a delineated area, a form of Institutional Control, which requires the State's District office approval for well placement. Site wells are being monitored by the PRP's contractor and oil/sludge is collected if detected in perimeter wells. In order for the remedy to be protective in the long term, a final remedy will need to be selected. Currently, a final remedy selection is scheduled for OU1 and OU2 in FY 2016.

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site Name: Petroleum Products Corporation		
EPA ID: FLD980798698		
Region: 4	**State:** FL	**City/County:** Pembroke Park/Broward County
SITE STATUS		
NPL Status: Final		
Multiple OUs? Yes	**Has the site achieved construction completion?** No	
REVIEW STATUS		
Lead agency: EPA		
Author name: Johnny Zimmerman-Ward (Reviewed by the EPA)		
Author affiliation: Skeo Solutions		
Review period: March 2015 – November 2015		
Date of site inspection: March 31, 2015		
Type of review: Statutory		
Review number: 4		
Triggering action date: December 14, 2010		
Due date *(five years after triggering action date)*: December 14, 2015		

Five-Year Review Summary Form (continued)

Issues/Recommendations

OU(s) without Issues/Recommendations Identified in the Five-Year Review:
None

Issues and Recommendations Identified in the Five-Year Review:				
OU(s): OU1	Issue Category: Remedy Performance			
	Issue: The OU1 remedy of product recovery no longer uses a bioslurping unit. The product recovery is through scheduled bi-weekly well inspections, product pumping, baling and off-site disposal until a final remedy is selected for OU1 (product recovery) and OU2 (soil).			
	Recommendation: Finalize the sitewide remedy.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Implementing Party**	**Oversight Party**	**Milestone Date**
No	Yes	EPA/State/PRP	EPA	12/14/2017

Protectiveness Statement

Operable Unit:	*Protectiveness Determination:*	*Addendum Due Date*
OU1	Short-term Protective	

Protectiveness Statement:
The remedy for OU1 is currently protective of human health and the environment in the short term. An Institutional Control, through a delineated area, is in place that prevents well placement without District office approval. Site wells are being monitored bi-weekly with removal of product in perimeter wells. The Site has scheduled inspections by a PRP and State contractor. In order for the remedy to be protective in the long term, a final remedy will need to be selected. A final remedy for OU1 (product recovery) and OU2 (soil) is scheduled for FY 2016.

Environmental Indicators

- *Current human exposures at this site are under control.*
- *Contaminated groundwater migration is not under control.*

Are Necessary Institutional Controls in Place?

☐ All ☒ Some ☐ None
The Site needs further evaluation to determine if additional groundwater and land use restrictions are needed.

Has EPA Designated the Site as Sitewide Ready for Anticipated Use?
☐ Yes ☒ No

Has the Site Been Put into Reuse?
☒ Yes ☐ No

Fourth Five-Year Review Report
for
Petroleum Products Corporation Superfund Site

1.0 Introduction

The purpose of a Five Year Review (FYR) is to evaluate the implementation and performance of a remedy in order to determine if the remedy will continue to be protective of human health and the environment. FYR reports document FYR methods, findings, and conclusions. In addition, FYR reports identify issues found during the review, if any, and document recommendations to address them.

The EPA prepares FYRs pursuant to the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Section 121 and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). CERCLA Section 121 states:

> If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each 5 years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.

The EPA interpreted this requirement further in the NCP, 40 Code of Federal Regulations (CFR) Section 300.430(f)(4)(ii), which states:

> If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after initiation of the selected remedial action.

Skeo Solutions, an EPA Region 4 contractor, conducted the FYR and prepared this report regarding the remedy implemented at the Petroleum Products Corporation Superfund site (the Site) in Pembroke Park, Broward County, Florida. The EPA's contractor conducted this FYR from March to November 2015. The EPA is the lead agency for developing and implementing the remedy for the PRP financed cleanup at the Site. The FDEP, as the support agency representing the State of Florida, has reviewed all supporting documentation and provided input to the EPA during the FYR process.

This is the fourth FYR for the Site. The triggering action for this statutory review is the previous FYR. The FYR is required because hazardous substances, pollutants, or contaminants remain at the Site above levels that allow for unlimited use and unrestricted exposure. The Site consists of three operable units (OUs). This FYR report addresses OU1 (product recovery).

2.0 Site Chronology

Table 1 lists the dates of important events for the Site.

Table 1: Chronology of Site Events

Event	Date
Petroleum Products Corporation (PPC) started operating as a re-refiner of waste oil at the Site	1957
PPC initiated major changes in its operation after a large rainfall caused the disposal pit to overflow, producing an oil slick on the lakes of a nearby mobile home community	1970
PPC ended operations and began operating as a storage and distribution facility. PPC constructed warehouses on the northern and western sections of the property	1971
PPC cleaned up portions of the Site in response to two warning notices from Broward County Environmental Quality Control Board	May-June 1979
Florida Department of Environmental Regulation, now FDEP, issued a Notice of Violations requesting PPC remove additional waste oils from the Site and submit a detailed sampling analysis plan	June 1983
The EPA issued an Administrative Order on Consent (AOC) to PPC to conduct a removal action	April 1, 1985
The EPA proposed the Site to the National Priorities List (NPL)	April 10, 1985
The PRP completed the removal action	October 10, 1985
The State initiated OU1 combined remedial investigation/feasibility study (RI/FS)	April 1, 1986
The EPA listed the Site on the NPL	July 22, 1987
The EPA initiated the OU1 RI/FS and the PRP completed the OU1 RI/FS	September 15, 1989
FDEP approved PPC to participate in the State's petroleum cleanup program	August 1990
The EPA completed the OU1 RI/FS and signed the OU1 interim action Record of Decision (ROD)	October 5, 1990
The free-product recovery system installed in 1985 stopped operating	1991
The EPA issued an Explanation of Significant Differences (ESD) deferring closeout of the surface drainage system until a final remedy decision was made for the Site	March 11, 1991
PRP initiated a remedial design (RD) for the recovery system	October 1, 1991
The EPA issued a Consent Decree	December 11, 1991
The EPA prepared a Baseline Risk Assessment (BRA)	June 1992
PRP completed RD and initiated remedial action (RA)	June 10, 1993
PRP initiated operation of a second treatment system using air stripping and activated carbon	1994
PRP initiated a RD for second recovery system	December 30, 1997
Operation of the second treatment system using air stripping and activated carbon ended	1998
The EPA issued a second ESD to document differences in recovery technologies and the change to a bioslurper system	August 3, 1998
Operation of bioslurper unit initiated	May 26, 1999
PRP completed RA and began Long-Term Response Action	July 13, 1999
AOC filed	September 14, 1999
Bioslurper unit temporarily shut down due to discovery of free product in injection well	November 1999
The EPA signed the first FYR	September 19, 2000
AOC filed	April 24, 2001
Soil Assessment Report for Bamboo Park Mobile Homes issued	November 2002
Twenty-four monitoring wells abandoned	March 2004
The EPA signed the second FYR	December 20, 2005
Potable well survey performed	May 2006
Remedial Alternative Evaluation Report prepared	December 22, 2008
The EPA and the U.S. Army Corps of Engineers (USACE) signed an Interagency Agreement to address an RI/FS for OU2	2009
Light Non-Aqueous Phase Liquid (LNAPL) removed from Warehouse Bay 261	March 18-19, 2009

Event	Date
Site Assessment Report issued for potential contamination on western property	December 15, 2009
The EPA signed the third FYR	December 14, 2010
PRP group conducted a soil removal action at Bamboo Park Mobile Homes and EPA contractors conducted an air study	February 2011
The EPA issued the final air study report	April 28, 2011
Operation of bioslurper unit ended and interim remedy switched over to monitoring and as-needed removals	September 2012
Pembroke Business Park, LLC entered into a 40-year master lease agreement with Pembroke Park Warehouses	October 2, 2014

3.0 Background

3.1 Physical Characteristics

The 2-acre Site is located at 3130 SW. 19th Street in an industrial and commercial area of Pembroke Park, Broward County, Florida. Pembroke Road borders the Site to the north, South Park Road to the west, Carolina Street to the south and SW. 31st Avenue to the east (Figure 1). The Bamboo Park Mobile Homes (Figure 3) are south of the Site across Carolina Street. Interstate 95 is about 0.2 miles east of the Site.

The Site is in a flat, low-lying coastal area with shallow depressions. Elevation ranges from 5-8 feet above sea level. Very little undisturbed topography remains because pavement or warehouse buildings cover most of the Site. Fill materials were imported to build up the area for development, and the warehouses are 4 feet higher than surrounding areas south and west of the Site. The Site lies above the Biscayne aquifer, a federally designated sole-source aquifer in southern Florida.

3.2 Land and Resource Use

Between 1958 and 1971, PPC operated an oil-refining facility on site. Currently, the Pembroke Park Warehouses occupy the property. The warehouses house storage units; commercial businesses, including a gun range; and light industrial businesses including a construction company. The Site is zoned for commercial/industrial use, and current zoning prohibits schools and residential uses of the property. The surrounding area is highly developed with commercial/industrial activities and residential areas. A high-density neighborhood of mobile homes is next to the Site, south of Carolina Street. Land use is anticipated to remain the same in the future.

The Site lies within the radius of influence of two major well fields for the cities of Hallandale (about 0.5 mile east) and Hollywood (about 1.5 miles northwest). Residences and businesses on site and near the Site receive drinking water from the public water supply. The Site is within the South Florida Water Management District. All groundwater well usage requires prior approval from the District.

3.3 History of Contamination

From 1958 to 1971, PPC operated an oil-refining facility on the southern half of the Site. PPC refined used oil using sulfuric acid clay. This process created waste sulfuric acid and spent clay contaminated with chlorinated solvents, metals, and other contaminants. The facility included a tank farm with 22 aboveground storage tanks and two unlined disposal pits. During operations, PPC disposed of about 150,000 gallons of contaminated and used oil in the unlined pits. The sludge pits are from 2.6-21 feet

below ground surface. The pits contain a heterogeneous mixture of black and oily materials with a strong petroleum odor (Figure 2).

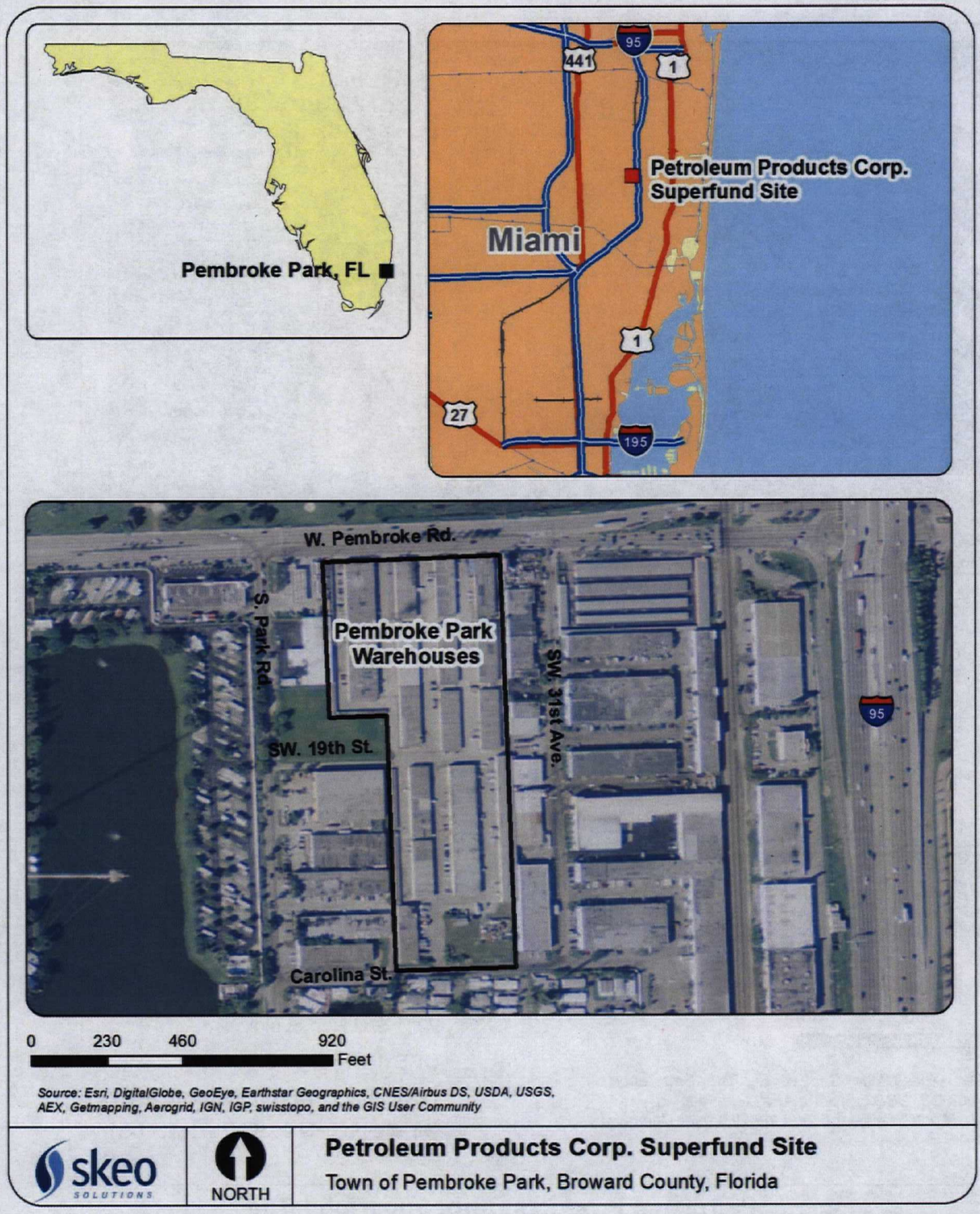
During operations, residents of the Bamboo Park Mobile Homes complained to PPC and local authorities about oil overflows from PPC disposal pits. A major rainfall in 1970 resulted in saturation of the ground, causing waste oil in the disposal pits to rise and overflow. This created oil slicks on the lake next to the mobile home park. In 1971, PPC prepared the site property for sale and filled disposal pits with a mixture of sludge and clean fill. The owner and operator of PPC sold the Site to a private property owner who still owns most of the property. In 1972, the new owner built warehouses over the former pits on the northern and western sections of the site property. PPC continued limited operations on the southeast corner of the Site until 1985, when PPC ended operations. The site property owner then built additional warehouse buildings in this area.

3.4 Initial Response

The Broward County Environmental Quality Control Board issued two warning notices to PPC in May 1979. Later that year, PPC began cleaning up some of the Site. In June 1983, Florida Department of Environmental Regulation, now the FDEP, issued a Notice of Violations requesting that PPC remove additional waste oils and submit a detailed sampling and analysis plan. PPC hired an environmental consulting firm to conduct sampling on their behalf. The sampling found waste oil floating on top of the Biscayne aquifer. Groundwater also contained oil, grease, petroleum hydrocarbons, volatile organic compounds (VOCs) and several inorganic compounds. Subsequent studies by FDEP confirmed that the plume was migrating east-southeast toward Carolina Avenue and the residential area (Figure 2).

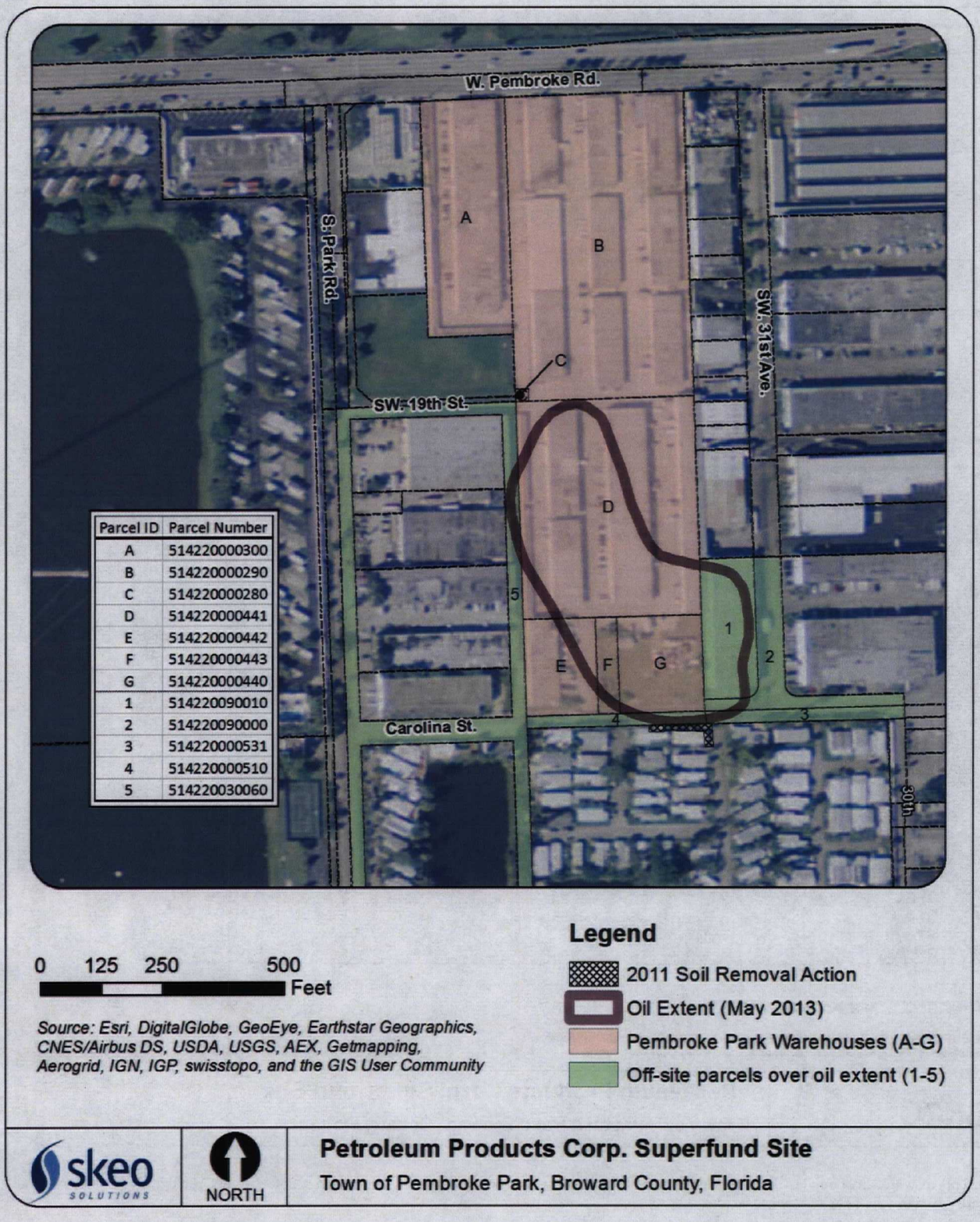
In March 1985, PPC entered into an AOC with the EPA, agreeing to perform cleanup under EPA oversight. Actions outlined in the AOC include: emptying, cleaning and properly disabling/abandoning tanks; testing all oil, water, and sludge prior to disposal; properly disposing of or recycling oil; and removing asbestos from the boiler house. In October 1985, PPC completed these activities and removed 262 waste drums of sludge. As the PRP, PPC also installed a free-product oil recovery system in 1985. This system consisted of a 30-inch diameter, 23-foot deep extraction well that recovered 25 gallons per minute. Between 1985 and 1991, the system removed about 6,900 gallons of waste oil. The EPA first proposed the Site for the Superfund program's NPL in April 1985, and finalized the Site's NPL listing on July 22, 1987.

Figure 1: Site Location Map



Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding the EPA's response actions at the Site.

Figure 2: Site Map



Parcel ID	Parcel Number
A	514220000300
B	514220000290
C	514220000280
D	514220000441
E	514220000442
F	514220000443
G	514220000440
1	514220090010
2	514220090000
3	514220000531
4	514220000510
5	514220030060

Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding the EPA's response actions at the Site.

3.5 Basis for Taking Action

After adding the Site to the NPL, the PRPs, which included PPC and the Pembroke Park Warehouses, completed a two-phase remedial investigation (RI) under EPA oversight between 1986 and 1987.

The 1986-1987 RI found the following:

- Extensive soil contamination was restricted to the southern half of the original PPC property. In the disposal pit areas, there was highly contaminated sludge almost 28 feet below the ground surface.
- Lead, chromium and other inorganic contaminants exceeded Florida groundwater standards in several shallow monitoring wells. The shallow groundwater contaminant plumes coincided with the main area of soil contamination and had not migrated far off site.
- The limited extent of contaminant transport was primarily controlled by relatively flat hydraulic gradient and low groundwater flow.
- Vertical migration of contaminants into the more transmissive zone of the Biscayne aquifer had occurred. However, the extent of lateral migration within this zone was limited by very low hydraulic gradients.
- The degraded condition of on-site drainage culverts provided a direct pathway for contaminants to enter the groundwater system.
- The Site was a stable system that posed no immediate threat to municipal water supplies as long as the contaminants did not spread.

A 1992 Baseline Risk Assessment (BRA) evaluated risk exposure pathways for current land use scenarios involving incidental ingestion of soils by on-site workers and children. The BRA also evaluated dermal adsorption of surface water by on-site workers and children. The BRA found that cancer risks in the exposure scenarios were less than EPA's benchmark. Potential risks would be noncarcinogenic in nature. Seepage of light non-aqueous phase liquid (LNAPL) into buildings and release of volatilized chemicals would likely present an unacceptable exposure and risk. Such seepage had been reported at the Site. For future land use scenarios, the BRA considered ingestion of groundwater, and inhalation or dermal adsorption by adult and child residents. The greatest risks included consumption of lead-, acetone- and vinyl chloride-contaminated groundwater, or soil by residents living south of the Site and future migration of contaminants to the surficial depth for potable water. The BRA found little to no significant ecological risks because the Site is mostly developed and most contamination is under pavement or buildings.

4.0 Remedial Actions

In accordance with CERCLA and the NCP, the overriding goals for any remedial action are protection of human health and the environment and compliance with applicable or relevant and appropriate requirements (ARARs). A number of remedial alternatives were considered for the Site, and final selection was made based on an evaluation of each alternative against nine evaluation criteria that are specified in Section 300.430(e)(9)(iii) of the NCP. The nine criteria are:

1. Overall Protection of Human Health and the Environment
2. Compliance with ARARs
3. Long-Term Effectiveness and Permanence

4. Reduction of Toxicity, Mobility or Volume through Treatment
5. Short-Term Effectiveness
6. Implementability
7. Cost
8. State Acceptance
9. Community Acceptance

4.1 Remedy Selection

The EPA is addressing the site cleanup as three OUs. OU1 addresses free oil product recovery and containment of the groundwater plume, OU2 addresses contaminated soil, and OU3 addresses contaminated groundwater. The EPA has issued an Interim Action ROD for OU1. A ROD for OU2 and OU3 has not been completed. The EPA and the U.S. Army Corps of Engineers (USACE) entered into an inter-agency agreement in 2009 to conduct the RI/FS for OU2. The RI and supplemental human health risk assessment has been completed. A final FS is planned for FY2016 and a ROD for OU1/2 is planned for 2016.

1990 Interim Action ROD

On October 5, 1990, the EPA signed an Interim Action Record of Decision (IAROD) for OU1 to contain contamination sources until further alternatives for source control can be assessed. The selected remedy in the OU1 IAROD included retiring non-operating wells; closing storm drainage wells that discharge to the Biscayne aquifer; conducting a private well survey to identify groundwater users; and modifying the groundwater recovery system to remove more oil and contain future migration of contaminants. The IAROD outlined contaminants of concern (COCs) for the contaminant plume and shallow soil (Table 2). The IAROD did not establish COCs or remedial goals for groundwater and deeper soils, which will be established when the EPA issues RODs for OU2 and OU3.

The 1990 IAROD did not list remedial action objectives (RAOs), but listed the following goals:

- Contain the plume within the boundaries of the Site.
- Prevent further water infiltration into the disposal pit area by preventing infiltration of water into the soils.
- Increase the recovery of waste oil from the groundwater.

Table 2: On-Site and Off-Site COCs for OU1

Site Area	COCs
Biscayne aquifer surficial zone, on site	Aluminum, Chromium, Lead, Manganese
Biscayne aquifer surficial zone, off site	Aluminum, Chromium, Iron, Lead, Manganese Trichloroethylene
Biscayne aquifer intermediate zone, off site	Aluminum Iron
Shallow soil, off site	Arsenic, Lead
Note: Site areas and COCs are from the 1990 interim ROD.	

Modifications to the 1990 IAROD

Since 1990, the EPA has modified the interim OU1 remedy twice. The first modification, documented in the March 11, 1991 ESD, deferred closeout of the surface drainage system until the EPA selected and implemented a remedy for OU2. This was done because excavation of contaminated soil could destroy

the drainage system. A second ESD on August 3, 1998, documented the differences between recovery technologies in the original remedial design and the modified bioslurper system, which was selected to recover free product at the Site in 1999.

4.2 Remedy Implementation

In August 1990, FDEP approved PPC's participation in the state-funded petroleum cleanup program, called the State of Florida's Inland Protection Trust Fund. In December 1991, the EPA and the PRPs entered into a Consent Decree for implementation of cleanup activities outlined in the 1990 IAROD. By 1991, contractors hired by the PRP Group conducted a survey of existing culvert drainage wells at the Site and confirmed that they did not present a direct pathway to the Biscayne aquifer. In response, the EPA issued the 1991 ESD deferring closeout until development of the OU2 remedy. In June of 1993 the Remedial Design was completed for OU1. In 1994 the Remedial Action was initiated. A second treatment system which included air stripping and activated carbon was utilized.

Free-Product Recovery and Treatment by Air Stripping

To address recovery of free product, the PRP Group divided the Site into two zones characterized by location and viscosity; the southern side (Zone 1) contains low-viscosity oil and the northern side (Zone 2) contains high-viscosity oil. The original approach to capturing free product in Zone 1 involved a groundwater pump-and-treat system to lower the groundwater table. The depression would encourage flow of free product above the groundwater table toward extraction points. A system with two air stripping towers and activated carbon treated extracted groundwater. Due to buildup of hydrogen sulfide, hydrogen peroxide was added to the treatment system. Treated groundwater was then discharged to an injection well. This treatment system operated from 1994 to December 1998, and recovered about 3,500 gallons of free product. Because the system operated below the rate recommended in the remedial design, the PRP Group decided to try another recovery technology.

Bioslurper Recovery System and Treatment

In 1998, the EPA issued the second ESD documenting the change from extraction and treatment to a bioslurper system, which began operating in May 1999. The bioslurper recovery system extracted groundwater, free product, and soil gas. At the extraction point, the three substances were separated and treated above ground. The bioslurper used a vacuum enhanced recovery system by creating a pressure gradient to move waste oil into the recovery well. Treated groundwater and soil gas were discharged back into the aquifer and atmosphere, respectively. The PRP Group constructed the bioslurper system on the southern end of the Site at Zone 1. The lessons learned during Phase I operation at Zone 1 were applied to Phase II, which expanded the extraction system to the northern area of the Site.

The bioslurper system temporarily shut down in April 2000, due to free-product emulsification blocking the activated carbon system. The treatment process then switched over to chemical treatment with ferric sulfate to avoid blockage. However, chemical treatment resulted in higher concentrations of iron and sulfate. FDEP issued an Underground Injection Control permit allowing for variance in the discharge concentration to 5 milligrams per liter (mg/L) of iron and 500 mg/L of sulfate. The PRP Group began Phase II operation of the bioslurper system for Zone 2 in August 2001. To date, the bioslurper system has recovered about 40,000 gallons of oil and free product.

Between 2008 and 2009, FDEP asked the PRP Group to evaluate various methods to further enhance and optimize recovery of free product. This included a December 2008 Remedial Alternative Evaluation of thermal treatment technologies to lower oil viscosity and enhance extractability. In June 2009, FDEP

tasked the PRP Group to conduct an Oil Viscosity Study to assess the feasibility of using thermal conductive heating. The study concluded that thermal conductive heating would lower the viscosity and improve recovery rates, but the optimal temperature may damage PVC piping in the recovery well system. A high cost of implementation and lack of available funding has impeded implementation of thermal-enhanced treatment technologies at the Site. In September 2012, the PRP Group ended operation of the bioslurper unit. After deactivation of the bioslurper system, the PRP Group shifted to quarterly groundwater and free-product monitoring to evaluate site conditions.

Emergency Removal

In March 2009, FDEP tasked the PRP Group to clean up Warehouse Bay 261 in the Pembroke Park Warehouses. Free product had seeped through the foundation and accumulated in a pit on the floor, posing a threat of exposure to free product. On March 18 and 19, 2009, the PRP contractor removed 400 gallons of LNAPL. The relatively large amount of free product recovered prompted FDEP to believe that future recovery of free product could occur directly from Warehouse Bay 261. There was some LNAPL in Warehouse Bay 261 during the FYR site inspection in 2010.

Surrounding Areas of Contamination

In March 2010, FDEP tasked a contractor to investigate and potentially conduct a source removal action on a residential property just south of the Site in the Bamboo Park Mobile Homes (2301 SW 31st Avenue). In February 2011, the PRP group excavated an estimated 330 cubic yards of shallow contaminated petroleum-impacted soils around the residential property.

4.3 Operation and Maintenance (O&M)

Under the State's petroleum cleanup program, the State reimburses PPC for costs associated with removal, the RI/FS, remedial design/remedial action and long-term O&M of the waste oil recovery system.

The EPA outlined an O&M plan in the 1998 Final Remedial Action Plan and the 1999 Operations, Monitoring and Maintenance Manual. The main objective of O&M is to recover free product and minimize lateral migration of LNAPL. FDEP hired Environmental Consulting and Technology, Inc. (ECT) to create and submit monitoring and system performance reports. Quarterly and annual monitoring reports document the following: total operational hours, pressure of the liquid pump ring, volume of processed water and collected free product, flow and concentration of vapor gas, and measurements before and after rotating extraction wells. ECT submits reports each quarter in addition to annual groundwater monitoring reports from wells on and off site. Measured parameters during annual groundwater sampling include benzene, toluene, ethyl benzene, xylenes and methyl tertiary butyl ether (EPA Method 8021B), polynuclear aromatic hydrocarbons (EPA Method 8270) and Florida Petroleum Range Organics.

Operation of the bioslurper system continued until September 2012. Since 2012, ECT has continued monitoring, since the last FYR in 2010, petroleum LNAPL levels, groundwater levels, and performing groundwater sampling for on-site wells. A rough estimate of the costs to operate the remedial system, including contractor oversight and associated analytical sampling, was about $150,000 per quarter from January 2010 to September 2012. Cost estimates since 2012 have not been available.

Table 3: Annual O&M Costs

Date Range	Total Estimated Cost
January-December 2010	$600,000
January-December 2011	$600,000
January-September 2012	$450,000
Total	**$1,650,000**

5.0 Progress Since the Last Five-Year Review

The 2010 FYR included four issues and recommendations. This report summarizes each recommendation and its current status below.

Table 4: Progress on Recommendations from the 2010 FYR

Recommendations	Party Responsible	Milestone Date	Action Taken and Outcome	Date of Action
Determine if site contamination is affecting the Hallandale public water supply wells that are located within a half mile of the Site and evaluate the Site to determine if interim institutional controls are necessary to limit use of groundwater.	PRP	10/1/2011	The EPA, FDEP, and PRP continue studying the contaminant plume in relation to the influence of well fields for the cities of Hallandale and Hollywood. Plume migration may be related to the well fields, but remedial investigations continue.	Ongoing
Determine if the Site and neighboring properties require interim land use controls until a ROD has been created for OU2.	EPA/FDEP/ PRP	10/1/2014	The EPA/FDEP addressing OU1 and OU2. RI/FS is in process to determine if neighboring properties are affected and if institutional controls beyond the existing Florida Delineated Groundwater Area restrictions on groundwater use are needed.	Considered and Not Implemented
Assess options to improve the effectiveness of the bioslurper system, and based on those results, set goals that can be used to assess the system performance.	PRP	10/1/2011	FDEP ended operation of the bioslurper unit due to limited recovery and high operational costs. The EPA and FDEP are continuing to assess recovery and treatment options as development of the OU1/2 and OU3 RODs continues.	Ongoing
Determine if a vapor intrusion study is necessary and appropriate.	EPA	10/1/2011	The EPA conducted a 2011 field-sampling event for a vapor intrusion assessment and evaluation. The April 28, 2011 Air Study Report did not reveal an impact from vapor intrusion. A more in depth evaluation of the data may be considered for future action.	4/28/2011

6.0 Five-Year Review Process

6.1 Administrative Components

EPA Region 4 initiated the FYR in March 2015 and scheduled its completion for December 2015. The EPA remedial project manager (RPM) Michael Taylor led the EPA site review team, which also included Brad Jackson (USACE), Kelsey Helton, and Jeff Ray (FDEP), and contractor support provided to the EPA by Skeo Solutions. In March 2015, the EPA held a scoping call with the review team to discuss the Site and items of interest as they related to the protectiveness of the remedy currently in place. The review schedule established consisted of the following activities:

- Community notification.
- Document review.
- Data collection and review.
- Site inspection.
- Local interviews.
- FYR Report development and review.

6.2 Community Involvement

In March 2015, the EPA published a public notice in the Sun Sentinel newspaper announcing the commencement of the FYR process for the Site, providing contact information for EPA, and inviting community participation. The press notice is available in Appendix B. EPA has not been contacted by the public as a result of the advertisement.

The EPA will make the final FYR Report available to the public. Upon completion of the FYR, the EPA will place copies of the document in the designated site repository: Broward County Public Library, located at 100 S. Andrews Avenue, Fort Lauderdale, Florida 33301.

6.3 Document Review

This FYR included a review of relevant site-related documents, including the IAROD, remedial action reports, and recent monitoring data. Appendix A provides a complete list of the documents reviewed.

ARARs Review

CERCLA Section 121(d)(1) requires that Superfund remedial actions attain "a degree of cleanup of hazardous substances, pollutants, and contaminants released into the environment and of control of further release at a minimum which assures protection of human health and the environment." The remedial action must achieve a level of cleanup that at least attains those requirements that are legally applicable or relevant and appropriate under federal or state laws.

- Applicable requirements are those cleanup standards, standards of control, and other substantive requirements, criteria or limitations promulgated under federal environmental or state environmental laws that specifically address a hazardous substance, remedial action, location or other circumstance found at a CERCLA site.

- Relevant and appropriate requirements are those standards that, while not "applicable," address problems or situations sufficiently similar to those encountered at the CERCLA site that their use is well suited to the particular site. Only those state standards that are more stringent than federal requirements may be applicable or relevant and appropriate.
- To-Be-Considered (TBC) criteria are non-promulgated advisories and guidance that are not legally binding, but should be considered in determining the necessary remedial action. For example, TBC criteria are particularly useful in determining health-based levels where no ARARs exist or in developing the appropriate method for conducting a remedial action.

Remedial actions are required to comply with the action-, chemical- and location-specific ARARs identified in the ROD. The 1990 IAROD aimed to contain the contaminated plume within the boundaries of the Site and did not establish chemical-specific ARARs for soil and groundwater COCs. The EPA will reference maximum contaminant levels (MCLs), as well as Florida's GCTLs and SCTLs as ARARs when a final remedy is selected for OU2 (soil) and OU3 (groundwater). The interim ROD did establish groundwater and soil COCs, which included aluminum, chromium, lead, and manganese for on-site groundwater; aluminum, chromium, iron, lead, manganese and trichloroethylene for off-site groundwater; and arsenic and lead for off-site soils (Table 2). As part of the ongoing RI/FS and development of the OU2 and OU3 RODs, the EPA will review and select ARARs for site COCs. In the interim, until a final remedy is selected, groundwater use is prohibited within the Florida Groundwater Delineated Area on and around the Site.

Institutional Control Review

On March 10, 2015, EPA contractor staff conducted research using Broward County's online Official Records Search at: https://officialrecords.broward.org/oncoreV2/Search.aspx. Contractor staff found the deed information pertaining to the Pembroke Park Warehouses listed in Table 5.

Table 5: Deed Documents from Broward County Official Records Search

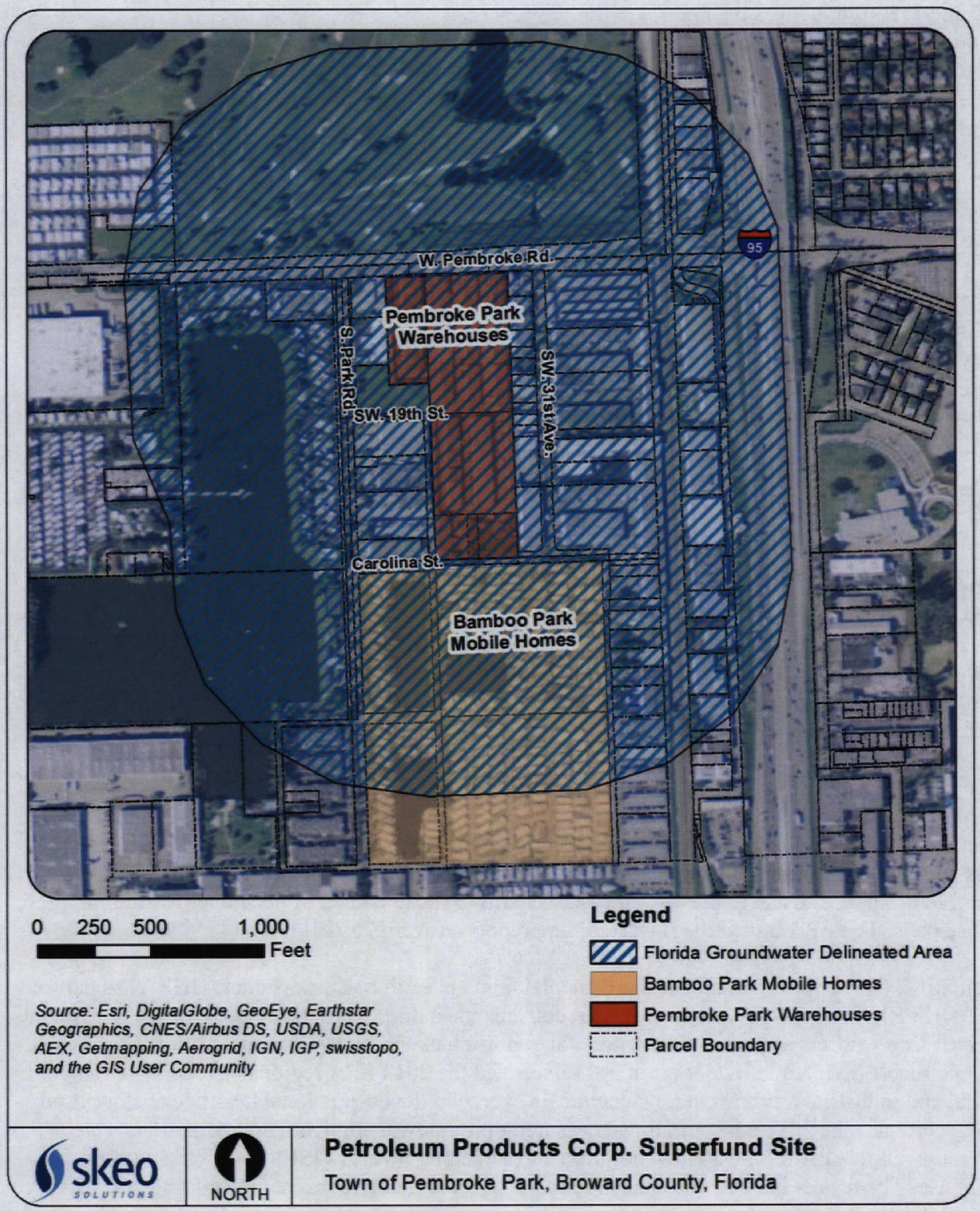
Date	Type of Document	Description	Book #	Page #
1/9/2004	Property Deed	Document transferring property from Pembroke Park Warehouses, LLC to Five Y Investments, Inc. The document specifies that zoning and/or restrictions imposed by governmental authorities on conditions, easements, restrictions, and covenants are subject to the conveyance.	36762	1538
10/1/2012	Property Deed	Re-recorded version of 2004 property deed to correct scrivener's error of legal description.	49121	1308
10/2/2014	Memorandum of Lease	Document recording the memorandum of a master lease between Pembroke Park Warehouses Holding Company and Pembroke Business Park, LLC commencing on August 1, 2014, and expiring on July 31, 2044.	51140	790

Table 6: Institutional Control (IC) Summary Table

Media[1]	ICs Needed	ICs Called for in the Decision Documents	Impacted Parcels[2]	IC Objective	Instrument in Place
Groundwater	Yes	No	514220090010, 514220000510, 514220030060, 514220000440, 514220000441, 514220000442 and 514220000443	Restrict installation of groundwater wells	The Site lies within a Florida Groundwater Delineated Area, which restricts well placement.[3]

1. The EPA has not yet issued RODs for OU2 or OU3.
2. Additional parcels may also be impacted by the Site.
3. Florida's groundwater delineation information is available online at: http://www.dep.state.fl.us/water/groundwater/delineate.htm.

Figure 3 shows the Florida Groundwater Delineated Area, within which the Site is located. The Florida Groundwater Delineated Area restricts well installations.



Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding the EPA's response actions at the Site.

6.4 Data Review

LNAPL and Free-Product Recovery

Since ending operation of the bioslurper unit in September 2012, the PRP Group switched to quarterly monitoring of 12 groundwater wells and 32 recovery wells for the presence and level of petroleum LNAPL. Table 7 lists the amount of free product bailed and recovered for each period and the amount of treated groundwater since the previous FYR.

Table 7: Volume of Recovered LNAPL and Treated Groundwater from 2009-2012

Monitoring Period	Amount of LNAPL Recovered (gallons)	Groundwater Treated (gallons)
12/14/2009 – 3/15/2010	208	333,830
3/25/2010 – 6/14/2010	270	461,590
6/14/2010 – 9/13/2010	334	967,160
9/13/2010 – 12/12/2010	273	599,640
12/13/2010 – 3/13/2011	282	591,690
3/14/2011 – 6/12/2011	258	567,670
6/13/2011 – 9/11/2011	237	458,238
9/12/2011 – 12/12/2011	308	346,380
12/12/2011 – 3/11/2012	117	345,580
3/12/2012 – 6/10/2012	314	1,245,180
6/11/2012 – 9/30/2012	337	1,693,410
Totals	**2,938**	**7,610,368**

Groundwater

Groundwater results for each quarter indicated lead concentrations above regulatory standards. The July 2014 quarterly report also reported arsenic concentrations above regulatory standards. The interim ROD lists both lead and arsenic as COCs. Other contaminants detected at varying levels and frequencies above regulatory standards include: benzene, chlorobenzene, 1, 4-dioxane, bromodichloromethane and beta-hexachlorocyclohexane.

Vapor Intrusion

On February 15-17, 2011, EPA's Science and Ecosystem Support Division personnel conducted an air sampling study at the Site to assess VOC concentrations and the risk to human health. The study aimed to assess VOC concentrations from Warehouses 164 and 261, which contain open sumps and pools of exposed free product, and assess the "worst case scenario" exposure level of personnel working in these warehouse bays. The EPA issued the final sampling report on April 28, 2011.

In March 2014, the USACE prepared a supplemental human health risk assessment (HHRA) as part of the OU2/OU3 RI. The HHRA identified trespassers, tenants, indoor workers, outdoor workers, residents, and construction workers as potential receptors for vapor inhalation under current and future land uses. Several chemicals detected in indoor air in 2011 exceeded the 2014 EPA regional screening levels for residential and industrial air; however, no chemicals exceeded the occupational health levels or posed excess cancer risk. The 2011 concentrations measured during lower ambient wind conditions were further compared to EPA's June 2015 vapor intrusion screening levels (VISL) based on a current industrial use. The results indicate the concentration of 1,2,4-trimethylbenzene in Building 164 slightly exceeds the VISL; however, the indoor sample collected during higher wind conditions is well below the VISL. These results indicate that this exposure pathway should be evaluated using multiple lines of evidence as required by EPA's 2015 vapor intrusion guidance.

6.5 Site Inspection

A site inspection occurred on March 31, 2015. Site inspection participants included: Michael Taylor (EPA RPM), Brad Jackson (USACE), Kelsey Helton (FDEP), Jeff Ray (FDEP), and Johnny Zimmerman-Ward and Rosemary Han (Skeo Solutions).

The inspection team met at the Site and toured the property starting at the fenced-in area housing the bioslurper unit. The inspection team discussed the Site's status after the bioslurper remedy was discontinued (in September 2012) due to slow recovery performance and high operation costs. At the time of the inspection, the EPA was in the process of developing an RI/FS for OU2 (soil) with the assistance of USACE. After the inspection team discussed the remedy status, the team walked north toward Pembroke Road to inspect monitoring wells, the asphalt surface, the general condition of site structures and current warehouse tenants.

At the northern end of the Site, the inspection team noticed warning signs FDEP had posted to inform people about potential contamination at the Site. Some emergency contact numbers were illegible and several signs were missing. Inspection participants also noted the location and condition of site monitoring wells, many of which were not locked or had broken caps. After walking to the northwestern corner, the inspection team walked south to observe additional monitoring wells, a water spigot near a formerly seeping well and the building located above one of the former disposal pits. The team observed cracks in the asphalt near the gun range.

The inspection team walked south across Carolina Street to observe conditions at the Bamboo Park Mobile Homes. The team discussed the 2011 removal of contaminated soil from a mobile home property. Along Carolina Street, the inspection team observed damaged fencing indicative of trespassing at the southeast corner of the site property. The inspection team met with the current Master Tenant who operates the warehouses under a 30-year agreement with the property owner. The Master Tenant discussed planned cosmetic repairs and upgrades to the warehouses and asphalt.

Skeo Solutions visited the Broward County Main Library, the local information repository, and identified hard copies of the 1992 Administrative Record, the 1997 OU2 Administrative Record, and the 2005 FYR. The repository did not have a hard copy of the 2010 FYR and the librarian indicated that they are moving toward referencing or linking directly to online government databases for many documents. The completed site inspection checklist and the site inspection photo log are available in Appendices D and E, respectively.

6.6 Interviews

The FYR process included interviews with parties affected by the Site, including the current landowners and regulatory agencies involved in site activities or aware of the Site. The purpose was to document the perceived status of the Site and any perceived problems or successes with the phases of the remedy implemented to date. Interviews with the Master Tenant, a property manager and a tenant of the business park took place during the site inspection on March 31, 2015. Additional interviews with the RPM, the PRP Group consultant and FDEP took place over email. Interview summaries are below. Appendix C provides the complete interviews.

de maximis, inc. (PRP Group Consultant)
de maximis, inc. is the consultant for the PRP Group. The consultant commented that the bioslurping remedy was effective in removing oil/free product and remediating groundwater and that the current practice of monitoring and bailing as needed is functioning as intended. Typically, de maximis, inc. has not received complaints from neighboring residents. They respond to ensure that infrequent oil seeps are properly cleaned up when reported by warehouse tenants after heavy rainfall. The consultant indicated that the PRP Group has not received intermittent updates about RI activities for OU2 and OU3. They suggested that monthly calls would be a good way for the involved parties to develop the final ROD for OU2 and OU3.

Master Tenant (Pembroke Business Park)
The Master Tenant is aware of the Site's history, and said that project cleanup/reuse activities have not affected tenant activities at the property. The Master Tenant stated that there have been some minor issues with trespassing and petty theft. The Master Tenant became aware of the Site's history and the cleanup process in order to qualify for the Prospective Purchaser Agreement.

Michael Taylor (EPA Region 4 RPM)
Michael Taylor indicated that the bioslurping unit idled in October 2012 because the system was not collecting a significant amount of waste oil. As a result, the EPA has requested an alternative approach for OU1 product recovery that will fulfill the requirements of the OU1 Consent Decree. As an interim remedy, the EPA will continue monitoring activities and recovery of oil from perimeter wells on an ad hoc basis. Mr. Taylor also indicated that the EPA is continuing development of a RI/FS for OU2. Although the only institutional control in place is restriction of well installation in the Florida Groundwater Delineated Area, which includes the Site, the EPA is reviewing the need for additional institutional controls and restrictive covenants during the OU2 and OU3 assessment.

Regarding impacts to the surrounding community, he noted that community interest from warehouse tenants is minimal, except for a few issues related to noise or odors. A Master Tenant for the Pembroke Park Warehouses, who will look over the property for 30 years, received a Prospective Purchaser Agreement from the EPA. He noted that one new issue, since the previous FYR, is potential oil contamination on a property located west of the Site, called the Kelsey Property. FDEP is currently the lead agency on this property.

Senior Property Manager (Pembroke Business Park)
The property manager is aware of the Site's contamination and cleanup history. The property manager stated that they are aware of activities happening at the Site and are not aware of any current issues or complaints regarding the Site.

Tenant 1 (Pembroke Business Park)
This tenant understands that the business park is on an EPA site, but is not knowledgeable about the Site's contamination or cleanup history. The tenant is not aware of any problems with the Site. The tenant suggested that the EPA could share an emergency contact, in case of any future issues.

7.0 Technical Assessment

7.1 Question A: Is the remedy functioning as intended by the decision documents?

There are three OUs designated for this site. This FYR is for the review of OU1, product recovery. A remedy decision has not been completed for OU2 (soil) and OU3 (groundwater) at this time. Although the bioslurper unit functioned as designed the system no longer extracted free product at a desirable rate considering cumulative repair and operational costs. The PRP contractor idled the bioslurper unit on September 28, 2012. The PRP Group initially switched to quarterly monitoring with product collection, bailing, and cleanup of exposed free product on an as-needed basis. The USACE noted areas of LNAPL seepage during remedial investigations in 2012 and 2013. In the Pembroke Park Warehouses, LNAPL was observed rising through the ground in areas of low resistance, including cracks in the asphalt and next to extraction wells. In late 2014, the PRP Group initiated bi-weekly site assessments that include perimeter well checks and product collection. The remedy for product recovery is functioning with the bi-weekly collection of product from the site wells on a short term basis.

The owners of the Pembroke Park Warehouses know to inform the EPA and FDEP of any exposed free product or oil on the property if it is encountered. The tenants at the facility are informed by the Master Tenant and owner of this Superfund site and EPA's activities upon signing or renewing their lease/agreements.

During the FYR site inspection, several signs were missing. It is suspected some of the metal signs were taken for recyclable value. FDEP and the EPA replaced these signs after the site inspection. The signs have been placed around the property warning about potential hazardous substances and providing FDEP and EPA emergency contacts.

The southern end of the Site contains a fenced area. It includes the bioslurper unit equipment and storage for recovered LNAPL. During the site inspection, the fence at the southeastern corner of the Site was observed cut, creating an unsecured area in the security fence. This area identified was mentioned to the PRP Group and FDEP. The contractor made arrangements for repairing the fence after the inspection.

The Site and surrounding parcels fall within a Florida Groundwater Delineated Area. This is an institutional control that is currently in place. The Delineated Area inhibits consumption of contaminated groundwater by prohibiting placement of potable wells within the designated zone. In addition, public utilities provide drinking water to the Pembroke Park Warehouses and surrounding businesses and homes.

The EPA is working with USACE, FDEP, and the PRP Group to develop a ROD for OU2 and OU1. The ROD is scheduled for completion in FY2016.

7.2 Question B: Are the exposure assumptions, toxicity data, cleanup levels and remedial action objectives (RAOs) used at the time of remedy selection still valid?

The 1990 IAROD goal was to contain the contaminated groundwater plume and conduct product recovery actions to reduce site contamination. The 1990 decision document did not establish chemical specific ARARs for groundwater or soil COCs. The IAROD stated the selected interim remedy was not intended to meet MCLs for groundwater or address any applicable cleanup standards or regulation, and that cleanup goals would be established in the final ROD. The EPA will establish ARARs upon

completion of the OU2 RI/FS, during final remedy selection. The OU1/2 ROD is scheduled for completion in the fall of 2016.

7.3 Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

During the site inspection, the bioslurper unit and a few barrels containing collected free product were stored on the southern end of the property, surrounded by a fence with a locked gate. However, site inspection participants observed an area along Carolina Avenue where the fence was cut. This could present an access to the stored material. The issue was relayed to the PRP Group and contractor. Repairs to the fence were addressed after the site inspection.

No other information is known that would question the protectiveness of the remedy.

7.4 Technical Assessment Summary

The current, interim action remedy is functioning in the short-term for product recovery. The bioslurper unit was operational until late 2012. The recovery system continued with oil recovery but was diminishing in the volume of collected material. The PRP Group and FDEP decided to move actions toward a bi-weekly site monitoring and product collection from the perimeter wells. The collected material is temporarily stored in containers on-site in a secured area. Once an adequate volume of material is collected the contractor schedules for transportation to an off-site disposal facility. Alternative actions are being reviewed to enhance the volume of product recovery while a final remedy is being addressed. The final remedy for the OU2 will also address OU1.

The Site is within a Florida Groundwater Delineated Area, which restricts use of groundwater as potable water and installation of drinking water wells. However, there are no formal institutional controls in place to restrict certain activities, such as construction and digging. EPA and the FDEP have discussed the notification of site activities with the owner and Master Tenant. No site activities that would include digging or changes to site structures are permitted without their consent. The EPA is working on the RI/FS for OU2 and OU3, which will fully address contaminated soil and groundwater, as well as the need for institutional controls. As part of the OU2 and OU3 RI/FS, the EPA will continue to study the contaminant plume and the full extent of contamination that may affect surrounding properties. In addition, based on the results of the screening-level vapor intrusion evaluation it is recommended that this exposure pathway be evaluated using multiple lines of evidence using EPA's current vapor intrusion evaluation guidance.

8.0 Issues, Recommendations and Follow-up Actions

Table 8: Issues and Recommendations Identified in the Five-Year Review

OU(s): OU1	**Issue Category: Remedy Performance**			
	Issue: The OU1 remedy of product recovery no longer uses a bioslurping unit. The product recovery is through scheduled bi-weekly well inspections, product pumping, baling and off-site disposal until a final remedy is selected for OU1 (product recovery) and OU2 (soil).			
	Recommendation: Finalize the sitewide remedy.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Implementing Party**	**Oversight Party**	**Milestone Date**
No	Yes	EPA/State/PRP	EPA	12/14/2017

The following additional items, though not expected to affect protectiveness, warrant additional follow-up:

- The EPA recommends that FDEP or the PRP Group should replace or repair several broken well caps to ensure that no wells remain unsecured.
- The EPA recommends that FDEP should replace several stolen or missing signs that warned tenants and visitors about potential site contamination and listed emergency contact information.

9.0 Protectiveness Statement

Table 9: Protectiveness Statement

Operable Unit:	*Protectiveness Determination:*	*Addendum Due Date*
OU1	Short-term Protective	
Protectiveness Statement: *The remedy for OU1 is currently protective of human health and the environment in the short term. An Institutional Control, through a delineated area, is in place that prevents well placement without District office approval. Site wells are being monitored bi-weekly with removal of product in perimeter wells. The Site has scheduled inspections by a PRP and State contractor. In order for the remedy to be protective in the long term, a final remedy will need to be selected. A final remedy for OU1 (product recovery) and OU2 (soil) is scheduled for FY 2016.*		

10.0 Next Review

The next FYR will be due within five years of the signature/approval date of this FYR.

Appendix A: List of Documents Reviewed

Annual Report 2009 Petroleum Products Corporation NPL Site. Prepared by de maximis, inc. for EPA Region 4. March 10, 2010.

Annual Report 2010 Petroleum Products Corporation NPL Site. Prepared by de maximis, inc. for EPA Region 4. March 11, 2011.

Annual Report 2011 Petroleum Products Corporation NPL Site. Prepared by de maximis, inc. for EPA Region 4. March 30, 2012.

Baseline Risk Assessment for the Petroleum Products Corporation Superfund Site. Prepared by Clement International Corporation for EPA Region 4. June 17, 1992.

Draft Remedial Investigation Report for Former Petroleum Products Superfund Site. Prepared by U.S. Army Corps of Engineers for EPA Region 4. March 2014.

Explanation of Significant Differences for Petroleum Products Corporation Superfund Site Operable Unit 1. Prepared by EPA Region 4. March 11, 1991.

Explanation of Significant Differences for Petroleum Products Corporation Superfund Site Operable Unit 1. Prepared by EPA Region 4. August 3, 1998.

Final Report for Petroleum Products Air Study. Prepared by EPA Region 4. April 28, 2011.

First Five-Year Review Report for Petroleum Products Corporation Superfund Site. Prepared by EPA Region 4. September 8, 2000.

First Quarter Report 2012 Petroleum Products Corporation NPL Site. Prepared by de maximis inc. for EPA Region 4. May 30, 2012.

First Quarter Report 2013 Petroleum Products Corporation NPL Site. Prepared by de maximis inc. for EPA Region 4. June 14, 2013.

Interim Record of Decision for Petroleum Products Corp. Operable Unit 1. Prepared by EPA Region 4. October 5, 1990.

Quarterly Monitoring Report for Petroleum Products Corporation Superfund Site. Prepared by ECT for Florida Department of Environmental Protection. July 2014.

Second Five-Year Review Report for Petroleum Products Corporation Superfund Site. Prepared by EPA Region 4. December 20, 2005

Second Quarter Report 2012 Petroleum Products Corporation NPL Site. Prepared by de maximis inc. for EPA Region 4. August 14, 2012.

Second Quarter Report 2013 Petroleum Products Corporation NPL Site. Prepared by de maximis inc. for EPA Region 4. August 1, 2013.

Second Quarter Report 2014 Petroleum Products Corporation NPL Site. Prepared by de maximis inc. for EPA Region 4. August 11, 2014.

Semiannual Report 2014 for Petroleum Products Corporation NPL Site. Prepared by de maximis inc. for EPA Region 4. February 12, 2015.

Source Removal Event 1 PPC Bamboo Trailer Park. Prepared by ECT for Florida Department of Environmental Protection. January 2011.

Third Five-Year Review Report for Petroleum Products Corporation Superfund Site. Prepared by EPA Region 4. December 14, 2010.

Third Quarter Report 2012 Petroleum Products Corporation NPL Site. Prepared by de maximis inc. for EPA Region 4. December 5, 2012

Appendix B: Press Notice

The U. S. Environmental Protection Agency, Region 4
Announces a Five-Year Review for
The Petroleum Products Corp. Superfund Site,
Pembroke Park, Broward County, Florida

Purpose/Objective: EPA is conducting a Five-Year Review of the remedy for the Petroleum Products Corp. Superfund site (the Site) in Pembroke Park, Florida. The purpose of the Five-Year Review is to make sure the selected cleanup actions effectively protect human health and the environment.

Site Background: The 2-acre Site is a former used oil refining facility. The Site is located near two municipal water well fields for the cities of Hallandale and Hollywood. During the refining process, operators generated sulfuric acid sludge and contaminated clay, which was disposed of in on-site pits. Due to improper disposal practices as well as catastrophic oil spills, an estimated 30,000 to 125,000 gallons of used oil containing chlorinated solvents, transformer oil, and heavy metals contaminated the Biscayne aquifer, which is the primary aquifer for south Florida. In addition, about 130,000 cubic yards of contaminated soil continues to discharge oily materials, contaminating groundwater around the Site to a depth of about 50 feet below the ground surface. Major contaminants consist of chlorinated solvents, transformer oil, and heavy metals including lead, aluminum, chromium, iron, and manganese.

Cleanup Actions: The cleanup plan for the Site covers three operable units (OUs): OU1 (waste oil recovery), OU2 (soil), and OU3 (groundwater). EPA issued the OU1 Record of Decision (ROD) in 1990. EPA has not yet issued RODs for OU2 and OU3. Major components of the OU1 remedy include decommissioning the non-operating wells that remain on site; closing the storm drainage wells that deposit wastewater and stormwaters into the Biscayne aquifer; conducting a private well water survey to identify present groundwater users in the affected area; and modifying the present recovery system in an effort to remove a larger volume of oil from groundwater and to contain the contaminant plume. A bioslurping system (vacuum-enhanced recovery of waste oil) collected waste oil from the groundwater surface between 1999 and 2012. The system recovered more than 30,000 gallons of light non-aqueous phase liquids since EPA initiated the interim cleanup. Annual groundwater sampling and monitoring, which began in 2003, will continue to determine contaminant concentration levels, migration and overall effectiveness of the system.

Five-Year Review Schedule: The National Contingency Plan requires review of remedial actions that result in any hazardous substances, pollutants or contaminants remaining at the Site above levels that allow for unlimited use and unrestricted exposure every five years to ensure the protection of human health and the environment. The fourth of the Five-Year Reviews for the Site will be completed by December 2015.

EPA Invites Community Participation in the Five-Year Review Process: EPA is conducting this Five-Year Review to evaluate the effectiveness of the Site's remedy and to ensure that the remedy remains protective of human health and the environment. As part of the Five-Year Review process, EPA staff is available to answer any questions about the Site. Community members who have questions about the Site or the Five-Year Review process, or who would like to participate in a community interview, are asked to contact:

Michael Taylor, Remedial Project Manager
404-562-8762
taylor.michael@epa.gov

L'Tonya Spencer, Community Involvement Coordinator
404-562-8463 | 1-800-435-9234 (Toll Free)
spencer.latonya@epa.gov

Mailing Address: U.S. EPA Region 4, 61 Forsyth Street, S.W., 11th Floor, Atlanta, GA 30303-8960

Additional site information is also available at the Site's document repository, located at Broward County Public Library, 100 S. Andrews Ave. - Level 5, Ft. Lauderdale, Florida 33301 and online:
http://www.epa.gov/region4/superfund/sites/npl/florida/petroprofl.html

Appendix C: Interview Forms

Petroleum Products Corp. Superfund Site Five-Year Review Interview Form

Site Name:	**Petroleum Products Corp.**	**EPA ID No.:**	**FLD980798698**
Interviewer Name:	**Johnny Zimmerman-Ward**	**Affiliation:**	**Skeo Solutions**
Subject Name:	**Master Tenant**	**Affiliation:**	**Pembroke Business Park**
Subject Contact Information:			
Time:	**12:30 P.M.**	**Date:**	**3/31/2015**
Interview Location:	**Site**		

Interview Format (circle one): **(In Person)** **Phone** **Mail** **Other:**

Interview Category: **Master Tenant**

1. Are you aware of the former environmental issues at the Site and the cleanup activities that have taken place to date?

   Yes, in general. We did research about the Site before we took over.

2. What is your overall impression of the project, including cleanup, maintenance and reuse activities (as appropriate)?

   It has not affected us. We are aware of their presence and know to contact them if we spot anything.

3. What have been the effects of this Site on the surrounding community, if any?

   Other than this property, I am not aware of any effects.

4. Have there been any problems with unusual or unexpected activities at the Site, such as emergency response, vandalism or trespassing?

   No. There has been some minor trespassing with stolen lights or signs.

5. Has the EPA kept involved parties and surrounding neighbors informed of activities at the Site?

   Yes

6. Do you have any comments, suggestions or recommendations regarding the management or operation of the Site's remedy?

   No, so far it has been fine. We were made well aware of the Site and the process in order to qualify for the Prospective Purchaser Agreement.

Petroleum Products Corp. Superfund Site **Five-Year Review Interview Form**

Site Name:	**Petroleum Products Corp.**	**EPA ID No.:**	**FLD980798698**
Interviewer Name:	**Rosemary Han**	**Affiliation:**	**Skeo Solutions**
Subject Name:	**Michael Miller**	**Affiliation:**	**de maximis, inc.**
Subject Contact Information:	**865 691 5052**	**m2@demaximis.com**	
Time:		**Date:**	**April 29, 2015**
Interview Location:	**Interview via email**		
Interview Format (circle one):	**In Person**	**Phone**	**Mail** **Other: Email**

Interview Category: Potentially Responsible Party (PRP) Group

1. What is your overall impression of the remedial activities at the Site?

   As you know, the Site is divided into three operable units. The OU1 (waste oil recovery) has been under effective remediation since the 1990s. The great majority of the remediation work was accomplished by using a large scale bioslurper system for recovery of oil/free product removal, which removed 34,410 gallons of oil/free product. The bioslurper system was stopped in September 2012 as directed by FDEP. Oil/free product levels are currently being monitored and wells are hand bailed, as needed, when oil levels reach a certain level. OU2 (soils) and OU3 (groundwater) are currently in the stage of the EPA preparing the RI, HHRA and FS reports – activities that have been going on since 2009. In addition to the soil and groundwater sampling as a part of the RI for OU2/OU3, groundwater sampling continues on an annual basis as a part of ongoing monitoring of groundwater.

2. What have been the effects of this Site on the surrounding community, if any?

   There has been no discernible effect on the surrounding community. Site work regarding monitoring activities and past large scale bioslurper operations for recovery of free product (OU1) have not been an inconvenience to renters of warehouse space. Businesses in the warehouse spaces continued to operate throughout the operational period of the bioslurper system.

3. What is your assessment of the current performance of the remedy in place at the Site?

   The bioslurping remedy for OU1 was effective in removing oil/free product and also resulted in remediation to groundwater. The current monitoring and bailing for oil/free product is working to remove free product when the oil is over 3 inches deep at the wells being monitored. The remedies for OU2 and OU3 have not been selected.

4. Are you aware of any complaints or inquiries regarding environmental issues or the remedial action from residents since implementation of the cleanup?

   There have been no inquiries or complaints from neighboring residents. On a very infrequent basis, there are inquiries from warehouse tenants after observing oil seeps through the site pavement following heavy rain events. When reported, the oil seeps are quickly remedied and cleaned up.

5. Do you feel well-informed regarding the Site's activities and remedial progress? If not, how might EPA convey site-related information in the future?

   No. The [PRP] Group has received intermittent updates with regard to HHRA and RI activities for OU2 and OU3 being conducted by the COE [USACE] under EPA direction. Furthermore, it seems that estimated time frames by the Agency are always exceeded in terms of next steps and responses to the Group's comments on deliverables. The [PRP] Group has received no update in regard to the FS for OU2.

6. Do you have any comments, suggestions or recommendations regarding the management or operation of the Site's remedy?

   Regular contact with the agencies would help keep everyone informed as to status. A standing monthly call, for example, could be of benefit. The agencies and the remaining parties need to work together to achieve a final ROD for the Site in an expedited manner. The ACOE's [USACE's] work to achieve this goal has taken too long, has been of poor quality, and has delayed the resolution of the final OUs.

Petroleum Products Corp. Superfund Site **Five-Year Review Interview Form**

Site Name:	**Petroleum Products Corp.**	**EPA ID No.:**	**FLD980798698**
Interviewer Name:	**Rosemary Han**	**Affiliation:**	**Skeo Solutions**
Subject Name:	**Michael Taylor**	**Affiliation:**	**EPA Region 4**
Subject Contact Information:			
Time:	**9am**	**Date:**	**4/7/2015**
Interview Location:	**SNAFC, Atlanta, GA**		

Interview Format (circle one): **In Person** **Phone** **Mail** **(Other: Email)**

Interview Category: EPA Remedial Project Manager

1. What is your overall impression of the project, including cleanup, maintenance, and reuse activities (as appropriate)?

   The bioslurping unit was idled in October 2012. The PRP Group and FDEP indicated the system was not collecting a significant volume of waste oil to continue the process. The EPA has requested an alternative approach to address the OU1 (product recovery). The EPA and the PRP Group has a Consent Decree for OU1 and expects the requirements from the group to be fulfilled and their obligations to this site addressed. Meanwhile, the EPA, through an Interagency Agreement, continues with the RI/FS for OU2 (soil).

2. What have been the effects of this Site on the surrounding community, if any?

   The surrounding community has expressed minimal interest in the day to day activities since the majority of work on OU1 has been unseen due to collecting oil from the groundwater surface. The dominant issues in the past have been odor and noise related. These issues are secondary to the multiple business activities that are being conducted throughout the rental facility and around the Site. The Site is located in a very congested and highly populated area.

3. Are you aware of any complaints or inquiries regarding site-related environmental issues or remedial activities since the implementation of the cleanup?

   There have not been any new complaints since the previous Five Year Review report. The Kelsey Property, located at the corner of Park Road and Carolina Street, remains to be of interest with the State's involvement and the concerns of oil contamination on the property. The Site has a new Master Tenant which received a Prospective Purchaser Agreement from the EPA. The new Master Tenant has signed a 30 year lease with the property owner to care for the property.

4. What is your assessment of the current performance of the remedy in place at the Site?

   The current remedy is an interim remedy for product recovery identified as OU1. The recovery of product was through the process of the bioslurping system which has been turned off since October 2012. The current assessment appears to be a monitoring activity with occasional collection of waste

oil if identified in the perimeter wells. The current situation is a temporary solution but not a permanent remedy for this site.

5. Are you comfortable with the status of the institutional controls at the Site? If not, what are the associated outstanding issues?

   The Site continues to be in a State Delineated Area, which is a form of institutional control. This designation prevents the installation of wells for irrigation and potable water. Additional ICs and restrictive covenants associated with this facility will be reviewed during the OU2 and OU3 assessments.

6. Are you aware of any community concerns regarding the Site or the operation and management of its remedy? If so, please provide details.

   I am not aware of any new concerns since the previous five year review.

7. Do you have any comments, suggestions, or recommendations regarding the management or operation of the Site's remedy?

   The EPA is currently conducting investigations for OU2 (soil) and OU3 (groundwater). This review addresses the OU1 (product recovery). The bioslurping unit was operational until October 2012. The PRP Group should continue to address the OU1 component as agreed within the Consent Decree.

Petroleum Products Corp. Superfund Site Five-Year Review Interview Form

Site Name:	**Petroleum Products Corp.**	**EPA ID No.:**	**FLD980798698**
Interviewer Name:	**Rosemary Han**	**Affiliation:**	**Skeo Solutions**
Subject Name:	**Senior Property Manager**	**Affiliation:**	**Pembroke Business Park**
Subject Contact Information:			
Time:	**1:00 P.M.**	**Date:**	**3/31/2015**
Interview Location:	**Leasing Office**		

Interview Format (circle one): **(In Person)** **Phone** **Mail** **Other:**

Interview Category: **Property Manager**

1. Are you aware of the former environmental issues at the Site and the cleanup activities that have taken place to date?

   Yes.

2. What is your overall impression of the project, including cleanup, maintenance, and reuse activities (as appropriate)?

   It is all fine.

3. What have been the effects of this Site on the surrounding community, if any?

   None.

4. Have there been any problems with unusual or unexpected activities at the Site, such as emergency response, vandalism, or trespassing?

   No.

5. Are you aware of any complaints or inquiries regarding environmental issues or the remedial action from residents since implementation of the cleanup?

   No.

6. Do you feel well-informed regarding the Site's activities and remedial progress? If not, how might the EPA convey site-related information in the future?

   Yes, normally EPA, USACE, and other contractors keep us informed when they visit.

7. Do you have any comments, suggestions, or recommendations regarding any aspects of the project?

   No.

Petroleum Products Corp. Superfund Site Five-Year Review Interview Form

Site Name:	**Petroleum Products Corp.**	**EPA ID No.:**	**FLD980798698**
Interviewer Name:	**Johnny Zimmerman-Ward**	**Affiliation:**	**Skeo Solutions**
Subject Name:	**Tenant 1**	**Affiliation:**	
Subject Contact Information:			
Time:	**11:00 A. M.**	**Date:**	**3/31/2015**
Interview Location:	**Site**		

Interview Format (circle one): **In Person** **Phone** **Mail** **Other:**

Interview Category: **Tenants/Surrounding Businesses**

1. Are you aware of the former environmental issues at the Site and the cleanup activities that have taken place to date?

   I know we are on an EPA site, but that is all.

2. What is your overall impression of the project, including cleanup, maintenance, and reuse activities (as appropriate)?

   I guess they are doing their job because we have never had seeps or problems.

3. What have been the effects of this Site on the surrounding community, if any?

   No idea. Nothing has ever been brought to my attention.

4. Have there been any problems with unusual or unexpected activities at the Site, such as emergency response, vandalism, or trespassing?

   No.

5. Are you aware of any complaints or inquiries regarding environmental issues or the remedial action from residents since implementation of the cleanup?

   No.

6. Do you feel well informed regarding the Site's activities and remedial progress? If not, how might the EPA convey site-related information in the future?

   We know about the Site. Unless something was hazardous, it would not impact me.

7. Do you have any comments, suggestions, or recommendations regarding any aspects of the project?

   If something was an issue, maybe an emergency contact.

Appendix D: Site Inspection Checklist

FIVE-YEAR REVIEW SITE INSPECTION CHECKLIST

I. SITE INFORMATION

Site Name: Petroleum Products Corp.	**Date of Inspection:** 3/31/2015
Location and Region: Pembroke Park, Broward County, Florida	**EPA ID:** FLD980798698
Agency, Office or Company Leading the Five-Year Review: EPA Region 4	**Weather/Temperature:** Sunny and clear sky/75°F

Remedy Includes: (Check all that apply)

- ☐ Landfill cover/containment
- ☒ Access controls
- ☒ Institutional controls
- ☐ Groundwater pump and treatment
- ☐ Surface water collection and treatment
- ☒ Other: Oil recovery
- ☐ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls

Attachments: ☒ Inspection team roster attached ☐ Site map attached

II. INTERVIEWS (check all that apply)

1. **O&M Site Manager** ____ (Name) ____ (Title) ____ (Date)
   Interviewed ☐ at site ☐ at office ☐ by phone Phone: ____
   Problems, suggestions ☐ Report attached: ____

2. **O&M Staff** ____ (Name) ____ (Title) ____ (Date)
   Interviewed ☐ at site ☐ at office ☐ by phone Phone: ____
   Problems/suggestions ☐ Report attached: ____

3. **Local Regulatory Authorities and Response Agencies** (i.e., state and tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices). Fill in all that apply.

   Agency Florida Department of Environmental Protection
   Contact Kelsey Helton ____ (Name) ____ (Title) ____ (Date) ____ (Phone No.)
   Problems/suggestions ☐ Report attached: ____

   Agency Florida Department of Environmental Protection
   Contact Jeff Ray ____ (Name) ____ (Title) ____ (Date) ____ (Phone No.)
   Problems/suggestions ☐ Report attached: ____

   Agency ____
   Contact ____ (Name) ____ (Title) ____ (Date) ____ (Phone No.)
   Problems/suggestions ☐ Report attached: ____

   Agency ____
   Contact ____ (Name) ____ (Title) ____ (Date) ____ (Phone No.)
   Problems/suggestions ☐ Report attached: ____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone No.
Problems/suggestions ☐ Report attached:_____

4. **Other Interviews** (optional) ☒ Report attached: _____

Master Tenant, Pembroke Business Park

Property Manager, Pembroke Business Park

Tenant 1

III. ON-SITE DOCUMENTS AND RECORDS VERIFIED (check all that apply)

1. **O&M Documents**

☐ O&M manual	☐ Readily available	☐ Up to date	☒ N/A
☐ As-built drawings	☐ Readily available	☐ Up to date	☒ N/A
☐ Maintenance logs	☐ Readily available	☐ Up to date	☒ N/A

Remarks: _____

2. **Site-Specific Health and Safety Plan** ☐ Readily available ☐ Up to date ☒ N/A

☐ Contingency plan/emergency response plan ☐ Readily available ☐ Up to date ☒ N/A

Remarks: _____

3. **O&M and OSHA Training Records** ☐ Readily available ☐ Up to date ☒ N/A

Remarks: _____

4. **Permits and Service Agreements**

☐ Air discharge permit	☐ Readily available	☐ Up to date	☒ N/A
☐ Effluent discharge	☐ Readily available	☐ Up to date	☒ N/A
☐ Waste disposal, POTW	☐ Readily available	☐ Up to date	☒ N/A
☐ Other permits: _____	☐ Readily available	☐ Up to date	☒ N/A

Remarks: _____

5. **Gas Generation Records** ☐ Readily available ☐ Up to date ☒ N/A

Remarks: _____

6. **Settlement Monument Records** ☐ Readily available ☐ Up to date ☒ N/A

Remarks: _____

7. **Ground Water Monitoring Records** ☐ Readily available ☐ Up to date ☒ N/A

Remarks: _____

8. **Leachate Extraction Records** ☐ Readily available ☐ Up to date ☒ N/A

Remarks: _____

9. **Discharge Compliance Records**

☐ Air	☐ Readily available	☐ Up to date	☒ N/A

☐ Water (effluent) ☐ Readily available ☐ Up to date ☒ N/A

Remarks: _____

10. **Daily Access/Security Logs** ☐ Readily available ☐ Up to date ☒ N/A

Remarks: _____

IV. O&M COSTS

1. **O&M Organization**

☐ State in-house ☒ Contractor for state

☐ PRP in-house ☐ Contractor for PRP

☐ Federal facility in-house ☐ Contractor for Federal facility

☐ _____

2. **O&M Cost Records**

☒ Readily available ☒ Up to date

☐ Funding mechanism/agreement in place ☐ Unavailable

Original O&M cost estimate: _____ ☐ Breakdown attached

Total annual cost by year for review period if available

From: 1/1/2010 Date	To: 12/31/2010 Date	$600,000 Total cost	☐ Breakdown attached
From: 1/1/2011 Date	To: 12/31/2011 Date	$600,000 Total cost	☐ Breakdown attached
From: 1/1/2012 Date	To: 12/31/2012 Date	$450,000 Total cost	☐ Breakdown attached

3. **Unanticipated or Unusually High O&M Costs during Review Period**

Describe costs and reasons: _____

V. ACCESS AND INSTITUTIONAL CONTROLS ☒ Applicable ☐ N/A

A. Fencing

1. **Fencing Damaged** ☐ Location shown on site map ☒ Gates secured ☐ N/A

Remarks: The warehouses are accessible through entry roads, but a fence does surround the city-owned parcel housing the discontinued bioslurper equipment. There is a small gap on the southeast corner of the perimeter fence, suggesting possible trespassing.

B. Other Access Restrictions

1. **Signs and Other Security Measures** ☐ Location shown on site map ☐ N/A

Remarks: FDEP installed several warning signs about the presence of hazardous materials with a listed emergency contact number. Some signs were stolen or removed.

C. Institutional Controls (ICs)

1. **Implementation and Enforcement**

Site conditions imply ICs not properly implemented ☐ Yes ☒ No ☐ N/A

Site conditions imply ICs not being fully enforced ☐ Yes ☒ No ☐ N/A

Type of monitoring (e.g., self-reporting, drive by): _____

Frequency: _____

Responsible party/agency: _____

Contact _____ _____ _____ _____

Name Title Date Phone no.

Reporting is up to date ☐ Yes ☐ No ☒ N/A

Reports are verified by the lead agency ☐ Yes ☐ No ☒ N/A

Specific requirements in deed or decision documents have been met ☐ Yes ☐ No ☒ N/A

Violations have been reported ☐ Yes ☐ No ☒ N/A

Other problems or suggestions: ☐ Report attached

2. **Adequacy** ☐ ICs are adequate ☒ ICs are inadequate ☐ N/A

Remarks: No ICs are in place other than the restrictions on the creation of new wells, because the Site is in a Florida Groundwater Delineated Area.

D. General

1. **Vandalism/Trespassing** ☐ Location shown on site map ☒ No vandalism evident

Remarks: Circumstantial evidence of scrap metal or sign theft and hole cut in fence.

2. **Land Use Changes On Site** ☐ N/A

Remarks: The Site will continue to be used as industrial and commercial warehouses and storage units for a variety of businesses.

3. **Land Use Changes Off Site** ☐ N/A

Remarks: Areas around the Site are generally commercial or industrial use, with residential areas directly to the south.

VI. GENERAL SITE CONDITIONS

A. Roads ☒ Applicable ☐ N/A

1. **Roads Damaged** ☐ Location shown on site map ☒ Roads adequate ☐ N/A

Remarks: There are some potholes on the paved roadways of the Site; the Mater Tenant expressed plans to place a new asphalt layer over the roads and paved areas within the complex.

B. Other Site Conditions

Remarks: _____

VII. LANDFILL COVERS ☐ Applicable ☒ N/A

A. Landfill Surface

1. **Settlement** (low spots) ☐ Location shown on site map ☐ Settlement not evident

Arial extent: _____ Depth: _____

Remarks: _____

2.	**Cracks**	☐ Location shown on site map	☐ Cracking not evident
	Lengths: _____	Widths: _____	Depths: _____
	Remarks: _____		
3.	**Erosion**	☐ Location shown on site map	☐ Erosion not evident
	Arial extent: _____		Depth: _____
	Remarks: _____		
4.	**Holes**	☐ Location shown on site map	☐ Holes not evident
	Arial extent: _____		Depth: _____
	Remarks: _____		
5.	**Vegetative Cover**	☐ Grass	☐ Cover properly established
	☐ No signs of stress	☐ Trees/shrubs (indicate size and locations on a diagram)	
	Remarks: _____		
6.	**Alternative Cover** (e.g., armored rock, concrete)		☐ N/A
	Remarks: _____		
7.	**Bulges**	☐ Location shown on site map	☐ Bulges not evident
	Arial extent: _____		Height: _____
	Remarks: _____		
8.	**Wet Areas/Water Damage**	☐ Wet areas/water damage not evident	
	☐ Wet areas	☐ Location shown on site map	Arial extent: _____
	☐ Ponding	☐ Location shown on site map	Arial extent: _____
	☐ Seeps	☐ Location shown on site map	Arial extent: _____
	☐ Soft subgrade	☐ Location shown on site map	Arial extent: _____
	Remarks: _____		
9.	**Slope Instability**	☐ Slides	☐ Location shown on site map
	☐ No evidence of slope instability		
	Arial extent: _____		
	Remarks: _____		
B. Benches		☐ Applicable	☐ N/A
	(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)		
1.	**Flows Bypass Bench**	☐ Location shown on site map	☐ N/A or okay
	Remarks: _____		
2.	**Bench Breached**	☐ Location shown on site map	☐ N/A or okay
	Remarks: _____		

3.	**Bench Overtopped**	☐ Location shown on site map	☐ N/A or okay
	Remarks: _____		
C. Letdown Channels		☐ Applicable	☐ N/A
	(Channel lined with erosion control mats, riprap, grout bags or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)		
1.	**Settlement** (Low spots)	☐ Location shown on site map	☐ No evidence of settlement
	Arial extent: _____		Depth: _____
	Remarks: _____		
2.	**Material Degradation**	☐ Location shown on site map	☐ No evidence of degradation
	Material type:_____		Arial extent: _____
	Remarks: _____		
3.	**Erosion**	☐ Location shown on site map	☐ No evidence of erosion
	Arial extent: _____		Depth: _____
	Remarks: _____		
4.	**Undercutting**	☐ Location shown on site map	☐ No evidence of undercutting
	Arial extent: _____		Depth: _____
	Remarks: _____		
5.	**Obstructions**	Type: _____	☐ No obstructions
	☐ Location shown on site map	Arial extent: _____	
	Size: _____		
	Remarks: _____		
6.	**Excessive Vegetative Growth**	Type: _____	
	☐ No evidence of excessive growth		
	☐ Vegetation in channels does not obstruct flow		
	☐ Location shown on site map	Arial extent: _____	
	Remarks: _____		
D. Cover Penetrations		☐ Applicable	☐ N/A
1.	**Gas Vents**	☐ Active	☐ Passive
	☐ Properly secured/locked	☐ Functioning	☐ Routinely sampled ☐ Good condition
	☐ Evidence of leakage at penetration		☐ Needs maintenance ☐ N/A
	Remarks: _____		
2.	**Gas Monitoring Probes**		
	☐ Properly secured/locked	☐ Functioning	☐ Routinely sampled ☐ Good condition
	☐ Evidence of leakage at penetration		☐ Needs maintenance ☐ N/A
	Remarks: _____		

3. **Monitoring Wells** (within surface area of landfill)

☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition

☐ Evidence of leakage at penetration ☐ Needs maintenance ☐ N/A

Remarks: _____

4. **Extraction Wells Leachate**

☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition

☐ Evidence of leakage at penetration ☐ Needs maintenance ☐ N/A

Remarks: _____

5. **Settlement Monuments** ☐ Located ☐ Routinely surveyed ☐ N/A

Remarks: _____

E. Gas Collection and Treatment ☐ Applicable ☐ N/A

1. **Gas Treatment Facilities**

☐ Flaring ☐ Thermal destruction ☐ Collection for reuse

☐ Good condition ☐ Needs maintenance

Remarks: _____

2. **Gas Collection Wells, Manifolds and Piping**

☐ Good condition ☐ Needs maintenance

Remarks: _____

3. **Gas Monitoring Facilities** (e.g., gas monitoring of adjacent homes or buildings)

☐ Good condition ☐ Needs maintenance ☐ N/A

Remarks: _____

F. Cover Drainage Layer ☐ Applicable ☐ N/A

1. **Outlet Pipes Inspected** ☐ Functioning ☐ N/A

Remarks: _____

2. **Outlet Rock Inspected** ☐ Functioning ☐ N/A

Remarks: _____

G. Detention/Sedimentation Ponds ☐ Applicable ☐ N/A

1. **Siltation** Area extent: _____ Depth: _____ ☐ N/A

☐ Siltation not evident

Remarks: _____

2. **Erosion** Area extent: _____ Depth: _____

☐ Erosion not evident

Remarks: _____

3. **Outlet Works** ☐ Functioning ☐ N/A

Remarks: _____

4.	**Dam**	☐ Functioning	☐ N/A
	Remarks: _____		
H. Retaining Walls		☐ Applicable	☐ N/A
1.	**Deformations**	☐ Location shown on site map	☐ Deformation not evident
	Horizontal displacement: _____		Vertical displacement: _____
	Rotational displacement: _____		
	Remarks: _____		
2.	**Degradation**	☐ Location shown on site map	☐ Degradation not evident
	Remarks: _____		
I. Perimeter Ditches/Off-Site Discharge		☐ Applicable	☐ N/A
1.	**Siltation**	☐ Location shown on site map	☐ Siltation not evident
	Area extent: _____		Depth: _____
	Remarks: _____		
2.	**Vegetative Growth**	☐ Location shown on site map	☐ N/A
	☐ Vegetation does not impede flow		
	Area extent: _____		Type: _____
	Remarks: _____		
3.	**Erosion**	☐ Location shown on site map	☐ Erosion not evident
	Area extent: _____		Depth: _____
	Remarks: _____		
4.	**Discharge Structure**	☐ Functioning	☐ N/A
	Remarks: _____		
VIII. VERTICAL BARRIER WALLS		☐ Applicable	☒ N/A
1.	**Settlement**	☐ Location shown on site map	☐ Settlement not evident
	Area extent: _____		Depth: _____
	Remarks: _____		
2.	**Performance Monitoring**	Type of monitoring: _____	
	☐ Performance not monitored		
	Frequency: _____		☐ Evidence of breaching
	Head differential: _____		
	Remarks: _____		
IX. GROUND WATER/SURFACE WATER REMEDIES		☐ Applicable	☒ N/A
A. Ground Water Extraction Wells, Pumps and Pipelines		☐ Applicable	☐ N/A
1.	**Pumps, Wellhead Plumbing and Electrical**		
	☐ Good condition	☐ All required wells properly operating	☐ Needs maintenance ☐ N/A

Remarks: _____

2. **Extraction System Pipelines, Valves, Valve Boxes and Other Appurtenances**

☐ Good condition ☐ Needs maintenance

Remarks: _____

3. **Spare Parts and Equipment**

☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided

Remarks: _____

B. Surface Water Collection Structures, Pumps and Pipelines ☐ Applicable ☐ N/A

1. **Collection Structures, Pumps and Electrical**

☐ Good condition ☐ Needs maintenance

Remarks: _____

2. **Surface Water Collection System Pipelines, Valves, Valve Boxes and Other Appurtenances**

☐ Good condition ☐ Needs maintenance

Remarks: _____

3. **Spare Parts and Equipment**

☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided

Remarks: _____

C. Treatment System ☐ Applicable ☐ N/A

1. **Treatment Train** (check components that apply)

☐ Metals removal ☐ Oil/water separation ☐ Bioremediation

☐ Air stripping ☐ Carbon adsorbers

☐ Filters: _____

☐ Additive (e.g., chelation agent, flocculent): _____

☐ Others: _____

☐ Good condition ☐ Needs maintenance

☐ Sampling ports properly marked and functional

☐ Sampling/maintenance log displayed and up to date

☐ Equipment properly identified

☐ Quantity of ground water treated annually: _____

☐ Quantity of surface water treated annually: _____

Remarks: _____

2. **Electrical Enclosures and Panels** (properly rated and functional)

☐ N/A ☐ Good condition ☐ Needs maintenance

Remarks: _____

3. **Tanks, Vaults, Storage Vessels**

☐ N/A ☐ Good condition ☐ Proper secondary containment ☐ Needs maintenance

Remarks: _____

4. **Discharge Structure and Appurtenances**

☐ N/A ☐ Good condition ☐ Needs maintenance

Remarks: _____

5. **Treatment Building(s)**

☐ N/A ☐ Good condition (esp. roof and doorways) ☐ Needs repair

☐ Chemicals and equipment properly stored

Remarks: _____

6. **Monitoring Wells** (pump and treatment remedy)

☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition

☐ All required wells located ☐ Needs maintenance ☐ N/A

Remarks: _____

D. Monitoring Data

1. **Monitoring Data**

☐ Is routinely submitted on time ☐ Is of acceptable quality

2. **Monitoring Data Suggests:**

☐ Ground water plume is effectively contained ☐ Contaminant concentrations are declining

E. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)

☐ Properly secured/locked ☒ Functioning ☒ Routinely sampled ☒ Good condition

☐ All required wells located ☐ Needs maintenance ☐ N/A

Remarks: Some wells had covers flipped up and one monitoring well did not have a properly fitting cover. Wells may need to be properly locked and secured.

X. OTHER REMEDIES

If there are remedies applied at the Site and not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is designed to accomplish (e.g., to contain contaminant plume, minimize infiltration and gas emissions).

	The objective of the OU1 remedy is to contain contamination until the EPA and FDEP identify a method for source control and remedial actions for soil and groundwater. The bioslurper system for extracting LNAPL and oil product from groundwater stopped operating in 2012, due to inefficiency and high costs associated with its operation. No active remedy is currently in place. At the time of the inspection, the EPA and USACE were working on the RI/FS for OU2 (soil), which may enable continued cleanup of OU1.
B.	**Adequacy of O&M**
	Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy. At the time of the FYR, there was no active O&M at the Site other than groundwater monitoring.
C.	**Early Indicators of Potential Remedy Problems**
	Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future. Ending the use of a bioslurper left the Site with no active remedy. Other than the restrictions on well installation under the requirements of the Florida Groundwater Delineated Area, there are no ICs to restrict the use of existing wells or prohibit activities that may lead to uncontrolled exposure scenarios. The current property manager is generally aware of the environmental issues and knows to notify authorities if any oil surfaces through the ground, but this is not an adequate measure to control potential exposure to contaminated materials or prohibit activities that may create new exposure pathways while future remedial actions are pending. Additional remedial investigation may be required to determine the full extent of oil and contaminant migration.
D.	**Opportunities for Optimization**
	Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy. The EPA and FDEP could consider implementing ICs in the form of restrictive covenants on impacted site parcels which would prohibit inappropriate use until a ROD is in place for OU2 and OU3. The EPA and FDEP should also properly secure monitoring and extraction wells and replace missing signs around the warehouse complex.

Site Inspection Team
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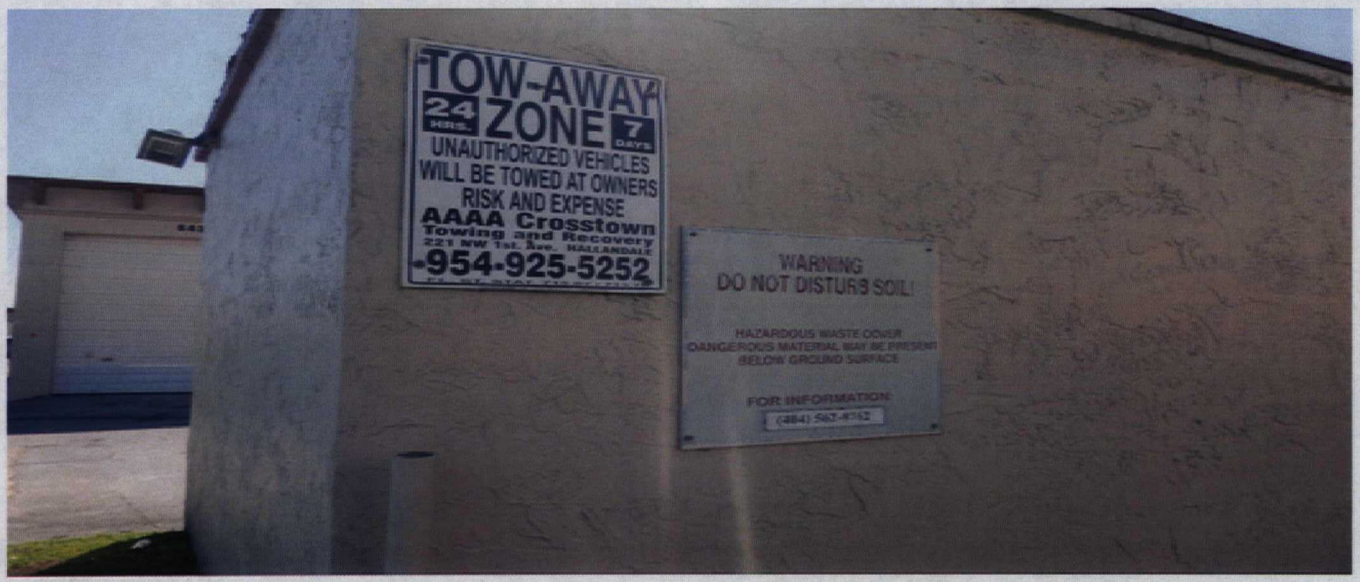
Appendix E: Photographs from Site Inspection Visit

Locked and secured entry gate to the bioslurping unit on the southern end of the Site.

Access point to the bioslurping unit drainage pipes in an alleyway.

View of the alleyway between warehouse buildings near the source area, facing south, with the bioslurping unit access points and monitoring wells in the middle.



Warning sign about disturbing contaminated soils and materials at the Site with emergency contact information.

A water spigot mounted on the side of a warehouse building and evidence of an oil seepage at a well.

Unoccupied trailer where the EPA conducted a 2011 removal of soil and contaminated sludge.

Appendix F: July 2014 Quarterly Groundwater Monitor and Analytical Summary

TABLE 1A: GROUNDWATER MONITORING WELL ANALYTICAL SUMMARY - VOCs and Metals

Facility ID#:068732618 **Facility Name: Petroleum Products Corporation (PPC)**

Analyte		Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE	EDB	1,2-Dichloroethane	Total Arsenic	Cadmium	Total Chromium	Total Lead
Location	Date	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)
SBLPMW-7A	11/06/2013	NS	NS	NS	NS	NS	NS	NS	5.0 U	NS	NS	6.0 U
	3/21/2014	NS	NS	NS	NS	NS	NS	NS	5.0 U	NS	NS	6.0 U
	6/5/2014	NS	NS	NS	NS	NS	NS	NS	5.0 U	NS	NS	6.0 U
SBLPMW-8A	11/05/2013	NS	NS	NS	NS	NS	NS	NS	5.0 U	NS	NS	6.0 U
SPPW-03A	11/06/2013	NS	NS	NS	NS	NS	NS	NS	5.0 U	NS	NS	6.0 U
SPPW-03D	11/06/2013	NS	NS	NS	NS	NS	NS	NS	5.0 U	NS	NS	7.11
MW-A	11/05/2013	NS	NS	NS	NS	NS	NS	NS	6.11	NS	NS	6.0 U
	11/15/2013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	3/20/2014	0.10 U	0.50 U	0.50 U	0.50 U	3.50 U	NS	0.50 U	5.0 U	NS	NS	5.0 U
	6/6/2014	0.10 U	0.50 U	0.50 U	0.50 U	3.50 U	NS	0.50 U	5.0 U	NS	NS	5.0 U
MW-B	11/05/2013	NS	NS	NS	NS	NS	NS	NS	7.11	NS	NS	5.0 U
	3/20/2014	0.10 U	0.50 U	0.50 U	0.50 U	3.50 U	NS	0.50 U	5.0 U	NS	NS	5.0 U
	6/6/2014	0.10 U	0.50 U	0.50 U	0.50 U	3.50 U	NS	0.50 U	5.0 U	NS	NS	5.0 U
MW-E	11/05/2013	NS	NS	NS	NS	NS	NS	NS	5.0 U	NS	NS	5.0 U
MW-G	11/05/2013	NS	NS	NS	NS	NS	NS	NS	5.0 U	NS	NS	5.0 U
MW-J	11/05/2013	NS	NS	NS	NS	NS	NS	NS	5.0 U	NS	NS	8.21
	3/20/2014	NS	NS	NS	NS	NS	NS	NS	5.0 U	NS	NS	[illegible]
	6/5/2014	NS	NS	NS	NS	NS	NS	NS	5.0 U	NS	NS	[illegible]
PMW-04A	11/05/2013	NS	NS	NS	NS	NS	NS	NS	5.0 U	NS	NS	5.0 U
PMW-05A	11/05/2013	NS	NS	NS	NS	NS	NS	NS	5.0 U	NS	NS	6.91
PMW-07A	3/20/2014	NS	NS	NS	NS	NS	NS	NS	5.0 U	NS	NS	5.0 U
	6/5/2014	NS	NS	NS	NS	NS	NS	NS	15.6	NS	NS	5.0 U
PMW-10A	11/05/2013	0.10 U	0.50 U	0.50 U	0.50 U	0.50 U	NS	NS	5.0 U	NS	NS	[illegible]
PMW-15A	11/05/2013	NS	NS	NS	NS	NS	NS	NS	5.0 U	NS	NS	5.0 U
PMW-19A	11/05/2013	NS	NS	NS	NS	NS	NS	NS	5.0 U	NS	NS	13.2
PMW-21A	11/05/2013	NS	NS	NS	NS	NS	NS	NS	5.0 U	NS	NS	5.0 U
PZ-03S	11/06/2013	0.10 U	0.50 U	0.50 U	0.50 U	0.50 U	NS	NS	5.0 U	NS	NS	6.91
	11/15/2013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
COEMW-03	3/20/2014	0.10 U	0.50 U	0.50 U	0.50 U	5.9	NS	0.50 U	5.0 U	NS	NS	5.0 U
	6/5/2014	0.10 U	0.50 U	0.50 U	0.50 U	14.0	NS	0.50 U	5.0 U	NS	NS	5.0 U
COEMW-9	3/21/2014	3.0	1.4	0.881	2.3	0.50 U	NS	0.50 U	5.0 U	NS	NS	6.0 U
	6/5/2014	4.0	1.6	0.771	2.0	0.50 U	NS	0.50 U	5.0 U	NS	NS	5.0 U
COEMW-11A	3/21/2014	NS	NS	NS	NS	NS	NS	NS	5.0 U	NS	NS	5.0 U
	6/6/2014	NS	NS	NS	NS	NS	NS	NS	5.0 U	NS	NS	5.0 U
COEMW-13A	3/21/2014	0.17 J	0.50 U	0.50 U	0.50 U	0.50 U	NS	0.50 U	5.0 U	NS	NS	5.0 U
	6/5/2014	0.10 U	0.50 U	0.50 U	0.50 U	0.50 U	NS	0.50 U	5.0 U	NS	NS	5.0 U
COEMW-15A	3/20/2014	NS	NS	NS	NS	NS	NS	NS	5.0 U	NS	NS	[illegible]
	6/6/2014	NS	NS	NS	NS	NS	NS	NS	5.0 U	NS	NS	[illegible]
RW11-OW2	3/21/2014	NS	NS	NS	NS	NS	NS	NS	5.0 U	NS	NS	[illegible]
	6/5/2014	NS	NS	NS	NS	NS	NS	NS	5.0 U	NS	NS	[illegible]
FDEP-OW1	3/21/2014	0.12 I	0.50 U	0.50 U	0.50 U	0.50 U	NS	0.50 U	5.0 U	NS	NS	[illegible]
	6/5/2014	0.10 U	0.50 U	0.50 U	0.50 U	0.50 U	NS	0.50 U	5.0 U	NS	NS	[illegible]
GCTLs		1	40	30	20	20	.02	3	10	5	100	15
NADCs		100	400	300	200	200	3	300	100	50	1000	150

Notes:
NA = Not Available
NS = Not Sampled
GCTLs = Groundwater Cleanup Target Levels specified in Table I of Chapter 62-777, F.A.C.
NADCs = Natural Attenuation Default Source Concentrations specified in Table I of Chapter 62-777, F.A.C.
Exceeds GCTL Limit
Exceeds NADC Limit

TABLE 1B: GROUNDWATER MONITORING WELL ANALYTICAL SUMMARY - PAHs and TRPHs

Facility ID#:868732618 — **Facility Name: Petroleum Products Corporation (PPC)**

See notes at end of table.

Sample		TRPHs	Naph-thalene	1-Methyl-naph-thalene	2-Methyl-naph-thalene	Acenaph-thene	Acenaph-thylene	Anthracene	Benzo (a,h,i) perylene	Fluoran-thene	Fluorene	Phenan-threne	Pyrene	Benzo (a) pyrene	Benzo (a) anthracene	Benzo (b) fluoran-thene	Benzo (k) fluoran-thene	Chrysene	Dibenz (a,h) anthracene	Indeno (1,2,3-c,d) pyrene
Location	Date	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)
MW-7A	11/06/2013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	3/31/2014	NS	1.0 U	1.0 U	1.0 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U
	6/6/2014	NS	1.0 U	1.0 U	1.0 U	0.05 U	0.04 U	0.04 U	0.07 U	0.03 U	0.05 U	0.01 U	0.07 U	0.07 U	0.02 U	0.01 U	0.04 U	0.06 U	0.04 U	0.02 U
MW-8A	11/05/2013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SPTW-02A	11/06/2013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SPTW-03B	11/05/2013	NS	1.0 U	1.0 U	1.0 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U
MW-A	11/05/2013	NS	1.0 U	1.0 U	1.0 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U
	11/15/2013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	3/31/2014	NS	1.0 U	1.0 U	1.0 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U
	6/6/2014	NS	1.0 U	1.0 U	1.0 U	0.05 U	0.04 U	0.07 U	0.05 U	0.03 U	0.03 U	0.03 U	0.05 U	0.02 U	0.02 U	0.01 U	0.02 U	0.05 U	0.02 U	0.01 U
MW-B	11/05/2013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	3/24/2014	NS	1.0 U	1.0 U	1.0 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U
	6/6/2014	NS	1.0 U	1.0 U	1.0 U	0.04 U	0.03 U	0.09 U	0.07 U	0.03 U	0.03 U	0.01 U	0.07 U	0.07 U	0.02 U	0.01 U	0.03 U	0.05 U	0.04 U	0.01 U
MW-E	11/05/2013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
MW-G	11/06/2013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
MW-J	11/06/2013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	3/26/2014	NS	1.0 U	1.0 U	1.0 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U
	6/6/2014	NS	1.0 U	1.0 U	1.0 U	0.02 U	0.04 U	0.07 U	0.05 U	0.01 U	0.03 U	0.01 U	0.05 U	0.02 U	0.02 U	0.01 U	0.02 U	0.05 U	0.02 U	0.01 U
PMW-04A	11/06/2013	NS	1.0 U	1.0 U	1.0 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U
PMW-05A	11/05/2013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
PMW-07A	3/26/2014	NS	1.0 U	1.0 U	1.0 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U
PMW-10A	11/05/2013	84.0 U	1.0 U	1.0 U	1.0 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U
PMW-16A	11/05/2013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
PMW-18A	11/06/2013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
PMW-21A	11/05/2013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
PZ-03B	11/06/2013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	11/15/2013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SDEMW-03	03/26/2014	NS	1.0 U	1.0 U	1.0 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U
	6/6/2014	NS	1.0 U	1.0 U	1.0 U	0.02 U	0.01 U	0.07 U	0.03 U	0.02 U	0.03 U	0.01 U	0.05 U	0.00 U	0.00 U	0.00 U	0.00 U	0.00 U	0.02 U	0.01 U
SDEMW-9	03/31/2014	NS	1.0 U	1.7 J	1.0 U	0.02 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U
	6/6/2014	NS	1.0 U	1.0 U	1.0 U	0.04 U	0.00 U	0.02 U	0.01 U	0.04 U	0.025 U	0.025 U	0.01 U	0.00 U	0.00 U	0.00 U	0.00 U	0.00 U	0.02 U	0.01 U
SDEMW-11A	03/31/2014	NS	1.0 U	1.0 U	1.0 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U
	6/6/2014	NS	1.0 U	1.0 U	1.0 U	0.02 U	0.01 U	0.01 U	0.00 U	0.04 U	0.02 U	0.03 U	0.00 U	0.00 U	0.00 U	0.00 U	0.02 U	0.04 U	0.00 U	0.01 U
SDEMW-13A	03/31/2014	NS	1.0 U	1.0 U	1.0 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U
	06/05/2014	NS	1.0 U	1.0 U	1.0 U	0.01 U	0.00 U	0.07 U	0.04 U	0.01 U	0.03 U	0.00 U	0.04 U	0.00 U	0.00 U	0.00 U	0.00 U	0.06 U	0.01 U	0.00 U
SDEMW-15A	03/26/2014	NS	1.0 U	1.0 U	1.0 U	0.076 J	0.025 U	0.027 J	0.025 U	0.027 J	0.28	0.24	0.038 J	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U
	06/06/2014	NS	1.0 U	1.0 U	1.0 U	0.03 U	0.02 U	0.08 U	0.03 U	0.03 U	0.04 U	0.00 U	0.00 U	0.00 U	0.01 U	0.00 U	0.00 U	0.00 U	0.00 U	0.00 U
RW11-CW3	3/31/2014	NS	1.0 U	1.0 U	1.0 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U
	06/06/2014	NS	1.0 U	1.0 U	1.0 U	0.04 U	0.00 U	0.00 U	0.00 U	0.04 U	0.00 U	0.02 U	0.00 U	0.00 U	0.00 U	0.02 U	0.01 U	0.07 U	0.00 U	0.00 U
PDEP-CW1	3/31/2014	NS	1.0 U	1.0 U	1.0 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U
	06/06/2014	NS	1.0 U	1.0 U	1.0 U	0.00 U	0.00 U	0.07 U	0.00 U	0.01 U	0.00 U	0.00 U	0.00 U	0.00 U	0.00 U	0.00 U	0.00 U	0.06 U	0.00 U	0.00 U
GCTLs		5000	14	28	28	20	210	2100	210	280	280	210	210	0.2**	0.05*	0.05*	1.5	15	0.005*	0.05*
NADCs		50000	140	280	280	200	2100	21000	2100	2800	2800	2100	2100	20	5	5	50	500	1.5	5

Notes:

NA = Not Available

NS = Not Sampled

GCTLs = Groundwater Cleanup Target Levels specified in Table I of Chapter 62-777, F.A.C.

NADCs = Natural Attenuation Default Source Concentrations specified in Table I of Chapter 62-777, F.A.C.

** = As provided in Chapter 62-550, F.A.C.

* = See the October 12, 2004 "Guidance for the Selection of Analytical Methods and for the Evaluation of Practical Quantitation Limits" to determine how to evaluate data when the GCTL is lower than the PQL.

Exceeds GCTL Limit

Exceeds NADC Limit

Appendix G: Screening-Level Indoor Air Risk Evaluation

Table G-1: Screening-Level Indoor Air Risk Evaluation of the 2011 Indoor Air Data Collected on February 15, 2011

Contaminant	Building 164			Building 261		
		Industrial			Industrial	
	Site Indoor Air Concentration ($\mu g/m^3$)	Vapor Intrusion Cancer Risk	Vapor Intrusion Hazard Quotient	Site Indoor Air Concentration ($\mu g/m^3$)	Vapor Intrusion Cancer Risk	Vapor Intrusion Hazard Quotient
Acetone	1.20E+02	--	8.8E-04	4.10E+01	--	3.02E-04
Benzene	5.00E+00	3.2E-06	3.8E-02	4.20E+00	2.67E-06	3.20E-02
Bromomethane	BDL	--	BDL	6.20E-01	--	2.83E-02
Carbon Disulfide	3.10E-01	--	1.0E-04	2.70E-01	--	8.81E-05
Carbon Tetrachloride	5.60E-01	2.7E-07	1.3E-03	5.10E-01	2.50E-07	1.16E-03
Chloroform	7.30E-01	1.4E-06	1.7E-03	6.20E-01	1.16E-06	1.44E-03
Chloromethane	1.50E+00	--	3.8E-03	1.50E+00	--	3.81E-03
Cyclohexane	1.80E+01	--	6.8E-04	7.00E+00	--	2.66E-04
Dichlorobenzene, 1,2-	4.40E+00	--	5.0E-03	9.40E-01	--	1.07E-03
Dichlorobenzene, 1,4-	8.40E-01	7.5E-07	2.4E-04	2.30E-01	2.06E-07	6.56E-05
Dichlorodifluoromethane	2.70E+00	--	6.2E-03	2.70E+00	--	6.16E-03
Dioxane, 1,4-	1.20E+00	4.9E-07	9.1E-03	9.40E-01	3.83E-07	7.15E-03
Ethyl Acetate	3.90E+00	--	1.3E-02	8.10E+00	--	2.64E-02
Ethyl Chloride (Chloroethane)	3.80E+00	--	8.7E-05	3.80E+00	--	8.68E-05
Ethylbenzene	9.50E+00	1.9E-06	2.2E-03	7.30E+00	1.49E-06	1.67E-03
Hexane, N-	1.10E+01	--	3.6E-03	8.60E+00	--	2.80E-03
Isopropanol	1.20E+01	--	1.4E-02	1.20E+01	--	1.37E-02
Methyl Ethyl Ketone	5.20E+00	--	2.4E-04	2.20E+01	--	1.00E-03
Methyl Isobutyl Ketone	5.40E+00	--	4.1E-04	1.80E+00	--	1.37E-04
Methylene Chloride	1.30E+00	1.1E-09	4.9E-04	1.90E+00	1.55E-09	7.23E-04
Tetrachloroethylene	1.10E+00	2.3E-08	6.3E-03	2.50E+00	5.30E-08	1.43E-02
Tetrahydrofuran	BDL	--	BDL	8.10E-01	--	9.25E-05
Toluene	1.60E+02	--	7.3E-03	2.00E+02	--	9.13E-03
Trichloro-1,2,2-trifluoroethane, 1,1,2-	5.80E-01	--	4.4E-06	5.70E-01	--	4.34E-06
Trichloroethylene	2.30E+00	7.7E-07	2.6E-01	3.40E-01	1.14E-07	3.88E-02
Trichlorofluoromethane	1.80E+00	--	5.9E-04	1.30E+00	--	4.24E-04
Trimethylbenzene, 1,2,4-	3.40E+01	--	**1.1E+00**	1.70E+01	--	5.54E-01
Vinyl Acetate	2.00E-01	--	2.3E-04	2.00E-01	--	2.28E-04
Xylenes	3.30E+01	--	7.5E-02	2.80E+01	--	6.39E-02

-- toxicity value not avaialble to quantify cancer risk or noncancer Hazard Quotient.
Bold – Hazard Quotient exceeds 1.0.
BDL = Below Detection Limit
$\mu g/m^3$=micrograms per cubic meter