Petroleum Products Corporation

3130 Southwest 17th Street
Pembroke Park, Florida
County: Broward
District: Southeast
Site Lead: EPA
Placed on National Priorities List: July 22, 1987
HWC # 023
ERIC ID # 3796

Site Description and History

The Petroleum Products Corporation (PPC) site, located in Township 51S, Range 42E, Section 20 at 25° 59′ 35.6294″ N, 80° 10′ 10.4587″ W, was operated from 1953 to the 1970's under various company names as a broker and processor of used petroleum and other hydrocarbon products. It is suspected from earlier sample analyses that other materials, such as solvents, were handled at the site. The sulfuric acid/clay process was used at the site to re-refine used motor oil.

PPC operated from approximately 1958 to 1971 as a processor and broker of waste oil and other hydrocarbon products. Sludges generated by the re-refining process were disposed of in unlined pits that covered approximately a 2-acre area. Between 1970 and 1971, PPC sold most of its property, covered the pits, and reportedly spread contaminated fill across the southern half of the site, extending the contamination to an approximate total of 7 acres. After 1971, PPC operations were restricted to the southeast corner of the site, which reportedly functioned only as a storage/distribution facility until complete de-activation in 1985. During this period, the remainder of the original PPC property was developed as a commercial/industrial warehouse complex. Several of the warehouses were constructed over the abandoned sludge disposal pits.

Threat

As a result of inadequate plant practices, large amounts of petroleum hydrocarbons, acid, polychlorinated biphenyls (PCBs), and heavy metals, including chromium and lead, have contaminated the soil and ground water. Oil product periodically seeps to the land surface through well vaults or cracks in the asphalt or warehouse building foundations where there is the potential for direct contact by the public. These materials have spread to adjacent properties as dissolved components in ground water.

The Hallandale municipal wells are located approximately one-half mile east of the PPC site, and the one-foot drawdown contour line established by the Broward well field Protection Program is within 500 feet of the site. The Hollywood well field is less than 2 miles away, and the PPC site lies within its one-foot drawdown line. A third proposed well field for Broward County will be located approximately 7,500 feet west of the site. Several private wells are located closer than one-half mile from the site. The site is located within a designated “Delineated Area” as defined by Chapter 62-524, which requires that potable wells proposed for construction in the area be designed to avoid exposure to contaminated groundwater or exacerbation of contamination.

Response Strategy and Status (December 2016)

In March 1984, the present owner's consultant installed six shallow monitoring wells around the site. A hydrocarbon layer up to 20 inches thick was found under the site. Analysis of this layer revealed high levels of metals, petroleum hydrocarbons, and volatile organic compounds.

The Department of Environmental Regulation (FDER, now DEP) and the Broward County Environmental Quality Control Board have pursued enforcement actions against the PPC site's responsible parties since 1979. In March 1985, the EPA issued an administrative order requiring the owner to perform certain cleanup measures at the site, including disposal and removal of all tanks from the site. All remaining on-site buildings were demolished and removed, and the site was graded and covered with clean fill.

In March 1985, the FDER contractor, O.H. Materials, constructed an oil recovery system at the site. By December 1990, the system had recovered approximately 7,000 gallons of oil, yet over two feet of oil was still present in some on-site monitor wells. It was estimated that approximately 20,000 – 60,000 gallons of oil are floating on the water table. In January 1991, FDER discontinued operation of the free product recovery system due to persistent malfunctions & minimal oil recovery.

In 1986, the FDER contractor, Ecology and Environment, Inc., initiated a Remedial Investigation/ Feasibility Study (RI/FS) to determine the extent of contamination and to investigate remedial alternatives. In March 1988, a final RI/FS was submitted by the FDER contractor. In April 1988, the EPA and FDER agreed that additional treatability tests should be conducted before selecting a remedy for soils. In March 1990, EPA provided FDER with the funds for a soil washing treatability study. This study was completed in June 1991.

In July 1990, the State of Florida Administrative Hearing Officer determined that the PPC site was eligible for reimbursement of cleanup costs from the State Early Detection Incentive Program. In October 1990, the lead management role was transferred to EPA.

A three-phased approach to site remediation has been undertaken: Operable Unit (OU) 1 addressing free product recovery and containment of the groundwater plume; OU 2 addressing remediation of contaminated soils; and OU 3 addressing remediation of contaminated groundwater.

In August 1991, the EPA conducted a Public Meeting to propose the OU 1 remedy. In October 1991, the EPA signed a Record of Decision (ROD) for OU 1. The State concurred only with the recommended enhancement of free product recovery. In October 1991, the PRP contractor, Blasland, Bouck & Lee (BB&L), began development of the OU 1 Work Plan. In December 1991, the PRPs submitted the work plan to the EPA and FDER for review. Review comments were submitted to the PRPs in January 1992, and a revised work plan was submitted and approved in February 1992. In April 1992, the PRPs and EPA entered into a Consent Decree for OU 1. Also in April, the Department of Transportation closed out all subsurface drainage wells on the site. In June 1992, BB&L completed fieldwork activities to evaluate locations for the free product

recovery wells. In September 1992, BB&L submitted a 30% Remedial Design (RD) to the EPA and FDER for review. The RD proposed a combination of OU 1 and OU 3 for an active pump and treat/free product recovery system. In May 1993, a final design was submitted to FDER for review.

In October 1991, the EPA tasked Bechtel to conduct a Supplemental Remedial Investigation. In March 1992, Bechtel submitted both the Baseline Risk Assessment and the Supplemental Feasibility Study (FS) to the EPA. In April 1992, review comments for the Risk Assessment were submitted to Bechtel. In June 1992, a revised Risk Assessment was submitted to the EPA and FDER. The Supplemental Feasibility Study was finalized in July 1992. In June 1992, the EPA submitted a Proposed Plan for OU 2 to FDER for concurrence. The plan proposed soil washing and stabilization as the selected remedial alternative for contaminated soils at the site. In July 1992, the EPA submitted a revised plan, which proposed solidification/stabilization as the selected remedial alternative. The State did not concur with the EPA Proposed Plan.

Final design for OU1 was submitted and approved by the DEP in July 1993. The construction contract for OU1 was awarded to BB&L in October 1993. BB&L began construction of the free product recovery system in November 1993, and completed construction in June 1994. The groundwater and free product recovery system went on-line in July 1994.

An elevated groundwater table due to a high volume of rainfall rendered the infiltration gallery inoperative, resulting in a shutdown of the treatment system for an eight-month period. In July 1995, the DEP approved a design for replacing the infiltration gallery with an underground injection well for effluent disposal. The injection well was installed in July 1995. Free product recovery was at a minimum between July 1995 and April 1996. In April 1996, the free product recovery rate significantly increased with the incorporation of the 24-inch DEP well to the recovery system.

In November 1995, the minimal effectiveness of the OU 1 remedy in addressing ongoing sources of contamination was recognized. It was decided to proceed with the proposed selected remedial alternative for OU 2. The proposed OU 2 remedial action was reviewed by the National Remedy Review Board (NRRB) in May 1996. The NRRB agreed with the proposed remedy provided it was guaranteed to be at least 75% effective in treating contaminated soils. EPA and DEP reviewed the site data along with the improvements to OU 1 and agreed to proceed with the proposed remedy.

In July 1996, during an operation and maintenance oversight visit, product was discovered seeping out of the ground near RW-10 and possibly RW-8. The staining near RW-8 initially appeared to be the result of a spill unrelated to the site. Both areas are being monitored. The plan of action is to correct the situation at RW-10 as part of the OU 2 remedy. Future spills, or product seeping from the ground near RW-8, will be handled on an individual basis.

In November 1996, EPA prepared the draft proposed plan for OU 2 identifying in situ solidification/stabilization of approximately 131,200 cubic yards of contaminated soil as the preferred alternative. DEP provided verbal concurrence with the proposed plan. A Public Meeting was conducted in February 1997. The public comment period for the proposed plan was extended

to April 9, 1997. The draft ROD for OU 2 was submitted to the DEP in July 1997, for review. EPA did not issue a ROD for OU2.

A remedial action plan (RAP) modification was prepared and approved by DEP and EPA to enhance free product recovery operations while the proposed OU 2 remedy was being evaluated. The RAP modification was for installation of additional wells to fill data gaps regarding product and water table levels. All additional wells were installed in June 1997. EPA initiated groundwater sampling of 24 specific monitor wells on a quarterly basis in order to provide new data regarding plume migration.

A BioSlurp pilot test was conducted by Battelle Corporation in July 1997. Results from the pilot test indicated that this technology could provide an increase in system efficiency over the current free product recovery system, and increase natural attenuation of certain contaminants. The bioslurping system was proposed as an enhancement to OU 1.

A Geoprobe investigation was performed in February 1998, to gather data to help determine the boundaries of the contaminant plume and to design the full scale bioslurp system. The bioslurping system design (RAP) by Battelle was submitted to DEP and EPA in August 1998. The EPA and DEP agreed that the bioslurp system would be constructed in phases in order to evaluate the efficiency of the innovative technology. Phase I installation would cover the southern part of the site known as Zone 1. Installation of the bioslurp wells was conducted in December 1998, and the existing groundwater and free product recovery system was shut down to upgrade and accommodate the new bioslurp construction specifications.

Installation of the Phase I bioslurp system was completed in March 1999, and included 44 new recovery wells. A final inspection was conducted by the EPA and DEP in May 1999. Parts of the older OU 1 system were integrated into the operational bioslurp system. An 18,000-gallon water-holding was incorporated into the bioslurp design to address oil emulsification in the extracted groundwater produced during product recovery. During the first six weeks of operation, the bioslurp unit collected 776 gallons of oil from Zone 1.

The bioslurp system was shut down in April 2000, due to extensive oil emulsification in the extracted groundwater that blocked the carbon polishing system. Chemical treatment of the extracted groundwater was selected as the treatment technology for the emulsified oil. The system was installed in September 2000, improving system performance. DEP and EPA agreed that Phase II of the bioslurp system would be initiated to include oil recovery from Zone 2 of the site.

Results of quarterly groundwater sampling conducted by EPA in August 1999 indicated that there was no offsite groundwater contamination. Soil samples were also taken at six locations in the residential trailer park area south of the site. Upon evaluation of the analytical data, both EPA and DEP agreed that additional soil assessment should be conducted at the trailer park. This soil assessment was completed by DEP in March 2001, and additional delineation was completed by the PRPs in August 2002. The sampling results indicated a small area of contamination located on the trailer park property, and on the southern right-of-way of Carolina Street. In July 2003, approximately 250 tons of contaminated soils were excavated from the right-of-way along

Carolina Street to allow installation of a storm water run-off pipe system. The Town of Pembroke Park completed installation of the above ground storm water collection pipe in the right-of-way area adjacent to the site in September 2003.

Phase II of the OU 1 remedial action was initiated in August 2001. Construction of the Phase II bioslurp system expanded the area of oil recovery with installation of 67 additional recovery wells west and north of the Phase I bioslurp system. One vacuum pump is being used for the entire bioslurp system. DEP and EPA reviewed all treatment system data in July 2002, and agreed that the system was performing with improved efficiency and capture of free product. During 2003 (January-November), the bioslurp system averaged 200 to 300 gallons of recovered product per month.

Groundwater sampling in May 2003, at specific monitor wells located on- and offsite, indicated no groundwater contamination outside of site boundaries, and minimal groundwater contamination located near the center of the site. Twenty-one monitor wells were abandoned in February 2004. This work was approved by both DEP and EPA in order to remove redundant monitor well information and mitigate potential conduits for contaminant migration. An annual groundwater evaluation was conducted in June 2005, and the data indicated one offsite monitoring well had low levels of total recoverable petroleum contamination. The average monthly free product removal from January to October 2005 was approximately 149 gallons/month.

The EPA completed the Second Five Year Review (FYR) for the Superfund site in December 2005. Recommendations in the FYR included addressing the following: (1) contaminated soil at the Bamboo Mobile Home Park located south of the site; (2) product seepage; (3) efficiency of the bioslurp operation and; (4) quarterly submittal of status reports. In August 2006, DEP met with the EPA and PRPs regarding the status of the site. The EPA indicated that the Agency would evaluate implementing additional, long-term institutional controls for the site, and continue to evaluate the OU 2 (soils) remedial alternative. From June 2006 to March 2007, a total of 1,492 gallons of product was recovered.

The bioslurp system recovered 1,600 gallons of free product in 2007, and an additional 560 gallons in the first quarter of 2008. For 2008, the bioslurp system recovered a total of 2,056 gallons of free product and emulsified hydrocarbons from 3.24 million gallons of recovered groundwater. In March 2009, 400 gallons of free product were manually removed from Warehouse Bay 261 using a “snare”. Manual cleanout of oil in the pit was recommended by DEP in the future to cost effectively address accumulated product in Bay 261.

On October 27-28, 2008, Petroleum Products reported a 10,000-gallon treated groundwater spill to DEP’s State Warning Point and EPA. The spill occurred due to equipment malfunction. A written report was submitted to DEP on October 31, detailing the events that occurred.

In December 2008, the Petroleum Products PRPs submitted an “Evaluation of In-situ Thermal Treatment Technology” report to DEP for review. The remedial alternatives evaluation looked at three types of thermal technologies to enhance oil recovery and determined that thermal conductive heating was most feasible at the site. In April 2009, a site visit meeting was held with the EPA,

PRPs and DEP to discuss the current status of the site and alternative remedial methods. EPA requested that the PRPs submit possible remedies to enhance cleanup of the site. An Oil Viscosity Study was completed in June 2009 to determine the viability of implementing the thermal conductive heating technology and what temperature would be necessary to enhance the flow of oil for recovery by the bioslurp system. A bench scale study predicted that a subsurface temperature of at least 130 degrees F would be required, while the vendor performing the study recommended an oil temperature as high as 160 degrees F to reliably recover the oil. A pilot test would be necessary to determine actual required temperatures and address concerns of potential damage to existing PVC wells and piping.

In 2009 an interagency agreement was signed between EPA and the US Army Corp of Engineers (USACE) for completion of a remedial investigation/feasibility study. USACE was tasked with review of historical site data and to identify data gaps or inconsistencies. Between 2009 and 2012, USACE conducted additional assessment at the site in a phased approach to identify the horizontal and vertical extent of the sludge pits and contaminated soils, and the nature and extent of groundwater contamination and free product. Sampling of existing groundwater monitoring wells was completed in October 2009. Assessment included the installation and sampling of 136 soil borings and 37 new monitoring wells. Annual groundwater monitoring was completed by USACE in 2010, 2011, 2012 and 2013.

EPA completed the Third Five Year Review in December 2010. Recommendations in the FYR included: 1) determine need for interim institutional controls to limit land or groundwater use; 2) assess options for improving efficiency of the bioslurp system and set goals that can be used to assess system performance; 3) determine if vapor intrusion study is needed.

In February 2011, petroleum-contaminated soil was removed to a depth of 4 to 4.5 feet from the Cotter Property in the mobile home park south of the site. Clean backfill was used to restore the property to original grade. Excavation did not include soils under the mobile home on the Cotter Property.

Operation of the bioslurp system was terminated in October 2012, due to the reduced efficiency and diminishing rates of product recovery by the system. At that time, an estimated 30,695 gallons of free product and 3715 gallons of emulsified oil is reported to have been recovered by the bioslurp system since startup. Since system shut down, periodic monitoring of free product thicknesses and static groundwater levels is being conducted along with inspections for surface seepages. Sludge and recovered free product remaining in the system tanks will be removed and disposed at a permitted facility in Deer Park, Texas. Due to product seepage through a crack in the concrete in front of Bay 261, a seepage vault was constructed in 2013 to capture seepage and facilitate its removal. In September 2013, USACE contacted DEP to report that oil was observed seeping from well vaults at the surface near warehouse units 442 and 545 so that appropriate action could be taken.

In 2013, EPA submitted a draft Human Health Risk Assessment (HHRA) for review. A draft Remedial Investigation (RI) report for OU 2 (soils) was submitted in March 2014, documenting the results of the USACE assessment work. A revised Supplemental Risk Assessment was also

submitted in March 2014. DEP provided review comments on both documents in May 2014. Additional delineation is recommended. The RI did not address potential site related contamination on the adjacent Kelsey property. Responses to comments and the final OU 2 RI including the final Supplemental HHRA report from the EPA and USACE was submitted in January 2016.

EPA issued a Five-Year Review in 2015. The report concluded that with ongoing inspections and mitigation of oil seeps to prevent direct contact, the interim remedy was protective in the short term. Selection and implementation of a permanent soil, source and groundwater remedy is required to ensure long term protection of public health and the environment at the site.

Schedule

Development of a Feasibility Study is ongoing and will be used to support the EPA's selection of an OU1/OU2 site remedy. A Technical Memorandum was submitted by the USACE in December 2015 which provided an initial screening of potential technologies to address the existing source and soil contamination at the site. The EPA, DEP and the responsible parties provided feedback on the draft document. A draft final Technical Memorandum was provided in April 2016. A draft OU1/OU2 Feasibility Study (FS) report was submitted in August 2016. Based on review by EPA, DEP and the responsible parties, it was determined that treatability testing is needed to confirm the effectiveness of several technologies being considered, prior to remedy selection. The USACE is developing a Treatability Study Work Plan and Data Gaps Work Plan so that the necessary data may be collected to finalize the FS.

The EPA anticipates a revised FS will be submitted in September 2017 with a Record of Decision documenting the EPA selected remedy projected for mid-2018.

Periodic groundwater monitoring is conducted to monitor the stability of the groundwater contaminant plume. Regularly scheduled site inspections continue in order to ensure that any surface seepages of free product are identified and addressed in the interim until a final site remedy can be implemented.