UNITED STATES

ENVIRONMENTAL PROTECTION AGENCY

REGION III

# STATEMENT OF BASIS

**Former Quaker State/Ergon Refinery Facility**

**Newell, West Virginia**

EPA ID: WVD057634776

Prepared by

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## I. Introduction

The United States Environmental Protection Agency (EPA) prepared this Statement of Basis (SB) to solicit public comment on its proposed remedy for the facility now known as Ergon West Virginia, Inc., Newell Refinery (Ergon) (Facility), located near the town of Newell, West Virginia. The Facility was previously built, owned and operated by Quaker State Corporation (Quaker State) and was named Congo Refinery. Ergon West Virginia Inc. (EWVI) currently owns and operates the Facility as an active refinery.

EPA's proposed remedy for this Facility includes: (1) establishing Technical Impracticability (TI) Zones for two areas of contaminated groundwater; (2) long-term monitoring of groundwater to document plume stability and natural attenuation of contaminated groundwater; and (3) implementing use controls that will limit land and groundwater use.

The Facility is subject to EPA's Corrective Action (CA) Program under the Solid Waste Disposal Act, as amended, commonly referred to as the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. § 6901 et seq. The CA Program requires that owners/operators of facilities subject to certain provisions of RCRA investigate and address releases of hazardous waste and hazardous constituents that have occurred on or from their properties. Although West Virginia is authorized for implementation of the CA Program under Section 3006 of RCRA, EPA is the lead for this Facility under the Unilateral Administrative Order issued to Quaker State in February 1994 (1994 UAO).

This SB summarizes the information submitted to EPA in work plans and reports by Pennzoil/Quaker State and Shell Oil Products US (SOPUS Products) pursuant to the 1994 UAO. This SB presents EPA's basis or rationale for selecting the proposed remedy and includes the Administrative Record (AR) for the Facility, which is composed of all documents, including data and quality assurance information that EPA relied on in proposing the final remedy. Public participation information is provided in Section IX of this SB for those interested in reviewing the AR. Information on the Corrective Action Program as well as a fact sheet for the Facility can be found at https://www.epa.gov/hwcorrectiveactionsites/hazardous-waste-cleanup-shell-lubricants-formerly-penzoil-quaker-state.

EPA is providing a thirty (30)-day public comment period on this SB. EPA may modify its proposed remedy based on comments received during this period. EPA will announce its selection of a Final Remedy for the Facility in a Final Decision and Response to Comments (FDRTC) after the public comment period has ended.

## II. Facility Background

### A. Site History

The Facility was previously owned by Quaker State and was called the Congo Refinery. EPA issued a Unilateral Administrative Order to Quaker State, Congo Plant under RCRA Section 3008(h) in February 1994. In July 1997, EWVI purchased the Facility from Quaker State and operates it at this time. In 1999 Pennzoil and Quaker State merged, forming Pennzoil-Quaker State Company (PQS). In 2002, SOPUS Products acquired PQS and began doing business as SOPUS Products in 2003. SOPUS Products continues to implement the requirements of the 1994 UAO.

The Facility is comprised of 70 acres, located on the southern bank of the Ohio River, near the town of Newell in Hancock County, WV (Figure 1). The Refinery was constructed on the Facility between 1970 to 1972 and refining began in April 1972. The Facility's primary functions are crude oil refining and storage and distribution of petroleum products. Processes include:

- Storage of crude oil and petroleum products in above ground tanks;
- Crude oil desalting and then distillation to create multiple fractionations or products;
- Reformulation of gasoline from low-octane into high-octane gasoline;
- Extraction of propane from vacuum tower bottoms;
- Hydrotreating of lube oil stocks;
- Wax removal from lube oil stocks; and
- Blending additives with gasoline to meet quality specifications.

Raw materials include crude oil and additives for lube oil and gasoline. Crude oil is delivered to the Facility in bulk by Ohio River barges. A small amount of crude is delivered by truck and additives are delivered by truck or rail. The eastern portion of the Facility is leased and operated by SOPUS Products, which blends, packages and ships lubricating oil and other products.

Facility buildings include buildings for petroleum product processing and storage, administration/staff and a laboratory and machine shop. There are many aboveground storage tanks for product storage. A large building on the SOPUS Products leased property is used for administration, packaging, blending and storage of oil products.

The Facility is bordered by the Ohio River to the north/northwest and State Route 2 and railroad tracks to the south. Industrial properties are on the eastern border, along State Route 2, and include SH Bell Company and DE Minerals Processing, Inc. Two residences are located approximately 200 feet from the Facility's eastern boundary.

### B. Physiographic Setting

The Facility is located in the unconsolidated alluvial sediments of the Ohio River bottom lands. The surficial portion of these deposits are referred to as glacial outwash. The glacial outwash deposits overlie sedimentary bedrock, which occurs at depths ranging from less than 35 ft to at least 75 ft below ground surface. Bedrock consists of massive sandstones, siltstones and shale. The overlying outwash deposits provide the matrix for the most prolific aquifer in the Ohio River Valley called the outwash aquifer. Under natural conditions the outwash aquifer is recharged by precipitation and groundwater that discharges from the upgradient bedrock systems. Under pumping conditions, substantial amounts of water are drawn into the glacial outwash aquifer from the Ohio River. This aquifer is highly permeable and is capable of sustaining substantial ongoing groundwater withdrawal.

Elevation across the Facility averages approximately 681 to 682 feet (ft) above mean sea level (amsl) and is essentially flat. South of the Facility is the Ohio River Valley wall, a steep rock cliff with an elevation of approximately 300 ft above the Facility (980 ft amsl).

The Facility's shallow unconsolidated aquifer is approximately 8 to 26 ft below ground surface (fbgs). Facility groundwater is shallowest at the southern corner and deepest at its northern corner. The aquifer is recharged by precipitation, upward flow from underlying bedrock and inflow from the Ohio River. The Ohio River is dammed approximately 5 miles downstream from the Facility to maintain a water elevation high enough to support commercial barge traffic. River water is commonly at a slightly higher elevation than the Facility's shallow aquifer. This means that the shallow aquifer is substantially recharged from River inflow also when the Facility's high-volume groundwater pumping wells induced inflow from the River.

The water table is flat throughout most of the Facility, with an average horizontal gradient of 0.0003 feet per foot according to 2019 groundwater monitoring data. Generally, groundwater flows from the central part of the Facility to the west. High volume groundwater production wells in the Facility's northern corner create a northern gradient in this area. In the north central part of the Facility, groundwater movement is commonly from the River towards the Facility, based on river water elevation compared to groundwater elevations. These conditions indicate inflow of River water, which creates a hydraulic boundary that prevents Facility groundwater from discharging to the River. The groundwater gradient is reversed in this area when River levels are occasionally lower than water table levels.

There are five on-site groundwater production wells (NW-1 to NW-5) that produce water for non-potable industrial uses. The wells extract groundwater from the lower part of the unconsolidated aquifer from 50 to 70 fbgs depths (approximate). Figures 2 and 3 show the production well locations. NW-3, -4 and -5 are the most commonly used production wells. The production wells yield 300 to over 400 gallons per minute (gpm). Short-term yield tests indicate specific capacity values between 28 and 56 gpm per foot of drawdown. Pumping rates range from 100 to 350 gpm. During pumping, a horizontal cone of depression has an interpreted radius of approximately 100 to 150 feet around wells NW-3 and NW-4 in the northeast corner of the Refinery. In the northwestern corner, a cone of depression with an interpreted horizontal radius of approximately 150 feet is created by NW-5, and a cone of depression with an interpreted horizontal radius of less than 100 feet is created around well NW-1.

### C. Environmental History and Assessment Overview

In 1987, EPA performed a Site Inspection. In 1988, a Visual Site Inspection of the Refinery was performed by Versar, Inc. who prepared a RCRA Facility Assessment (RFA) Report for EPA. The RFA identified 19 Solid Waste Management Units (SWMUs) and four potential Areas of Concern (AOCs).

Although SWMUs and AOC were identified in the RFA Report, not all units were recommended for further investigation. Nine SWMUs were recommended for No Further Action (NFA). Based on the RFA Report, SOPUS Products submitted NFA requests to EPA for SWMUs 2, 3, 5 and 13-18. EPA approved the NFA requests because there was no evidence of releases. Two AOCs did not require sampling or were regulated under another program. The remaining 10 SWMUs and 2 AOCs were investigated as part of the RCRA Facility Investigation (RFI). Soil and groundwater were sampled for site related contaminants for the RFI. In addition, in 2000, PQS began performing interim remedial measures and groundwater monitoring which provided data for further evaluation of site-wide groundwater including areas of floating free-phase hydrocarbons in groundwater, called separate phase liquid (SPL).

In June 2009, SOPUS Products submitted a draft RFI Report to EPA. EPA approved the RFI Report in May 2019. The 2009 RFI Report identified low level petroleum volatile organic compounds (VOCs) and polycyclic aromatic hydrocarbons (PAHs) in soils in some Facility areas. The VOCs and PAHs found are constituents consistently associated with crude oil and refining processes. The RFI Report included a human health risk assessment (HHRA) to determine whether VOCs and PAHs identified in soil at SWMUs and AOCs warranted further investigation or action. The HHRA also assessed site-wide groundwater conditions including groundwater beneath SWMUs and AOCs and vapor intrusion (VI) data.

## III. Summary of Environmental Investigations and Interim Measures

### A. Soil

Table 1, below, lists the 10 SWMUs and 2 AOCs recommended for investigation. Soil results were screened using EPA Regional Screening Levels (RSLs) for industrial settings. Constituents that exceeded EPA's screening levels for industrial soil are identified as contaminants of potential concern (COPCs). The areas with COPCs are then evaluated in the HHRA (see Section III.D).

**Table 1. Soil Screening Results**

| SWMU/AOC | COPCs |
|---|---|
| SWMU 1: Plant Boilers | benzo(a)pyrene, iron, manganese |
| SWMU 4: Satellite Storage Area | Iron (Fe), manganese (Mn) |
| SWMU 6: Old Heat Exchanger Cleaning Pads | 1 of 34 samples exceeded the Mn screening level. |
| SWMU 7: Tank Bottoms Disposal Areas 4 & 6 | Fe, Mn |
| SWMU 8: New Heat Exchanger Cleaning Pad & Drum Cleaning Area | PAHs, Fe, Mn |
| SWMU 9: Old Drum Storage Area | Fe, Mn, mercury |
| SWMUs 10,11,12: Wastewater Treatment Area | PAHs, Fe, Mn, chromium |
| SWMU 19: Oily Wastewater Sewer System Treatment Area | PAHs, Fe, Mn, lead |
| AOC 1: Tank Areas 1, 2, 5, 7, 7A | No exceedances |
| AOC 1: Tank Area 3 | PAHs in shallow soil only |
| AOC 1: Tank Areas 4 & 6 | BTEX, naphthalene |
| AOC 1: Tank Area 8 & Lube Blending Area | Fe, Mn |
| AOC 2: Process Pipeways & MEK Area | Process Pipeways: PAHs;<br>MEK Area: toluene, Mn |

Some metals were found in soil at levels greater than EPA's industrial screening levels at various locations at the Facility and include: arsenic, chromium, lead, iron, and manganese. However, arsenic, iron, and manganese were found in Facility soils at levels that indicate natural conditions or background, although exceeding screening levels. Arsenic was detected in every soil sample, where analyzed, at levels exceeding the screening value. The arsenic levels reflect natural site-wide soil conditions because of its ubiquity in shallow and deeper soil. Also, arsenic is not currently used, or historically used in the Facility refining processes. EPA concluded that arsenic is not a site-related COC in soil.

### B. Groundwater

Groundwater sampling was conducted in multiple phases during the RFI because COCs detected during initial sampling required more investigation to define the plumes. Groundwater sample results were screened using federal maximum contaminant levels (MCLs) promulgated pursuant to 42 U.S.C. § 300f et seq. of the Safe Drinking Water Act and codified at 40 CFR Part 141 or were screened using EPA RSLs for constituents with no MCL.

Site-wide groundwater COCs are benzene, toluene, ethylbenzene, and xylene (BTEX), methyl tertiary-butyl ether (MTBE) and methyl-ethyl ketone (MEK or 2-butanone). During the RFI, benzene levels exceeding the MCL of 5 micrograms per liter (ug/l) were detected in two areas in the northern half of the Facility. MTBE was the next most prevalent COC, with RSL exceedances in five wells located in two discrete areas north of the MEK dewaxing area.

Arsenic was the most common groundwater metal detected above the MCL. Dissolved arsenic levels were historically found at 0.75 μg/l to 235 μg/l. Arsenic is naturally occurring in Facility soils and groundwater; however, in specific areas its presence at elevated levels is likely caused by reduced oxygen (anaerobic) groundwater conditions. Anaerobic conditions are created when naturally-occurring anaerobic bacteria biochemically degrade petroleum hydrocarbons in groundwater. Elevated dissolved arsenic levels are localized to the anaerobic footprints induced by the bacterial degradation of petroleum COCs.

Dissolved COCs were correlated to historical release locations and to areas where COCs migrated from release locations. Significantly, since the groundwater gradient beneath the majority of the Facility is flat, movement of dissolved COCs has been minimal and remains contained within Facility boundaries. To investigate whether COCs were discharging to the Ohio River or surrounding properties, monitoring wells were installed along the Facility's 2,400-ft boundary along the Ohio River and along the Facility's southwestern and northeastern boundaries. Sampling showed that COCs in groundwater were only found in the central part of the Facility with no evidence of off-site migration. Sampling data also show that current areas of dissolved phase constituents are significantly smaller than when monitored from 2004 to 2006 during the RFI.

Groundwater monitoring reports (2015-2019) show that COCs levels have been declining in the 22 monitoring wells used to characterize the dissolved contaminant plumes. According to 2019 data (summarized in Table 2), VOC exceedances are currently found at MW-38R (toluene and MEK). Dissolved arsenic, which is not a COC, exceeds the MCL in eight of the 22 monitoring wells. Figures 2 and 3 show SPL areas in 2013 and 2019, respectively. There are three main areas of SPL and seven small SPL areas limited to one well, where isolated SPL occurrences have been observed. The presence and thickness of SPL in most wells in the main areas and at other locations have been either generally stable or declining during the past several years.

| **Table 2.<br>Summary of COC Detections in Groundwater Samples (2019)** | | | | |
|---|---|---|---|---|
| **Analyte** | **Detections** | **Detection Range** (ug/l) | **MCL/RSL** (ug/l) | **Number of Exceedances & MW ID** |
| Benzene | 0 of 22 | None | 5 MCL | None |
| Toluene | 3 of 22 | 28 – 90,000 | 1,000 MCL | 1: MW-38R |
| Ethylbenzene | 0 of 22 | None | 700 MCL | None |
| Total Xylenes | 0 of 22 | None | 10,000 MCL | None |
| MEK | 1 of 4 | 28,600 | 560 RSL | 1: MW-38R |
| MTBE | 0 of 22 | None | 14 RSL | None |
| Arsenic, dissolved | 15 of 22 | 1.93 – 57.4 | 10 MCL | 8: MWs-29, 38R, -42, -43, SCAV-13, -16, -17, -20 |

The groundwater plumes with COC exceeding MCLs/RSLs are located far from the Facility's groundwater production wells (NW-1 to NW-5) (Figures 2 and 3). Groundwater plumes with VOC exceedances are located 1,000 ft away from production wells and groundwater plumes with arsenic exceedances are 600 ft away from production wells. The main pumping wells are NW-3, -4 and -5, and COCs were not found in samples collected from several monitoring wells in the vicinity of these production wells, indicating that COCs are not being drawn to the NW wells.

Natural attenuation parameters (pH, redox, dissolved oxygen, total and dissolved iron, sulfate, nitrate/nitrite, alkalinity) were collected from monitoring wells during 2015 to 2019 monitoring events. The data was evaluated for indications of biochemical degradation of COCs in the dissolved plumes. This evaluation of COC concentration trends over time provides evidence that COC plumes are shrinking through biochemical degradation.

In summary, data show that dissolved COCs in groundwater are not migrating off-site, nor discharging to the Ohio River, based on the RFI and recent data collected from newer monitoring wells installed near the Facility property boundaries. Groundwater plumes of dissolved COCs are located in the center of the Facility, are stationary and are shrinking through biochemical degradation. Also, groundwater production wells (located adjacent the Ohio River) are not drawing COCs toward them.

### C. Interim Remedial Measures for Groundwater

An interim remedial measure (IM) was implemented to address an ongoing source of groundwater contamination at the Facility, i.e., floating hydrocarbons or separate-phase liquid (SPL). SPL at the Facility is mostly heavy petroleum, such as lube oil and weathered fuel oil, except at AOC-2 (MEK dewaxing area), where SPL is mainly MEK and toluene.

SPL was recovered from groundwater from 1994 to 2012 by pumping, using scavenger wells equipped with total fluid pumps and sorbent socks. SPL recovery began in 1994 in areas of known historical releases. The goal for removing floating hydrocarbon from the shallow aquifer was to reduce or eliminate potential hydrocarbon loading to groundwater and potential plume spread. Recovered SPL and groundwater were discharged to the on-site wastewater treatment plant via the oily water sewer system. Recovered fluids were treated prior to surface water discharge under Ergon's NPDES permit. Thirty-one scavenger wells were installed, and as SPL recovery was completed, were taken offline. By 2012, only two scavenger wells were in continuous operation. Residual SPL not recoverable by pumping was removed by placing sorbent socks into 12 monitoring and scavenger wells.

The IM was successful in removing recoverable free phase SPL and dissolved-phase concentrations in many of the impacted areas and stabilized areas where minor unrecoverable SPL remained. By 2012, SPL recovery had reached the limit of its effective capability. In July 2012, SPL recovery was discontinued for a period of one year, with EPA approval. At the end of the one-year shutdown, SPL footprint and thickness data were compared to historical SPL data. Results of the shutdown were presented in the Fourth Quarter 2013 Groundwater Monitoring Report. The data showed that SPL thicknesses had decreased, or, where thicknesses were fluctuating, no lateral expansion of the SPL areas were observed. The data indicated that continued recovery efforts could not diminish SPL levels any further. SPL recovery was terminated, with EPA's approval, with continued SPL thickness monitoring.

By 2015, two years after terminating SPL recovery, SPL thickness had increased. To address this increased thickness, SPL removal by manual bailing began. Bailing is currently done during annual groundwater monitoring events. Wells with SPL thickness greater than 0.1 ft. are bailed. The bailing continues until no measurable SPL remains in the well. SPL recovery by bailing only removes a minimal amount. Manual SPL recovery appears to have minimal effect in reducing remaining residual SPL mass in the subsurface. Figure 3 shows current SPL areas.

### D. Vapor Intrusion (VI) Investigation

SOPUS Products conducted an evaluation of forty-six Facility buildings potentially impacted by VI. VI is a process by which vapors from VOC COCs move from subsurface soil and groundwater to indoor air. From the building evaluation, SOPUS Products identified four buildings to target for VI investigation. Additionally, 12 exterior or outdoor locations were selected for soil gas sampling near or over top known SPL/dissolved plume areas and at possible future building sites. In October 2015, interior building sub-slab Vapor Pins™ and exterior soil gas sampling points were installed. In November, sub-slab samples were collected from three buildings, with two soil gas samples collected outside a fourth building because of floor slab drilling concerns. For exterior samples, a soil gas sample was collected from 5 to 6 fbgs at each of the 12 outdoor locations.

The sub-slab and soil gas samples were analyzed for BTEX, MTBE, MEK, naphthalene and atmospheric gases (AGs) (oxygen, nitrogen, methane, carbon dioxide). AGs are indicators of natural attenuation potentials of VOC COPCs. Sample results showed that only benzene exceeded EPA's vapor intrusion screening levels (VISL) for residential or industrial exposures. Benzene exceeded the industrial VISL at one exterior soil gas sample/location (at the building where floor slab drilling was a concern) and exceeded the residential VISL in one sub-slab sample location and five exterior soil gas sample locations. These sampling results indicate that VI does not pose an unacceptable risk to workers or future workers in the sampled locations.

### E. Human Health Risk Assessment (HHRA)

The HHRA is an evaluation of current and future human exposure risk to Facility-related COPC in soil, groundwater, and indoor air. A Draft Human Health and Ecological Risk Assessment Report was submitted to EPA in June 2009. EPA approved the ecological portion on February 25, 2015. SOPUS Products submitted a Revised HHRA in August 2016 to address EPA comments on the HHRA. A Final Revised HHRA was submitted August 17, 2017, which EPA approved on March 27, 2018.

To determine soil COPCs, soil sample results are compared to EPA RSLs for industrial soil. To determine COPCs in groundwater, data were compared to MCLs and EPA tap water RSLs. Facility soil impacted by COCs are localized and associated with individual SWMUs and AOCs. For screening vapor intrusion data, EPA's VISLs for commercial/industrial exposure scenarios were used (i.e., target cancer risk of $1x10^{-6}$ and a non-cancer hazard quotient of 0.1 using an average West Virginia groundwater temperature of 12.5 degrees Celsius).

The EPA-approved HHRA concluded that there is negligible potential for adverse effects to current workers exposed to soil or groundwater from the eight exposure areas. There is also negligible potential for adverse effects to workers from indoor air in current Facility buildings and future indoor workers potentially exposed to indoor air constituents in buildings hypothetically located at the exterior soil gas sampling locations. Only theoretical potable use of groundwater by hypothetical future adult and child residents yielded an unacceptable potential risk. Potential risk from consumption of off-site groundwater does not pose a risk because dissolved COCs in groundwater have not migrated off-site and are not expected to in the future.

### F. Ecological Survey and Risk Assessment (ERA)

SOPUS Products conducted an ERA that included a site visit to inventory plant and wildlife habitat at the Facility and in its vicinity. The ERA evaluated data collected from the site inventory and from the local listings of threatened and endangered species and sensitive ecological receptor areas. The ERA concluded that Facility operations preclude wildlife activity due to limited habitat. The Facility is an active industrial facility with tall chain link fencing with three strand barbed wire that inhibits wildlife access to the site. Terrestrial wildlife is unlikely to use the Facility for primary nesting or foraging habitat. There are isolated wet areas on-site but are not conducive to aquatic wildlife nesting. There are no known endangered or threatened species on-site or in the vicinity and a small off-site wetland appeared unaffected by Facility operations. The ERA concluded that there is negligible potential for adverse effects to ecological receptors of concern, exceptional value wetlands or other sensitive habitats present on or in the vicinity of the Facility.

## IV. Corrective Action Objectives

The results of the HHRA show that COCs in groundwater, surface water, soil, and sediment do not pose unacceptable risk to human health or the environment under current and presumed future industrial land-use scenarios. The HHRA determined exposure to site soil did not cause unacceptable risk to current and future site workers and ecological receptors. EPA considers unacceptable risk as greater than one excess cancer incidence in 10,000 people ($1x10^{-4}$) and an excess non-cancer health effect (hazardous index) greater than 1. A residential scenario was not evaluated because of the Facility's intended long-term industrial use. EPA has identified the following Corrective Action Objectives (CAOs) for soils and groundwater at the Facility:

### 1. Soils

EPA's CAO for soil is to prevent human exposure to contaminant concentrations above the

EPA allowable risk range of $1x10^{-4}$ to $1x10^{-6}$ and non-cancer HI of greater than 1 for an industrial exposure scenario.

**2. Groundwater**

EPA expects final remedies to return usable groundwater to its maximum beneficial use within a reasonable timeframe, given the particular circumstances of the site. For sites where aquifers are either currently used for water supply or have the potential to be used for water supply, EPA uses drinking water standards, or MCLs, as the standards for determining when cleanup has been achieved.

A Technical impracticability (TI) determination for contaminated groundwater refers to situations where achieving groundwater cleanup standards is not practicable from an engineering perspective. The term 'engineering perspective' refers to factors such as feasibility, reliability, scale or magnitude of a project, and safety of achieving cleanup standards. At this Facility, EPA has determined that restoration of groundwater to MCLs is technically impracticable in a reasonable time frame at the two TI areas depicted on Figure 4 because of unrecoverable SPL, also known as free floating hydrocarbons, which makes treatment of certain dissolved-phase COCs not practicable from an engineering perspective.

The two proposed TI Zones include the monitoring wells with dissolved-phase COC concentrations greater than their MCLs/RSLs and observed residual SPL, based on the last ten years of groundwater monitoring. The TI boundaries encompass an area at least 100 ft from wells with dissolved-phase COCs exceeding MCLs and wells with measurable SPL. The proposed TI Zones for the Facility extend to the bottom of the uppermost groundwater zone, approximately 605 ft amsl or approximately 70 fbgs, which will fully encompass known impacted groundwater and SPL (Figure 4).

SPL recovery by pumping was effective in removing floating hydrocarbons, but is no longer effective in removing residual SPL, which continues to be a source of localized groundwater MCL and RSL exceedances. There are no other practicable, available treatment technologies for the remaining SPL recovery, and the presence of residual SPL makes treatment of the dissolved-phase COCs exceeding MCLs and RSLs impracticable. Consequently, TI Zones are appropriate for the areas depicted in Figure 4.

Some natural attenuation is occurring in groundwater at the Facility. Results from annual groundwater monitoring confirm that dissolved-phase COCs, including arsenic, benzene, toluene and MEK are anaerobically degrading. COCs are not impacting the Ohio River. Dissolved arsenic levels will decrease as the dissolved VOC COC levels decrease. However, these processes are not sufficient to meet groundwater standards for unrestricted use in a reasonable timeframe, in part because of SPLs. Therefore, EPA is not selecting a monitored natural attenuation remedy for this Facility, even though natural attenuation is occurring.

Therefore, EPA's CAOs for Facility-wide groundwater are to:

1) Control exposure to COCs remaining in groundwater via engineering controls and land and groundwater use restrictions;

2) Ensure that groundwater containing elevated concentrations of COCs will not cause unacceptable risk to receptors (ecological or human);

3) Ensure that the groundwater plumes are contained and will not migrate beyond their current extent; and

4) Ensure that no groundwater discharge concentrations would result in surface water concentrations exceeding WVDEP surface water criteria.

## V. Proposed Remedy

The proposed remedy for the Facility consists of:

1) Establishment of TI Zones at the two areas depicted on Figure 4, with long-term groundwater monitoring; and

2) Land and groundwater use restrictions.

### A. Establishment of a TI Zone with Long-Term Groundwater Monitoring

EPA is proposing that long-term groundwater monitoring, along with the establishment of a TI Zone is the remedy that meets EPA's remedy selection criteria. In addition to the factors discussed in this SB, the proposed remedy is considered protective of human health and the environment because access to source areas is controlled; other groundwater remedies, i.e. groundwater extraction, are impractical; and removal of residual SPL has been completed to the extent possible. On-going natural attenuation of COCs in groundwater is expected to continue in source areas and thereby reduce plume areas. There are no exposures to contaminated groundwater nor discharges to the Ohio River. The plumes are demonstrably shrinking and pose no future risk to the River.

The TI Zones are depicted on Figure 4. SOPUS Products will be required to submit a report to EPA that: (1) documents groundwater plume stability and/or reduction and (2) confirms that groundwater from wells along the Ohio River do not exceed concentrations established in a Corrective Measures Implementation (CMI) Plan that would cause unacceptable risk to human health or the environment. Historical groundwater reports have shown that the COCs levels in groundwater are diminishing, to some extent, by natural attenuation processes and the extent of groundwater contamination is decreasing.

### B. Facility Land and Groundwater Use Restrictions

Because COCs remain in Facility groundwater at levels above drinking water standards in areas associated with SPL and potentially in the soils above levels appropriate for residential use, EPA's proposed remedy requires land and groundwater use restrictions for activities that may result in exposure to those contaminants. EPA is proposing the following land and groundwater use restrictions be implemented at the Facility:

1) The Facility property shall only be used for non-residential purposes. Non-residential uses include commercial, industrial, manufacturing or any other activity to further development, manufacturing or distribution of goods and services; intermediate and final business activities; research and development; warehousing, shipping, transport, remanufacturing; raw material storage; commercial machinery/equipment storage; repair and maintenance and solid waste management. Non-residential uses do not

include schools, day care centers, nursing homes or other residential-style facilities or recreational areas;

2) Controlled access (security gates) and fencing must be used and maintained to restrict Facility-wide access from trespassers; and

3) Facility groundwater shall not be used for any purpose other than industrial purposes and the maintenance and monitoring activities required by EPA, unless prior written approval is obtained from West Virginia Department of Environmental Protection (WVDEP) and EPA.

EPA proposes that the land and groundwater use restrictions listed above are necessary to prevent human exposure to remaining Facility contaminants. EPA proposes that the use restrictions and other remedy obligations be implemented through an Order and/or an Environmental Covenant pursuant to the West Virginia Environmental Covenant Act (W.Va. Code § 22-22.B-1 et seq.).

### C. Corrective Measures Implementation (CMI) Plan

SOPUS Products will be required to submit a CMI Plan for Final Remedy implementation to EPA for approval. The EPA approved CMI Plan will be incorporated into and become enforceable under the Order and or Environmental Covenant. The CMI Plan shall include, at a minimum:

1) A Site-wide Groundwater Monitoring Plan;

2) An Institutional Controls (ICs) Implementation Plan: The ICs Implementation Plan will establish the schedule and document the methods to be used to record, implement and monitor compliance with on-site land and groundwater use restrictions, and ensure they remain in effect and run with the land as appropriate; and

3) A cost estimate for the final remedy, as described in Section VI.B.5.

If EPA determines that additional maintenance and monitoring activities, use restrictions, or other corrective actions are necessary to protect human health or the environment, EPA has the authority to require and enforce such additional corrective actions through an enforceable instrument, provided any necessary public participation requirements are met.

## VI. Evaluation of the Proposed Remedy

This section provides a description of EPA's criteria for evaluating proposed remedies. The evaluation has two phases. First, EPA evaluates three threshold criteria as general goals. Then, for remedies that meet the threshold criteria, EPA evaluates these remedies according to seven balancing criteria to determine which proposed remedy provides the best combination of attributes.

### A. Threshold Criteria

**1. Protect Human Health and the Environment:** No unacceptable human health or environmental risks are present at the Facility; however, by implementing controls for restricting land and groundwater use, protection from potential unacceptable risks are ensured.

2. **Achieve Media Cleanup Objectives:** EPA's clean-up objectives are based on risk-reduction. Proposed remedies should meet cleanup objectives appropriate for current and reasonably anticipated future land and groundwater use. The proposed remedy does not meet groundwater cleanup standards that would allow for the beneficial use of groundwater at the Facility. Achieving groundwater MCLs is technically impracticable because of residual SPL. Objectives are to protect workers from potential exposures to Facility-related groundwater constituents at levels that may result in an unacceptable risk of adverse health effects. The proposed remedy should attain groundwater objectives, given controlled access and use restrictions.

3. **Control the Source of Releases:** Controlling sources of contamination includes reducing or eliminating further releases to the maximum extent practicable. Currently, there are no known continuing releases or leaks of contamination at the Facility.

### B. Balancing/Evaluation Criteria

1. **Long-Term Reliability and Effectiveness:** The proposed remedy will protect human health and the environment over time by controlling exposure to the hazardous constituents remaining in soils and groundwater. Long-term effectiveness is considered high because use restrictions are readily implementable and easily maintained. Natural attenuation of groundwater contaminants, as documented by periodic monitoring, is expected to be effective and reliable in the long-term because dissolved-phase COCs have shown stable and decreasing trends.

2. **Reduction of Toxicity, Mobility, or Volume of Waste:** The proposed remedy will not actively further reduce the toxicity, mobility, or volume of the remaining groundwater COCs. However, COC concentrations in groundwater have generally demonstrated decreasing and stable trends over time, which will likely continue long-term.

3. **Short-Term Effectiveness:** EPA's proposed remedy does not involve any additional activities that may pose short-term risks to workers, residents and the environment. EPA has determined that Facility-related contamination does not pose a risk to adjacent residents or on-site workers. Existing engineering control measures are in place, and once use restrictions are in place, the proposed remedy will be short-term effective.

4. **Implementability:** EPA's proposed remedy is readily implementable. Existing monitoring wells will be used. The ICs will be implemented under an Order and/or an Environmental Covenant. Facility access is already restricted. The proposed control measures are compatible with current Facility uses and operations and can be implemented, maintained, and monitored effectively under an implementation plan.

5. **Cost:** Major cost components for the proposed remedy include remedy monitoring, reporting and implementation of remedy controls which are estimated to be $30,000 to 40,000 per monitoring and reporting event. SOPUS Products will develop a cost estimate for the final remedy as outlined in the CMI Plan, which will provide a basis for financial assurance compliance. EPA considers the proposed remedy to be cost-effective.

6. **Community Acceptance:** Community acceptance of the proposed remedy will be evaluated based on comments received during the public comment period and will be described in EPA's Final Decision and Response to Comments.

7. **State/Support Agency Acceptance:** WVDEP has reviewed and evaluated this proposed remedy and concurs with its issuance.

Overall, based on the information currently available, the proposed remedy meets all threshold criteria and provides the best combination of attributes with respect to the balancing criteria.

## VII. Environmental Indicators

Under the Government Performance and Results Act (GPRA), EPA has set national goals to address RCRA Corrective Action facilities. Under GPRA, EPA evaluates two key environmental clean-up indicators for each Facility: (1) Current Human Exposures Under Control and (2) Migration of Contaminated Groundwater Under Control. The Facility met these indicators on April 14, 2004, and March 24, 2007, respectively. The environmental indicators are available at https://www.epa.gov/hwcorrectiveactionsites/hazardous-waste-cleanup-shell-lubricants-formerly-penzoil-quaker-state.

## VIII. Financial Assurance

SOPUS Products will be required to demonstrate and maintain financial assurance for completion of the Final Remedy in an amount included in the CMI Plan in accordance with 40 CFR 264.143 and 264.145.

## IX. Public Participation

Before EPA makes a final decision on its proposed remedy for the Facility, the public may participate in the remedy decision process by reviewing this SB and documents contained in the Administrative Record (AR) for the Facility. The AR contains all information considered by EPA in reaching this proposed remedy. It is available for public review during normal business hours at:

U.S. EPA Region III
1650 Arch Street
Philadelphia, PA 19103
Contact: Ms. Barbara Smith (3LD10)
Phone: (215) 814-5786
Fax: (215) 814-3113; Email: smith.barbara@epa.gov

## X. Signature

John Armstead

John Armstead, Director
Land, Chemicals and Redevelopment Division
USEPA, Region III

1.24.20
Date

**ATTACHMENT 1**

ADMINISTRATIVE RECORD


1. AECOM, 2015. "Annual Groundwater Monitoring Report," Former Quaker State/Ergon Refinery, Newell, WV. October 2015.

2. AECOM, 2016. "Annual Groundwater Monitoring Report," Former Quaker State/Ergon Refinery, Newell, WV. October 2016.

3. AECOM, 2016. Vapor Intrusion Data Summary Report. Submitted February 25, 2016.

4. AECOM, 2017a. "Revised Human Health and Ecological Risk Assessment Report," Former Quaker State/Ergon Refinery, Newell, WV. August 17, 2017.

5. AECOM, 2017b. "Annual Groundwater Monitoring Report," Former Quaker State/Ergon Refinery, Newell, WV. October 2017.

6. AECOM, 2018. "2018 Annual Groundwater Monitoring Report," Former Quaker State/Ergon Refinery, Newell, WV. November 2018.

7. AECOM, 2019. "Revised Ohio River Discharge Technical Memorandum for the Former Quaker State/Ergon Refinery." May 28, 2019.

8. AECOM, 2019. "Revised Corrective Measures Study Report," Former Quaker State/Ergon Refinery, Newell, WV. August 2019.

9. AECOM, 2019. "2019 Annual Groundwater Monitoring Report," Former Quaker State/Ergon Refinery, Newell, WV. December 2019.

10. Hydrosystems Management, Inc. (HMI), 1994a, RCRA Facility Investigation Work Plan, April.

11. HMI, 1994b, Interim Measures Work Plan and Interim Measures Monitoring, May.

12. HMI, 1995a, Proposed MW-5 Area Geoprobe Investigation, December.

13. HMI, 1995b, RCRA Closure Plan for the Stormwater Basin, December.

14. HMI, 1997a, Aeration Basin Equivalent Closure Plan, March.

15. HMI, 1997b, Soil Sampling Work Plan, API Separators, and New Heat Exchanger Bundle Cleaning Pad, March.

16. HMI, 1998, Draft RCRA Facility Investigation Report, November.

17. HMI, 1999. Aeration Basin Equivalent Closure Data Report. July 15, 1999.

18. RUST Environmental & Infrastructure, 1997. Phase II Subsurface Investigation, Quaker State Congo Refinery and Terminal, Newell, West Virginia, June.

19. Shaw, 2003, Final RCRA Facility Investigation Work Plan Addendum, Ergon West Virginia, Inc., Newell Refinery, Newell, West Virginia, August.

20. Shaw, 2005, Proposed Locations for Additional Borings and Monitoring Wells. May.

21. Shaw, 2006a, Background Data Evaluation, June.

22. Shaw, 2006b, Request for Industrial Land Use Designation, October.

23. Shaw, 2006c, Work Plan for Field Verification of Sewer Manholes and Catch Basins in the Oily Water Sewer System, May.

24. Shaw, 2007, Proposed Locations for Additional Wells, letter submittal to EPA on April 17, 2007.

25. URS, 2008. Memo: Ergon Refinery, Newell WV Site Product Thickness Evaluation Results and Interim Measures Recommendations. Submitted to the EPA on December 1, 2008.

26. URS, 2009a, No Further Action Determination Request SWMUs 14, 16, 17, and 18 Letter dated February 11, 2009.

27. URS, 2009b, Draft Human Health and Ecological Risk Assessment Report, Ergon of West Virginia. Newell, Hancock County, WV. June 2009.

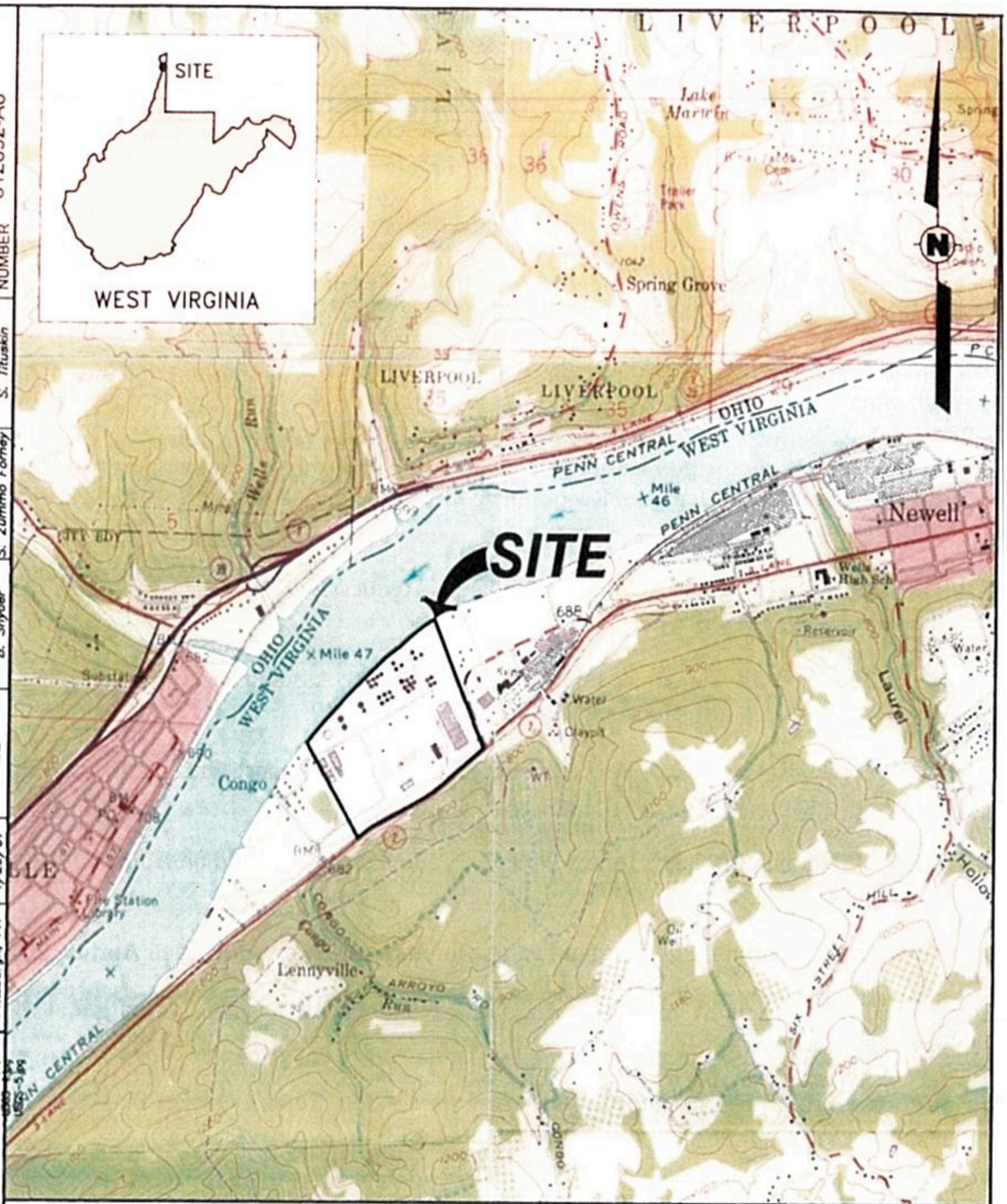
28. URS, 2009c, Revised Draft RCRA Facility Investigation Report. Ergon of West Virginia, Newell, Hancock County, WV. July 2009.

29. URS, 2009d. NFA Request for SWMUs 2, 3, and 5 was submitted on August 28, 2009 Email.

30. URS, 2014. Quarter 4 2013 Groundwater Monitoring Report. Submitted April 9, 2014.

31. URS, 2015. "Groundwater Monitoring Work Plan," Former Quaker State/Ergon Refinery, Newell, WV. April 2015.

32. Versar, 1989, Draft Interim RCRA Facility Assessment Report, Quaker State Oil Refining Corporation, Congo Plant, Newell West Virginia, April.






REFERENCE:

U.S.G.S. 7.5 MIN TOPOGRAPHIC MAP OF EAST LIVERPOOL SOUTH, OHIO – WEST VIRGINIA, EAST LIVERPOOL NORTH, OHIO – WEST VIRGINIA, PA AND WELLSVILLE, OHIO – WEST VIRGINIA, AND WESTPOINT, OHIO QUADRANGLES.

Shaw Environmental, Inc.

FORMER QUAKER STATE FACILITY
ERGON WEST VIRGINIA, INC.
NEWELL REFINERY, NEWELL, WEST VIRGINIA

FIGURE 1

SITE LOCATION AND TOPOGRAPHIC MAP

NEWELL REFINERY
NEWELL, WEST VIRGINIA

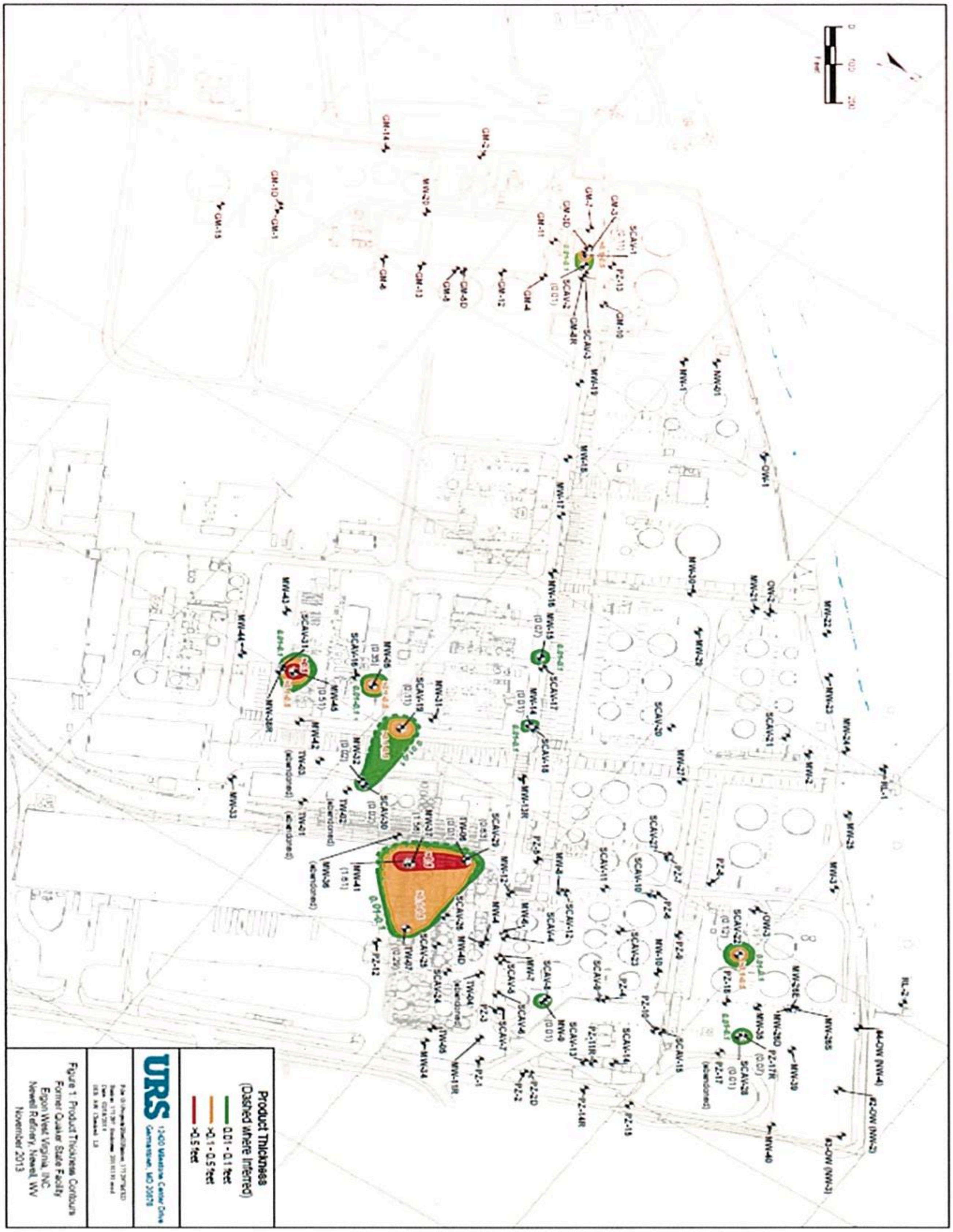



**FIGURE 2 - Product Thickness (SPL) Contours, November 2013**

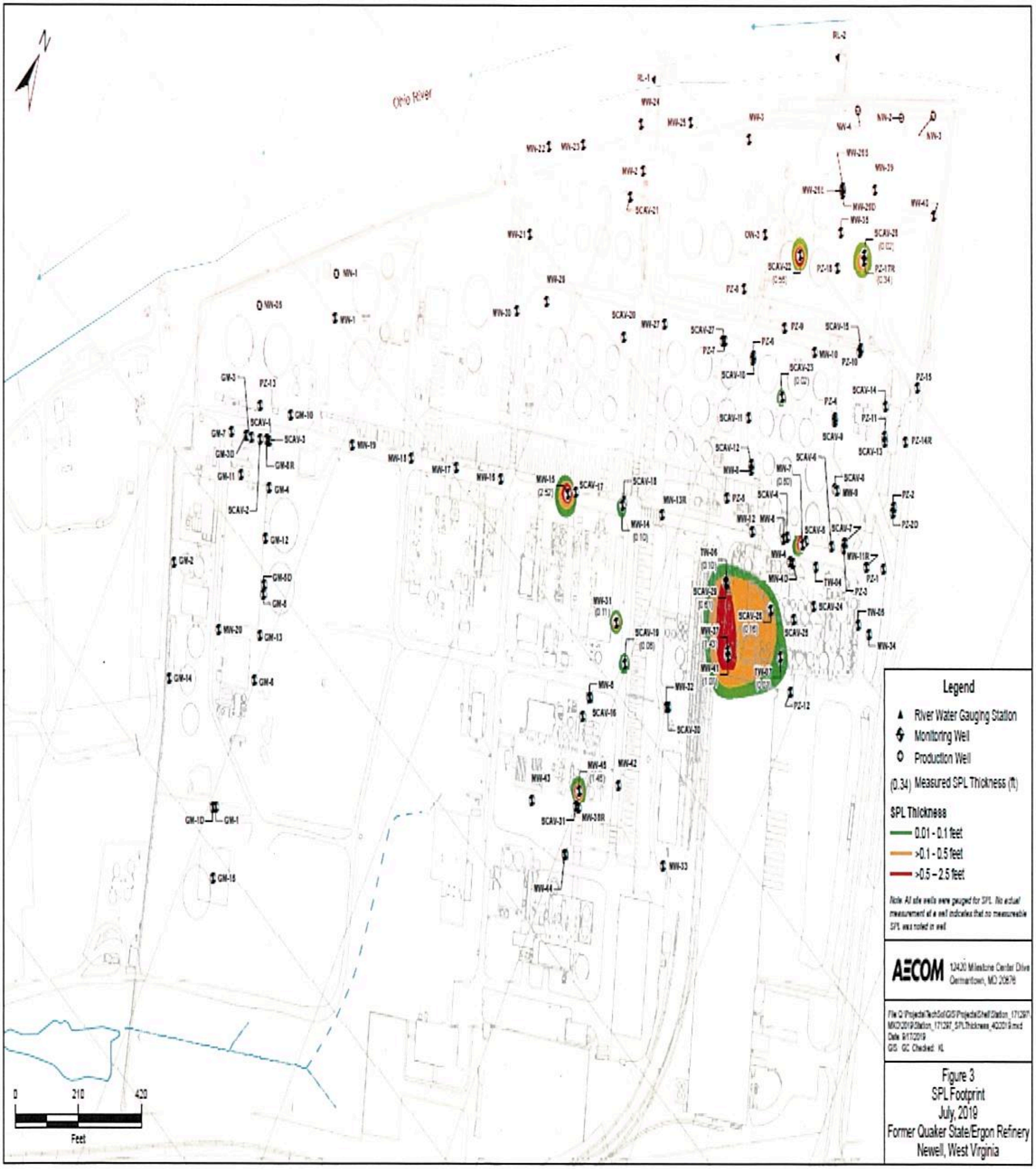



**FIGURE 3: Product Thickness (SPL) Footprint, July 2019**


**Figure 4: Technical Impracticability Zone**