UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION III

STATEMENT OF BASIS

ACTIVE PORTION OF
FORMER ARCO CHEMICAL COMPANY
400 FRANKFORT ROAD

MONACA, PENNSYLVANIA

EPA ID NO. PAD068730225

Prepared by
Office of Pennsylvania Remediation
Land and Chemicals Division
November 2018

Table of Contents

List of Acronyms

AOC	Area of Concern
AR	Administrative Record
AST	Above-ground Storage Tank
bgs	below ground surface
BTEXS	benzene, toluene, ethylbenzene, xylenes, styrene
CO&A	Consent Order and Agreement
EPA	Environmental Protection Agency
LNAPL	Light Non-Aqueous Phase Liquid
MCL	Maximum Contaminant Level
PADEP	Pennsylvania Department of Environmental Protection
PRCP	Post-Remediation Care Plan
RA/CP	Risk Assessment/Cleanup Plan
RCRA	Resource Conservation and Recovery Act
RI/FS	Remedial Investigation/Feasibility Study
RSL	Regional Screening Level
SHS	Statewide Health Standard
SB	Statement of Basis
SSS	Site-Specific Standard
TCLP	Toxicity Characteristic Leachate Procedure
UST	Underground Storage Tank
VOC	Volatile Organic Compound

Section 1: Introduction

The United States Environmental Protection Agency (EPA) has prepared this Statement of Basis (SB) to solicit public comment on its proposed remedy for a portion of the former Arco Chemical Company facility (the Facility) located in Monaca, Pennsylvania. The Facility has been subdivided into two parcels, the Active Portion and the Inactive Portion, respectively. This SB applies to the Active Portion which is currently owned and operated by NOVA Chemicals Corporation. The Inactive Portion is owned by Lyondell Environmental Custodial Trust and is not addressed in this SB.

EPA's proposed remedy for the Active Portion consists of monitored natural attenuation, the establishment of a Technical Impracticability (TI) Zone for groundwater, compliance with a PRCP and implementing land and groundwater use restrictions. This SB highlights key information relied upon by EPA in proposing its remedy for the Active Portion.

The Facility is subject to EPA's Corrective Action 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 Corrective Action program requires that facilities subject to certain provisions of RCRA investigate and address releases of hazardous waste and hazardous constituents, usually in the form of soil or groundwater contamination, that have occurred at or from their property. The Commonwealth of Pennsylvania is not authorized for the Corrective Action Program under Section 3006 of RCRA. Therefore, EPA retains primary authority in the Commonwealth for the Corrective Action Program. EPA notes that all areas of the Facility received a release of liability from the Pennsylvania Department of Environmental Protection (PADEP) under Pennsylvania's Land Recycling Program (Act 2), with the last area receiving a release in 2001.

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 (Final Decision) after the public comment period has ended.

Information on the Corrective Action program as well as a fact sheet for the Facility can be found by navigating http://www.epa.gov/reg3wcmd/correctiveaction.htm. The Administrative Record (AR) for the Active Portion contains all documents, including data and quality assurance information, on which EPA's proposed remedy is based. See Section 8, Public Participation, below, for information on how you may review the AR.

Section 2: Facility Background

The Facility is located at 400 Frankfort Road, Monaca, Pennsylvania 15061. It occupies approximately 420 acres bounded by commercial properties to the west and east, the Ohio River to the north, and primarily undeveloped hilly land to the south. For remedial purposes, the Facility has typically been divided into six areas: the Central Plant/Styrene II Area, the Over-the-Hill Tank Farm Area, the Raccoon Creek Area, the West Landfill/Dravo Quarry Area, the East Landfill Area, and the Phthalic Anhydride Area.

The Central Plant/Styrene II Area and the Over-the-Hill Tank Farm Area are located in the Active Portion of the Facility and are addressed in this SB.

A location map and Facility layout are attached as Figures 1 and 2, respectively.

The Facility was initially constructed in 1942 by the United States government to produce chemicals used to make synthetic rubber. In 1946 Koppers United Company (Koppers) purchased a portion of the Facility for the production of polystyrene. Sometime in the 1950s, Koppers purchased the remainder of the Facility producing primarily polystyrene and expandable polystyrene products.

In 1965 a partnership was formed between Koppers and Sinclair Oil Corporation (Sinclair) with each corporation owning and operating a portion of the Facility. In 1970, Sinclair sold its portion of the Facility to ARCO Polymers, Inc. (ARCO). In 1974, ARCO became sole owner through the purchase of Koppers' portion of the Facility. ARCO subsequently sold the Active Portion to NOVA Chemicals Corporation (NOVA) in 1996, and the Inactive Portion was transferred to the Lyondell Chemical Company (Lyondell). Lyondell declared bankruptcy in 2009; since that time, the entirety of the Inactive Portion was owned and managed by the Lyondell Environmental Custodial Trust until the Beaver County Corporation for Economic Development purchased the East Landfill Area and the Phthalic Anhydride Area in 2017. The Active Portion is still owned by NOVA, which continues to manufacture expandable polystyrene and advanced foam resins for use in the automotive, packaging, construction, and other industries.

The proposed remedy described in this SB is for the Active Portion only. EPA proposed the remedy for the Inactive Portion in a separate SB which was subject to the necessary public participation requirements and the Final Decision for the Inactive Portion became effective in September 2018.

Section 3: Summary of Environmental Investigations

For all environmental investigations conducted at the Facility, groundwater concentrations were screened against federal Maximum Contaminant Levels (MCLs) promulgated pursuant to Section 42 U.S.C. §§ 300f et seq. of the Safe Drinking Water Act and codified at 40 CFR Part 141, or if there was no MCL for a contaminant, EPA Region III Screening Levels (RSL) for tap water for chemicals. Soil concentrations were screened against EPA RSLs for industrial soil.

For consistency with the AR, when discussing investigations performed under oversight of PADEP, Pennsylvania's non-residential Statewide Health Standards (SHS) and Site Specific Standards (SSS) will be referenced herein where applicable.

A. The Facility

ARCO began environmental investigations at the Facility in the late 1980s and early 1990s, when several site assessments, remedial investigations and feasibility studies of each area were completed under PADEP oversight. The primary site-wide contaminants identified were benzene, toluene, ethylbenzene, xylenes, and styrene (BTEXS). In 1991, ARCO and PADEP discussed cleanup standards for groundwater. PADEP concurred with ARCO's analysis that groundwater remediation to background or drinking water levels was not practical. Analysis conducted by ARCO and approved by PADEP concluded that the MCL for ethylbenzene could not be met in fewer than 100 years.

In July 1994, ARCO entered into a Consent Order and Agreement (CO&A) with PADEP to complete planning/mobilization; supplementary site sampling; hydrogeology studies; groundwater treatability tests; soil vapor extraction; and in-situ bioremediation at the Active Portion,and required continued groundwater monitoring in that Portion. In September 1997, ARCO entered the Facility into the Act 2 Program. In October 1997, ARCO entered into a second CO&A with PADEP to complete the investigation of the Inactive Portion and to complete remediation of the entire Facility under the Act 2 Program.

In 2001, PADEP provided the entire Facility relief of liability under Act 2. The Central Plant/Styrene II Area, Over-the-Hill Tank Farm Area, Raccoon Creek Area, West Landfill/Dravo Quarry Area, and East Landfill Area achieved SSSs under Act 2; the Phthalic Anhydride Area met the SHSs for soil (no relief of liability from groundwater was given for the Phthalic Anhydride Area).

B. Active Portion

The following provides further details on the remediation activities within each area of the Active Portion:

1) Central Plant/Styrene II Area

The Central Plant/Styrene II Area (CP/S Area) consists of approximately 71 acres and is the

primary location of manufacturing activities, including associated storage tanks and the on-site power plant. It is currently owned and operated by NOVA.

The hydrogeology of this Area is described as situated on a terrace lying approximately 70 feet above the normal pool elevation of the Ohio River and composed primarily of sands and gravels, with some finer-grained materials overlying relatively low-permeability bedrock consisting of shales, thin variable sandstones, siltstones, and coals. The thickness of the unconsolidated material generally increases from zero (bedrock outcrop) at the south-southeastern Facility boundary to approximately 130 feet at the edge of the Ohio River. Groundwater beneath the CP/S Area discharges directly to the Ohio River due to a slight (0.04%) hydraulic gradient toward the River.

In June 1980, ARCO submitted a report that outlined steps taken to address several observances of ethylbenzene released to the Ohio River from the Facility. As a result of these releases, ARCO constructed a groundwater pump-and-treat system comprised of two newly-installed wells and an existing production well to remediate the area and attempt to contain the contaminant plume on-site. This system operated from 1980 to 1992, then intermittently in 1993, until PADEP approved its permanent shutdown.

ARCO submitted a Remedial Investigation and Feasibility Study (RI/FS) of the CP/S Area in 1990 that further characterized soil and groundwater contamination in the Area. The primary contaminant identified in both soil and groundwater in the CP/S Area was ethylbenzene. The highest contaminant concentrations in both soil (130 mg/kg ethylbenzene) and groundwater (280 mg/L ethylbenzene) typically occurred in a 4 feet-thick zone surrounding the water table, which is approximately 72 feet below ground surface (bgs). Light non-aqueous-phase liquid (LNAPL) was detected in some areas during the RI/FS. The risk assessment included in the RI/FS concluded that, based on the hydrogeology and contaminant characterization of the CP/S Area and the then-current and potential future use of the Facility, the only potentially significant risk would be if the Ohio River were used as a drinking water supply downgradient of the Facility, due to contaminated groundwater discharge from the Facility into the River. A risk to aquatic life was also noted due to contaminated groundwater discharge from the Facility to the River. ARCO proposed to continue operation of the existing groundwater pump-and-treat system and added vapor extraction for soil cleanup in the CP/S Area and bioremediation as a more aggressive step toward achieving contaminant mass reduction. Five areas within the CP/S Area (including the area where the groundwater pump-and-treat system, now known as the "Ohio Sparge Curtain" Area, was located) were targeted with air sparging/bioventing for a period of two years. Soil vapor extraction was also performed within the Ohio Sparge Curtain Area.

In December 1997, ARCO submitted a Risk Assessment and Cleanup Plan (RA/CP) to PADEP, which it subsequently revised in April 1998. The RA/CP concluded that surface soil met Act 2 non-residential SHS, that no drinking water exposures existed since groundwater is not used at the Facility, and that modeled contributions of contaminated groundwater to the Ohio River would not exceed applicable water quality criteria.

ARCO submitted the Final Report for the CP/S Area in May 2001. The Final Report documented that the SSS under Act 2 for hazardous constituents in soil and groundwater had been attained at

the CP/S Area, and remediation had been conducted in accordance with the requirements of the 1997 CO&A. Accordingly, PADEP approved the shutdown of the groundwater pump-and-treat system and vapor extraction system. As part of post-remediation care, notice of the environmental conditions of the Facility was given to NOVA Chemicals by way of letter and as part of the deed upon their purchase of the active portions of the Facility. Additionally, the post-remediation care plan included quarterly measurement of water levels and LNAPL thickness in selected wells for two years, and the proper closure/abandonment of all other wells within the area. PADEP approved the Final Report in August 2001. The approval letter recognized that a complete groundwater to surface water pathway exists in the CP/S Area. However, the PADEP-approved Risk Assessment demonstrated there were no risks to public health or the environment.

Upon request from EPA, NOVA performed a sampling event at four wells along the bank of the Ohio River in September 2016 to determine if the CP/S Area still contributed contamination via groundwater discharge to the Ohio River. Groundwater from the four wells was sampled for BTEXS. BTEXS were not detected in any of the four samples. EPA has determined that these results support the conclusions of the 1998 risk assessment that groundwater discharge from the CP/S Area does not result in exceedances of BTEXS water quality criteria in the river.

2) Over-the-Hill Tank Farm Area

The Over-the-Hill Tank Farm Area (OTH Area) was located on an approximately 12-acre portion of a lower terrace of the Active Portion along Raccoon Creek. This Area contained eight large aboveground storage tanks (referred to as Tanks 1-8, respectively) used to store light oil, fuel oil, benzene, ethylbenzene, and a benzene/toluene mixture from 1952 to 1988, when the last three remaining tanks were dismantled. The hydrogeology of the OTH Area is similar to the CP/S Area, with bedrock forming an effective lower boundary for shallow groundwater, which flows within the sand and gravel deposits and appears to be in direct hydrologic communication with Raccoon Creek and the Ohio River.

ARCO submitted a RI/FS for the OTH Area in 1990 (OTH RI/FS) to characterize its environmental conditions and propose remedial options for cleanup. Benzene and ethylbenzene were the main contaminants in the soil (maximum benzene and ethylbenzene concentrations 29 mg/kg and 1900 mg/kg, respectively) and groundwater (maximum benzene and ethylbenzene concentrations 390 mg/L and 59.2 mg/L, respectively) in the OTH Area. This contamination was a result of historical spills and leaks from the former tanks in this Area. The majority of contamination occurs within an approximately 4-feet-thick smear zone surrounding the water table, which is about 40 feet bgs and where LNAPL was present in suspected source areas.

The OTH RI/FS suggested that contamination migrating from the OTH Area may be contributing to elevated concentrations of semi-volatile contaminants and heavy metals detected in Raccoon Creek sediments. Although Raccoon Creek sediments were impacted, no significant amounts of organic or inorganic constituents were detected in surface water samples taken from the Creek. Two potentially significant exposure routes – ingestion of contaminated soil by workers during excavations and ingestion of surface water from Raccoon Creek or the Ohio River after mixing with contaminated groundwater – were identified in the RA portion of the OTH RI/FS Report. The RA indicated a potential risk if Raccoon Creek surface water was used

as a drinking water supply; however, this use is unlikely. A risk for aquatic life exposed to Raccoon Creek surface water was also identified. The RA concluded that groundwater contaminant concentrations (and soil contaminant concentrations, due to their potential impact to groundwater) needed to be reduced to meet acceptable health-based criteria for reasonable exposure scenarios within a reasonable timeframe and recommended a combination of soil vapor extraction, groundwater extraction, and bioremediation to remediate the area.

The 1997 CO&A required that ARCO perform air sparging and bioremediation for a period of two years to remove BTEXS from the soils and groundwater near the water table at the former location of Tanks 4 and 5.

ARCO submitted the Final Report for the OTH Area in May 2001. The Final Report documented that the Facility attained the SSS for hazardous constituents in soil and groundwater under Act 2 for this area, and remediation had been conducted in accordance with the requirements of the 1997 CO&A. As part of post-remediation care, notice of the environmental conditions of the Facility was given to NOVA Chemicals by way of letter and as part of the deed upon their purchase of the active portions of the Facility. Additionally, the post-remediation care plan included quarterly measurement of water levels and LNAPL thickness in selected wells for two years, and the proper closure/abandonment of all other wells within the area. PADEP approved the Final Report in August 2001. The approval letter recognized that a complete groundwater to surface water pathway exists in this area but that the risk assessment had demonstrated there were no risks to public health or the environment.

Under a National Pollutant Discharge Elimination System permit, NOVA is required to periodically sample groundwater monitoring wells surrounding their wastewater treatment system lagoons. Some of these wells had been impacted by historical (pre-1988) releases from the OTH Area. EPA reviewed the sampling information from these monitoring wells from 2001 to June 2016. EPA performed a well-by-well statistical analysis on benzene and ethylbenzene concentration data (the predominant contaminants) from four wells that had concentrations of those contaminants exceeding their respective MCLs. EPA determined that the results from this analysis demonstrate that contaminant concentrations in each well are either decreasing or statistically insignificant, suggesting that remaining groundwater contamination in the OTH Area is stable or decreasing.

Section 4: Corrective Action Objectives

A. Soils

Several soil cleanups have occurred under PADEP approval as part of remedial activities (e.g., Central Plant/Styrene II Area air sparging/soil vapor extraction). No significant exposure to soil occurs at the Active Portion since most of the remaining soil contamination exists at depths greater than 15 feet bgs, the Active Portion is covered by buildings and asphalt or gravel parking and loading areas, minimal operations are conducted outdoors, and the Active Portion is fully fenced and patrolled by security personnel to deter trespassing. Therefore, EPA's Corrective Action Objective for soil is to:

1) Prevent exposure to deep (>15 feet) soil within the TI Zone where metals and volatile contaminant concentrations remain above Industrial RSLs. (See Figure 2)

B. Groundwater

EPA expects final remedies to return usable groundwater to its maximum beneficial use within a timeframe that is reasonable given the site-specific conditions. For facilities associated with aquifers that are either currently used for water supply or have the potential to be used for water supply, EPA will require the groundwater be remediated to National Primary Drinking Water Standard Maximum Contaminant Levels (MCLs) promulgated pursuant to Section 42 U.S.C. §§ 300f et seq. of the Safe Drinking Water Act and codified at 40 C.F.R. Part 141, or to EPA Regional Screening Levels (RSLs) for tap water for chemicals for which there are no applicable MCL.

In the mid-1990s, ARCO's consultant calculated that the time required to remediate groundwater contaminant levels to MCLs would exceed 100 years based on site-specific groundwater modeling, projected VOC removal rates from the subsurface, and the substantial mass of contamination present beneath most of the Facility. PADEP agreed with this assessment prior to issuing the 1997 CO&A. After the remediation was conducted under Act 2, PADEP concluded that there were no unacceptable exposures to remaining contamination since contaminant concentrations in groundwater had been reduced such that groundwater discharge to the Ohio River or Raccoon Creek would not cause an exceedance of water quality criteria in the River or Creek.

EPA has examined the data supporting PADEP's decision and comes to a similar conclusion that remediation to MCLs is infeasible due to the timeframe required to achieve MCLs in groundwater throughout the entire plume beneath the Active Portion. Remediation of groundwater to MCLs beneath the majority of the Active Portion is technically impracticable given the substantial amount of contaminant mass (some present as LNAPL) remaining throughout approximately 80 acres of the Active Portion. While remediation of groundwater beneath the Active Portion may be technically possible due to several favorable contaminant and hydrogeologic factors (e.g., contaminant volatility and high hydraulic conductivity), the large volume and long duration of contaminant releases, as well as the large volume of LNAPL,

contaminated soil, and groundwater located deep beneath the Active Portion would require a scale of operations of such magnitude, complexity, and cost that remediation would be impracticable. In this case, EPA expects NOVA to monitor the stability of the contaminant plume, prevent exposure to contaminated groundwater, and continue to ensure that contaminant levels in groundwater do not exceed concentrations which may cause ambient water quality criteria exceedances in the Ohio River or Raccoon Creek. EPA's policy on technical impracticability refers to a situation where achieving groundwater cleanup standards is not practicable using current engineered treatment solutions when feasibility, reliability, project magnitude, and safety are considered. EPA is proposing that the TI Zone within the Active Portion is as outlined in the attached Facility Diagram.

EPA has determined that restoration of groundwater to drinking water standards beneath the Active Portion would provide no significant reduction in risk to potential receptors under current or future exposures. Groundwater beneath the Active Portion is not currently used as a drinking water source, nor is it anticipated to be used for drinking water in the future. Any other exposures to contaminated groundwater within the TI Zone are unlikely due to the depth to groundwater (typically greater than 40 feet), which precludes exposure from construction or trenching/intrusive operations, and the flow rate and elevation control of the Ohio River, both of which serve to limit the impact of any contaminated groundwater discharging to surface water. Additionally, ARCO conducted groundwater remediation for over 12 years, including in the primary area of groundwater discharge to surface water (i.e., the "Ohio Sparge Curtain") such that current contaminant concentrations in river wells meet MCLs. Areas where groundwater discharges to surface water or where groundwater may migrate off-site have been recently sampled, and results have confirmed that surface water is not adversely impacted, that contaminated groundwater is not migrating off-site, and that areas of remaining contamination are stable or decreasing. Since all of the primary groundwater contaminants are light and volatile, EPA expects the contaminant plume beneath the Active Portion to continue to decrease in size due to natural attenuation processes.

Therefore, EPA's Corrective Action Objective for groundwater beneath the Active Portion is to:

1) control exposure to the hazardous constituents remaining in the groundwater; and
2) protect the current existing receptors (the Ohio River and Raccoon Creek) from unacceptable BTEXS concentrations by ensuring that remaining groundwater contamination is stable or decreasing and remains within the TI Zone.

Section 5: Proposed Remedy

A. Soils

EPA's proposed remedy for soils within the Active Portion requires that:

1) The Active Portion shall be restricted to commercial and/or industrial purposes and shall not be used for residential purposes unless it is demonstrated to EPA that such use will not pose a threat to human health or the environment or adversely affect or interfere with the selected remedy and the owner(s) of the Active Portion provides prior written approval from EPA for such use; and
2) Any intrusive operations conducted within the TI Zone shall be conducted in accordance with the PADEP-approved soils management and worker protection program, which will be outlined in a Post-Remediation Care Plan (PRCP) to be approved by EPA.

B. Groundwater

EPA's proposed remedy for groundwater beneath the Active Portion consists of establishment of a TI Zone for groundwater, groundwater monitoring, compliance with a PRCP and a restriction on groundwater use so that groundwater shall not be used for any purpose other than to conduct the operation, maintenance, and monitoring activities required by EPA, unless it is demonstrated to EPA that such use will not pose a threat to human health or the environment or adversely affect or interfere with the selected remedy, and EPA provides prior written approval for such use. The PRCP, to be submitted to EPA for review and approval, shall include, at a minimum, groundwater monitoring of a frequency and duration to ensure that remaining BTEXS contamination remains stable or decreasing in both location and concentration.

C. Subsurface Vapor

EPA's proposed remedy for subsurface vapor beneath the Active Portion requires that any building or structure (not primarily for industrial/process operations involving petroleum/BTEXS constituents) that is constructed in the future within the Active Portion that will be inhabited be evaluated for the potential for vapor intrusion into such a building or structure prior to the building or structure being constructed, and additional remedial measures, as necessary, shall be performed to mitigate unacceptable risks associated with vapor intrusion into the building or structure.

D. Additional Requirements

1) On an annual basis and when requested by PADEP or EPA, submit a written certification of compliance with all terms of the final remedy.

2) Within one month after any of the following events, require the then current owner to submit written documentation to PADEP and EPA describing any:

   - observed noncompliance with groundwater use restrictions,
   - transfer of ownership,
   - change in land use,
   - application for building permits, and
   - proposed site work that could affect the effectiveness of the final remedy.

3) Generally prohibit any use of the Active Portion that would adversely affect the protectiveness of the final remedy.

4) EPA will require the owner of the Active Portion to include a coordinate and metes and bounds survey of the Facility boundary in the enforceable mechanism which implements the final remedy. At a minimum, the coordinate survey would be in a form amenable to publicly accessible mapping programs (e.g., Google Earth® or Google Maps®) and include boundaries of each area under a use restriction defined as polygons using the World Geodetic System (WGS) 1984 datum, with the latitude and longitude of each polygon vertex in decimal degrees format to at least seven decimal places and a negative sign used for west longitude.

E. Implementation

EPA proposes that the final remedy for the Active Portion be implemented through an enforceable mechanism such as a permit, order, and/or an Environmental Covenant. If an Environmental Covenant is selected as the enforceable mechanism, it will be recorded in the chain of title for the Active Portion of the Facility pursuant to the Pennsylvania Uniform Environmental Covenants Act.

Section 6: Evaluation of Proposed Remedy

This section provides a description of the criteria EPA used to evaluate the proposed remedy consistent with EPA guidance. The criteria are applied in two phases. In the first phase, EPA evaluates three decision threshold criteria as general goals. In the second phase, for those remedies which meet the threshold criteria, EPA then evaluates seven balancing criteria.

Threshold Criteria	Evaluation
1) Protect human health and the environment	This criterion is met without additional remedial actions with respect to current risk given that soil contamination within the Active Portion is primarily deep within the subsurface (>15' bgs), there is no current potable use of groundwater, and the plume of contaminated groundwater is stable and not affecting potential receptors. EPA's proposed remedy for the Active Portion will continue to protect human health and the environment from exposure to contamination, including future risks, through the implementation and maintenance of use restrictions. EPA is proposing to restrict land use to commercial or industrial purposes at the Active Portion. Remaining soil contamination within the Active Portion is primarily deep within the subsurface (>15' bgs), and any residential exposures to soils within the Active Portion are prohibited through land use restrictions. Worker exposures to contaminated soil are expected to be insignificant due to minimal operations being conducted outdoors in areas of exposed soil; construction/utility worker exposures are expected to be minimal due to the depth to contamination but will also be controlled through appropriate health & safety procedures as outlined in the PRCP. No exposures to contaminated groundwater exist due to the prohibition of its use, the depth to groundwater which makes it unlikely for construction/utility workers to encounter contaminated groundwater during any excavation activities, and its discharge to surface water not exceeding ambient water quality criteria.
2) Achieve media cleanup objectives	EPA's proposed remedy meets the media cleanup objectives based on assumptions regarding current and reasonably anticipated land and water resource use(s). The remedy proposed in this SB is based on the current and future anticipated land use at the Facility as commercial or industrial. The Active Portion of the Facility achieved the appropriate Statewide Health or Site-Specific Standards in all areas under Pennsylvania's Act 2 program by 2001. More recent sampling requested by EPA has confirmed that contaminant concentrations in groundwater beneath the Active Portion have

	continued to decrease or are stable. 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 the substantial amount of remaining contaminant mass (some present as LNAPL) and its distribution over approximately 80 acres of the Active Portion. Exposures to remaining subsurface soil and groundwater contamination are adequately controlled through land use restrictions.
3) Remediating the Source of Releases	In all proposed remedies, EPA seeks to eliminate or reduce further releases of hazardous wastes and hazardous constituents that may pose a threat to human health and the environment. The Active Portion of the Facility has met this objective, to the extent feasible, by performing air sparging, soil vapor extraction, and bioventing throughout the CP/S Area and OTH Area. Therefore, EPA has determined that this criterion has been met.

Balancing Criteria	Evaluation
4) Long-term effectiveness	The long-term effectiveness of the proposed remedy for the Active Portion will be maintained by appropriate soil management procedures, adherence to the PRCP, and the implementation of use restrictions.
5) Reduction of toxicity, mobility, or volume of the Hazardous Constituents	The reduction of toxicity of the volatile contaminants remaining in soil and groundwater beneath the Active Portion has primarily occurred (and continues to occur) through natural attenuation processes that serve to degrade these contaminants to non-toxic or less toxic constituents. Mobility of remaining contamination is naturally reduced due to the hydrogeologic features near the Facility (i.e., a large river with controlled elevation/discharge to the northwest, and low-permeability bedrock outcrops to the south and east that help to contain contamination beneath the Facility). Reduction of the volume of hazardous constituents in soil and groundwater has been achieved through the initial groundwater pump and treat system in the CP/S Area, then through soil vapor extraction, air sparging, and bioventing efforts performed throughout this area and the OTH Area.
6) Short-term effectiveness	EPA's proposed remedy does not involve any activities such as construction or excavation that would pose short-term risks to workers, residents, and/or the environment. EPA anticipates that the land use restrictions will be fully implemented shortly after the issuance of the Final Decision and Response to Comments.
7) Implementability	EPA's proposed remedy is readily implementable. EPA

	proposes to implement the use restrictions through an enforceable mechanism such as an Environmental Covenant, permit or order.
8) Cost	EPA's proposed remedy is cost effective. Most of the costs associated with this proposed remedy have already been incurred and the remaining costs to monitor groundwater and implement an enforceable mechanism are minimal (approximately $30,000/year).
9) Community Acceptance	EPA will evaluate community acceptance of the proposed remedy during the public comment period, and it will be described in the Final Decision and Response to Comments.
10) State/Support Agency Acceptance	PADEP has reviewed and concurred with the proposed remedy for the Active Portion.

Section 7: Financial Assurance

EPA has evaluated whether financial assurance for corrective action is necessary to implement EPA's proposed remedy at the Active Portion. Given that EPA's proposed remedy does not require any further engineering actions to remediate soil, groundwater or indoor air contamination at this time, and given that the costs of groundwater monitoring and implementing institutional and engineering controls at the Active Portion are approximately $30,000 per year, EPA is proposing that no financial assurance is required.

Section 8: Public Participation

Interested persons are invited to comment on EPA's proposed remedy. The public comment period will last thirty (30) calendar days from the date that notice is published in a local newspaper. Comments may be submitted by mail, fax, or electronic mail to Mr. Griff Miller at the contact information listed below.

A public meeting may be held upon request. Requests for a public meeting should be submitted to Mr. Miller in writing at the contact information listed below. A meeting will not be scheduled unless one is requested.

The Administrative Record contains all the information considered by EPA for the proposed remedy at this Facility. The Administrative Record is available at the following location:

U.S. EPA Region III
1650 Arch Street
Philadelphia, PA 19103
Contact: Mr. Griff Miller (3LC20)
Phone: (215) 814-3407
Fax: (215) 814 - 3113
Email: miller.griff@epa.gov

Attachments:
Figure 1: Location Map
Figure 2: Facility Diagram

Date: 12.3.18

John A. Armstead, Director
Land and Chemicals Division
US EPA, Region III

Section 9: Index to Administrative Record

Remedial Investigation/Feasibility Study – Over-The-Hill Tank Farm Area, prepared by Applied Hydrology Associates, January 1990.

Remedial Investigation/Feasibility Study – Styrene II Area, prepared by Applied Hydrology Associates, April 1990.

Consent Order and Agreement between Commonwealth of Pennsylvania Department of Environmental Protection and Arco Chemical Company Beazer East, Inc., October 1997.

Risk Assessment and Cleanup Plan – Over-The-Hill Tank Farm Area, prepared by ICF Kaiser, December 1997; revisions April 1998.

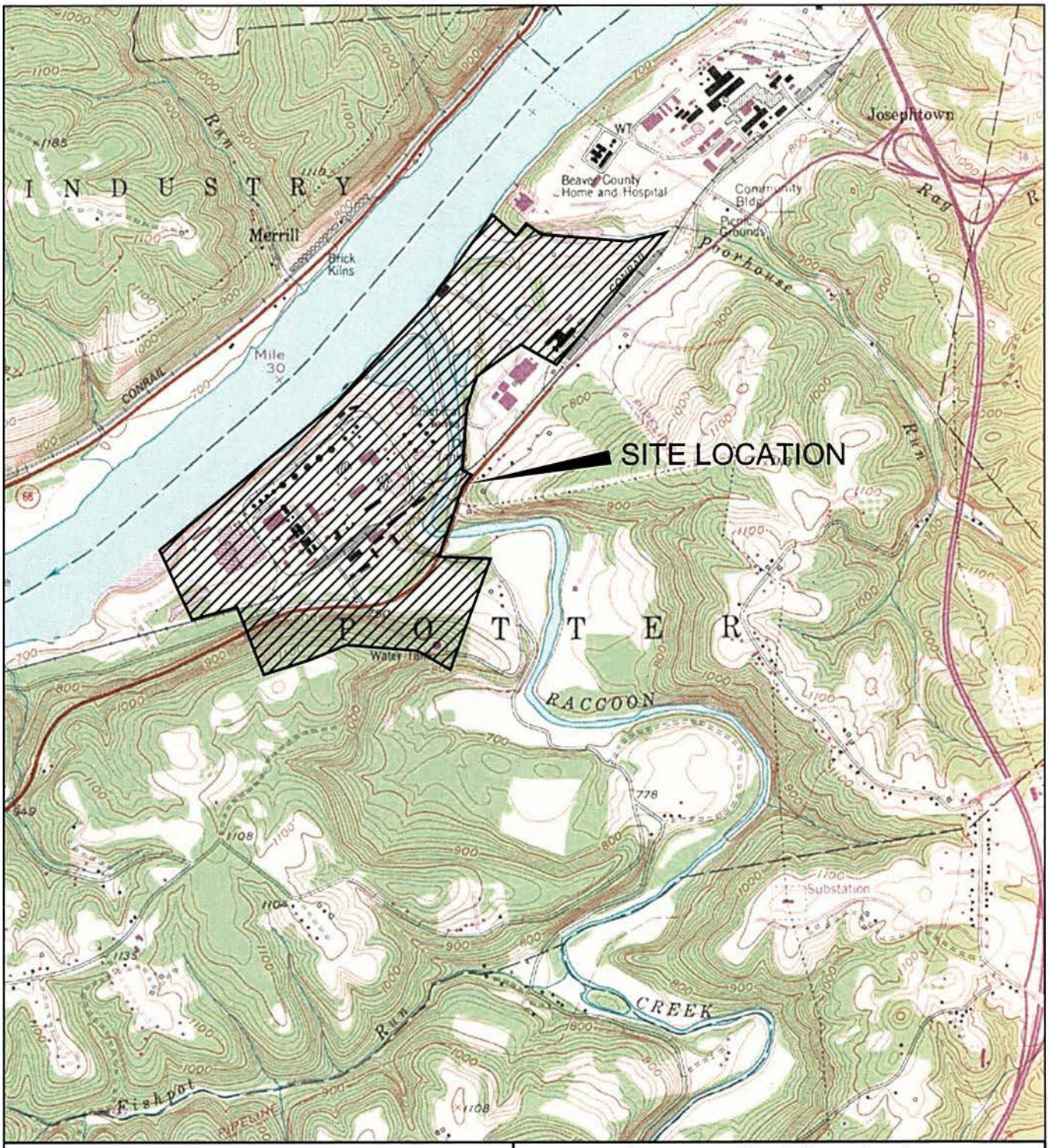
Risk Assessment and Cleanup Plan – Central Plant/Styrene II Area, prepared by ICF Kaiser, December 1997; revisions April 1998.

Final Report – Central Plant/Styrene II Area, prepared by Applied Hydrology Associates, May 2001.

Final Report – Over-The-Hill Tank Farm Area, prepared by Applied Hydrology Associates, May 2001.

Final Environmental Indicator Inspection Report for Nova Chemical, prepared by Foster Wheeler, June 2003.

River Well Location, Repair, Replacement, Sampling, and Analysis – NOVA Chemicals, prepared by KU Resources, October 2016.



Quadrangle Location Map

0 2000 4000 Feet

N

Source: U.S.G.S. Topographic Maps (7.5 Minute)
Beaver, PA

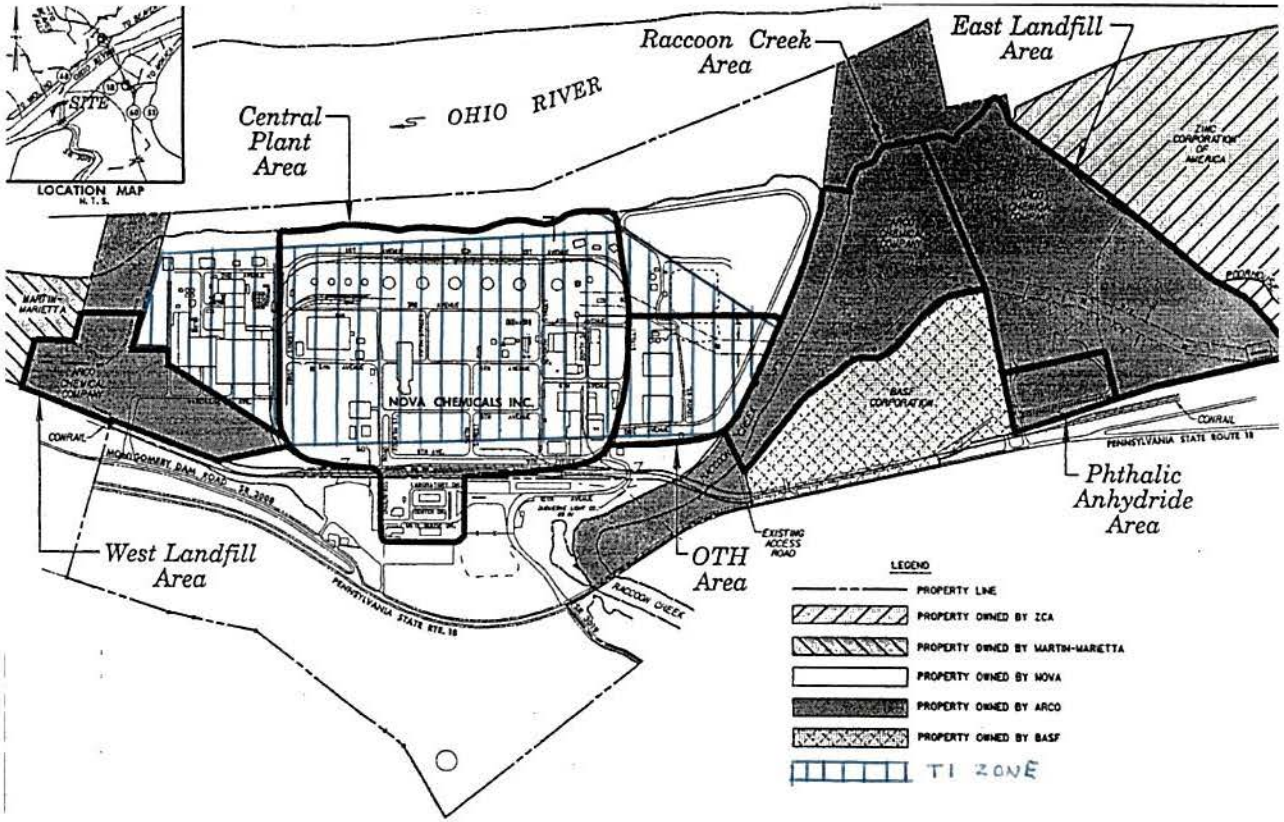
Commonwealth of Pennsylvania
Department of Environmental Protection

Nova Chemical (aka Nova Chemical Cattwo,
Beaver Valley Plant, formerly ARCO Chemical)

Figure 1
Site Location Map

FOSTER WHEELER ENVIRONMENTAL CORPORATION

site investigations_2002\NOVA Chemical\Nova_siteloc.dwg



800 0 800 1600
SCALE IN FEET

SOURCE:
BAKER ENGINEERS AND SURVEYORS,
BEAVER, PENNSYLVANIA
FIGURE: 1-1, "MAP SHOWING THE SIX AREAS OF ENVIRONMENTAL CONCERN, AND THE PROPERTIES OF ARCO CHEMICAL AND NOVA CHEMICALS INC".
DATE: 9/22/98.

Commonwealth of Pennsylvania
Department of Environmental Protection

NOVA Chemical
Monaca, Pennsylvania

Figure 2
Six Areas of Concern That
Underwent PADEP Act 2 Closure

FOSTER WHEELER ENVIRONMENTAL CORPORATION

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