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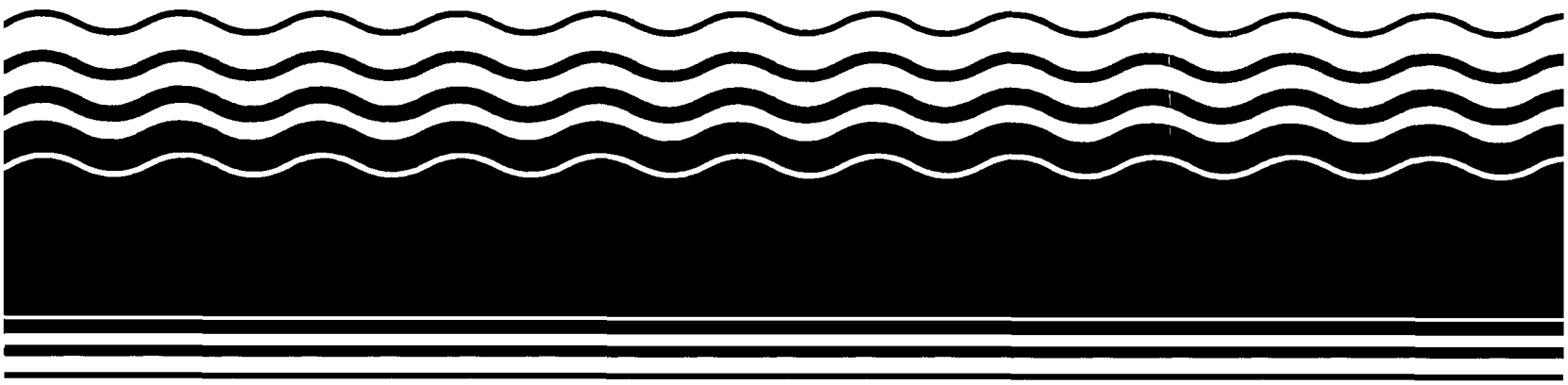
EPA Superfund
Explanation of Significant Difference for the Record of Decision:

Brodhead Creek
Stroudsburg, PA
9/30/1997



EXPLANATION OF SIGNIFICANT DIFFERENCES
BRODHEAD CREEK SUPERFUND SITE

I. INTRODUCTION

Site Name:	Brodhead Creek Superfund Site
Site Location:	Borough of Stroudsburg, Monroe County, Pennsylvania
Lead Agency:	U.S. Environmental Protection Agency, Region III ("EPA" or the "Agency")
Support Agency:	PA Department of Environmental Protection ("PADEP")

Statement of Purpose

This Explanation of Significant Differences ("ESD") is issued in accordance with Section 117 of the Comprehensive Environmental Response, Compensation and Liability Act, as amended ("CERCLA"), and is now a part of the Administrative Record for the Brodhead Creek Superfund Site ("Site"). This document explains significant differences to the remedy selected in the Record of Decision for Operable Unit 1 ("ROD") for the Site signed by the EPA Regional Administrator on March 29, 1991, as amended by the first ESD to the ROD issued on July 19, 1994. The ROD for Operable Unit 1 and the first ESD are attached hereto as Exhibit 1. This is the second ESD which EPA has issued for Operable Unit 1.

II. SUMMARY OF THE SITE HISTORY, SITE CONDITIONS, AND SELECTED REMEDY

The Site occupies approximately 12 acres in the Borough of Stroudsburg in Monroe County, Pennsylvania. The Site is the location of a former coal gasification plant which operated along the west bank of Brodhead Creek in Stroudsburg from approximately 1888 to 1944. A waste product from these operations was a black tar-like liquid ("coal tar") with a density greater than water and principally composed of polynuclear aromatic hydrocarbons ("PAHs"). The coal tar was placed in an open pit located on the Site. This practice continued to the mid-1940's when the plant was abandoned.

The geology underlying the Brodhead Creek Site consists of the following stratigraphic units in ascending order: bedrock, silty sands, stream gravels ("gravel unit"), floodplain deposits, and surficial fill. The lithology of the gravel unit can be characterized as loosely consolidated, stratified, well rounded, coarse gravels. The gravel unit thickness averages about 10 to 15 feet, but ranges from absent in some parts of the Site to a

maximum of over 25 feet in a stratigraphic depression near the center of the Site.

The principal contaminants of concern at the Site are PAHs, benzene, and arsenic. Federal Maximum Contaminant Levels ("MCLs") for drinking water established pursuant to the Safe Drinking Water Act, 42 U.S.C. Section 300f et seq., are exceeded for arsenic, benzene, and benzo(a)pyrene in the subsurface gravel unit. Proposed MCLs are exceeded in the ground water in the gravel unit for the following PAHs: benzo(a)anthracene; benzo(b)fluoranthene; benzo(k)fluoranthene; chrysene, dibenz(a,h)anthracene; and indenopyrene. These PAHs, as well as arsenic and benzene, are "hazardous substances" as defined in Section 101(14) of CERCLA.

The March 29, 1991 ROD for Operable Unit One ("OU-1") addressed remediation of the releases and the threatened releases of these hazardous substances to the subsurface soils at the Site. A complete description of the selected remedy for OU-1, as well as EPA's rationale for the decision, is presented in the ROD which is attached hereto as Exhibit 1. The major components of the selected remedy are:

(1) Installation of extraction wells and injection wells in the free coal tar areas of the subsurface soils;

(2) Recovery of coal tar and process water from the extraction wells by using the innovative technology of enhanced recovery;

(3) Separation of the coal tar from the process water followed by treatment of the process water;

(4) Discharge of a portion of the treated process water to Brodhead Creek and the reinjection of the remaining process water into the subsurface soils to enhance coal tar recovery;

(5) Disposal of the recovered coal tar at an off-site permitted incineration facility;

(6) Installation of a fence to prevent public access during remedial activities;

(7) Imposition of deed restrictions to limit future use of the Site; and

(8) Monitoring of ground water and biota in Brodhead Creek to ensure protection to human health and the environment.

The enhanced recovery process which has been employed at the Site is the Contained Recovery of Oily Waste ("CROW") process.

The ROD for Operable Unit Two ("OU-2"), issued on June 30, 1995, addressed ground water contamination and residual coal tar contamination in the subsurface soils and established a technical impracticability ("TI") zone within which EPA determined it would be impracticable to remediate ground water and residual coal tar contamination. Consequently, the ROD for OU-2 selected No Further Action for ground water and residual subsurface soil contamination.

III. DESCRIPTION OF SIGNIFICANT DIFFERENCES TO THE ROD FOR OU-1

Following the issuance of the ROD for OU-1 and during remedial design/remedial action ("RD/RA"), EPA determined that several changes should be made to the remedy set forth in the ROD. These changes were identified as Significant Differences and did not constitute an amendment, as that term is used in 40 C.F.R. §300.435(c)(2)(ii), to the ROD.

On July 19, 1994, EPA issued an ESD to the ROD for OU-1 which, among other things, modified the method that would be used to quantify the amount of coal tar to be removed during remedial action. The ROD for OU-1 stated that the enhanced recovery process would be applied to the free coal tar areas on site (the RCC area and the MW-2 area), and should involve the removal and treatment of at least 60% of the free coal tar from the subsurface soils and, if technically feasible, more than 60%. During RD/RA, EPA determined that the enhanced recovery process should be operated until the increase in cumulative recovery of coal tar dropped to 0.5% or less per pore volume of water flushed through the formation. EPA explained the reasons for this change in the July 19, 1994 ESD.

The Significant Differences between the remedy presented in the ROD for OU-1, as amended by the July 1994 ESD, and the remedy that will be implemented as a result of the ESD being issued today, are discussed below. With the exception of these Significant Differences, all terms of the ROD for OU-1, as amended by the July 1994 ESD, remain in effect.

A. EPA is Modifying the Remedy for the MW-2 Area of the Site by Substituting Intermittent Pumping for the CROW Process in this Area.

In this ESD, EPA is further modifying the remedy for the MW-2 Area of the Site by substituting intermittent pumping for the CROW process in this area for the following reasons. Based upon the assumptions made in the original feasibility study completed in 1991, the total surface area of the coal tar accumulation in the subsurface soils in the MW-2 area was determined to be approximately 450 square feet containing approximately 338 gallons of free coal tar. In December of 1993, a supplemental investigation was conducted in the MW-2 area to further

characterize the extent of free coal tar contamination in this area. This supplemental investigation resulted in a revised estimate of a total surface area of coal tar accumulation of approximately 70 square feet containing approximately 60 gallons of free coal tar. However, it is likely that neither estimate is completely accurate because of the number of data points used in the assessment and the complexity of accurately defining coal tar migration in the subsurface soil. Nonetheless, the volume of coal tar in the MW-2 Area is relatively small.

Although it would be possible to implement the CROW system in the MW-2 Area, EPA determined that it would not be economically practical to implement CROW for such a small volume of coal tar. In addition, the MW-2 Area abuts the slurry wall at the Site and is located in the bench of the flood control levee on Site. During the predesign boring program conducted in the MW-2 Area to further characterize the extent of free coal tar, several times the drill bit encountered the slurry wall and/or the rip rap associated with the levee. Thus, installation of injection wells in the MW-2 Area would be difficult, and adequate protection of the slurry wall would be a primary concern.

Therefore, EPA determined that the free coal tar located in the MW-2 Area should be removed via intermittent pumping instead of the CROW process. This change has already been implemented. Wells MW-2 and MW-2B were inspected for coal tar accumulations initially at least once per week and then less often after the first several months had passed. When coal tar was detected in the wells, the coal tar was removed via pumping. This intermittent pumping continued until EPA determined, in consultation with the Pennsylvania Department of Environmental Protection ("PADEP"), that the intermittent pumping could cease.

B. EPA is Converting the Interim Remedy for OU-1 into the Final Remedy for OU-1 and for the Site as a Whole.

EPA originally considered the remedy selected for OU-1 only an interim action for subsurface soil contamination. The ROD for OU-1 stated that a final action addressing subsurface soils and ground water would be selected in a later ROD after data generated during the implementation of the interim action were evaluated and further investigations were conducted on ground water at the Site. These further investigations would address threats at the Site presented by additional contaminated soils and ground water.

On June 30, 1995, EPA issued a Record of Decision for Operable Unit Two at the Brodhead Creek Site. This ROD addressed ground water contamination and residual coal tar contamination in the subsurface soils. The ROD for OU-2 selected No Further Action as the selected remedy. EPA determined that the No Further Action alternative, in conjunction with the OU-1 ROD, as

amended by the July 1994 ESD, would be protective of human health and the environment.

EPA gave the following reasons for this determination in the ROD for OU-2. Implementation of the OU-1 enhanced recovery program for the free coal tar areas on site would reduce the areas of highest subsurface soil contamination to residual saturation levels. (The enhanced recovery process has already been implemented at the Site; reduction in subsurface soil contamination has occurred.) The OU-1 monitoring program would provide the data required to evaluate the fate of the coal tar related constituents, the integrity of the slurry wall and the "health" of the biological community in Brodhead Creek. This will provide long term protection against the unlikely event that Site conditions might change and potential exposures increase. In addition, the slurry wall installed at the Site will continue to prevent free coal tar from discharging to Brodhead Creek.

The OU-2 ROD further stated that there is currently no significant potential for human health impact and no significant risk related to ground water exposure. Ground water is not currently used at the Site. Although hypothetical future use of on-site ground water could result in an unacceptable risk, such use is highly unlikely. Brodhead Creek serves as a regional boundary to ground water flow; thus, no ground water across the Creek from the Site would be impacted by the Site. Upward flow gradients at the Site decrease the likelihood that the bedrock aquifer beneath the Site will be impacted. A municipal ordinance in the Borough of Stroudsburg requires mandatory connection to the municipal water distribution system. EPA understands that the Borough of East Stroudsburg has a similar ordinance. Finally, deed restrictions to limit future use of the Site, including ground water use, will be imposed as part of the OU-1 remedial action.

CERCLA requires EPA to conduct its remedial actions in compliance with all environmental laws identified before the Record of Decision, if they are applicable or relevant and appropriate for the situation. These requirements are commonly referred to as ARARs.

The Record of Decision for OU-1 addressed all of the ARARs related to subsurface soil contamination. See the attached ROD for OU-1 for a full discussion of these ARARs. As discussed in the next two paragraphs, the changes to the ROD for OU-1 described in this ESD do not affect EPA's compliance with the ARAR requirement.

The ROD for OU-1 did not discuss ARARs relating to ground water or drinking water. Since the selected remedy for OU-2 required no further action for residual coal tar contamination and ground water contamination, action specific ARARs did not

apply. The only ARARs that applied to ground water were the Safe Drinking Water Act MCLs promulgated at 40 C.F.R. 141 and the Pennsylvania ARAR for ground water which required that all ground water be remediated to "background" quality, as specified by 25 PA Code §§ 264.90-264.100, and in particular, 25 PA Code §§ 264.97(i), (j), and 264.100(a)(9). In the ROD for OU-2, EPA waived the federal MCLs and Pennsylvania's "background" ARAR on the basis of "Technical Impracticability." Several site-specific constraints made the implementation of engineering solutions to the contamination impracticable. As discussed above, it is highly unlikely that ground water at this Site will be used for drinking water.

Since all of the risks from the Site have been addressed, EPA has determined that a final ROD for OU-1 is not necessary. This ESD will convert the interim remedy for OU-1 into the final remedy for OU-1 and for the Site as a whole, with the following changes to the remedy.

1. EPA is Adding a Requirement that the Sediments be Sampled for Thirty Years

The ROD for OU-1 stated that a ground water and biota monitoring program would be implemented at the Site. Among other things, the biota monitoring included benthic community monitoring, resident fish sampling, and sediment sampling in Brodhead Creek. Information collected from the sediment monitoring to date indicates that the PAH levels in the sediments of Brodhead Creek near the vicinity of Station S-3 are elevated. However, the abundance and diversity of the macroinvertebrate population and the fish community appear not to have been affected. EPA will continue to require that the sea lamprey be sampled every five years for up to thirty years. In addition, EPA is requiring that the sediments be sampled annually for up to thirty years. This will ensure that the remedy selected continues to be protective of human health and the environment.

2. EPA is Requiring that Additional Ground Water Monitoring Wells will be Added to the Long-Term Monitoring Network.

Several intermediate wells are currently screened in the silty sand unit and are being used to monitor dissolved PAHs in the ground water in that unit. The ROD for OU-2 stated that EPA would recommend adding more intermediate wells to the long-term monitoring network in the Proposed Remedial Action Plan ("PRAP") for the OU-1 final remedy. Since EPA has determined that this ESD will convert the interim remedy for OU-1 into the final remedy for OU-1, a PRAP for the final remedy for OU-1 is not necessary. Therefore, this ESD, rather than a PRAP or a final ROD for OU-1, shall require that additional intermediate ground

water monitoring wells be added to the long-term monitoring network.

These wells will monitor the Technical Impracticability zone established in the ROD for OU-2 and will serve as early indicators in the unlikely event that the dissolved PAHs in the ground water move vertically downward toward the deeper ground water in the bedrock. EPA, in consultation with PADEP, will determine the number and location of these wells.

3. EPA is Requiring that Certain Wells in the Gravel Unit be Monitored for Free Coal Tar.

Shallow wells are currently screened in the gravel unit to monitor contaminants in that unit. EPA has determined that those wells which have historically revealed the presence of free coal tar shall be monitored on an annual basis for free coal tar accumulations. If free coal tar is detected in those wells, the coal tar shall be pumped out utilizing the same procedures as were used for the MW-2 area wells. This intermittent pumping shall continue until EPA determines, in consultation with PADEP, that no free coal tar reaccumulates in the wells.

As stated in the ROD for OU-1, ground water at the site shall be monitored on an annual basis for up to thirty years.

IV. PUBLIC PARTICIPATION

This ESD and the information upon which it is based have been included in the Administrative Record file for this Site. The Administrative Record also includes the RODs for OU-1 and OU-2, the July 1994 ESD, and all documents that formed the basis for EPA's selection of the remedies for OU-1 and OU-2. The Administrative Record is available for public review at the locations listed below:

U.S. EPA, Region III
841 Chestnut Building
Philadelphia, PA 19107
Hours: Mon.-Fri., 9:00 am to 4:00 pm

and

Stroudsburg Borough Building
Seventh and Sarah Streets
Stroudsburg, PA 18360
Hours: Mon.-Fri., 8:00 am to 5:00 pm

Questions and comments on this ESD and requests to review the Administrative Record can be directed to:

John Banks
Remedial Project Manager
Mailcode: (3HW22)
U.S. EPA, Region III
841 Chestnut Building
Philadelphia, PA 19107
(215) 566-3214

V. SUPPORT AGENCY REVIEW

The Pennsylvania Department of Environmental Protection ("PADEP") has concurred with the proposed Explanation of Significant Differences in a letter dated September 29, 1997.

VI. AFFIRMATION OF STATUTORY DETERMINATION

Considering the new information that has been developed since March 29, 1991, when the ROD for OU-1 was issued, and the changes that are being made to the scope of the selected remedy for OU-1 through this ESD, the EPA and PADEP believe that the revised remedy remains protective of human health and the environment, is cost effective, and complies with federal and State requirements that were legally applicable or relevant and appropriate to this remedial action at the time the original ROD, as modified by the first ESD, was signed. In addition, the revised remedy for OU-1 utilizes treatment technologies that permanently and significantly reduce the toxicity, mobility, or volume of the hazardous substances to the maximum extent practicable for this Site.

Because the remedies for OU-1 and OU-2 selected in the original RODs, as amended by the two ESDs for OU-1, will result in hazardous substances remaining on site above health-based levels, a review of the remedies will be conducted within five years after the commencement of the remedy for OU-1. The review will be conducted to ensure that the selected remedies continue to provide adequate protection of human health and the environment.

9/30/97
Date

Abraham Ferdas, Acting Director
Hazardous Waste Management Division