91696

EXPLANATION OF SIGNIFICANT DIFFERENCES

SEDIMENT OPERABLE UNIT
FIELDS BROOK SITE, ASHTABULA OHIO

I. Introduction

The Fields Brook Site ("Site") is located in northeast Ohio, in Ashtabula County, approximately 55 miles east of Cleveland, Ohio. The U.S. Environmental Protection Agency ("U.S. EPA") is the lead agency for conducting the remedial action at the Site under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended ("CERCLA"), 42 U.S.C. Section 9601, et seq. The Ohio Environmental Protection Agency ("OEPA") served in a support role prior to 1996. Since that time, the OEPA has not been providing technical support or oversight in an effort to reduce duplicative effort.

The U.S. EPA issued a Record of Decision ("ROD") on September 30, 1986, which outlined the remedy selection process and the selected clean-up action for the Sediment Operable Unit ("SOU") of the Site. The State of Ohio ("State") concurred with the selected remedy in the ROD.

Over the past several years, U.S. EPA has engaged in discussions with several of the potentially responsible parties ("PRPs") for the Site. Upon careful review of the documentation submitted by the PRPs and information from pre-design studies, U.S. EPA has determined that several changes to the ROD should be made. These changes are protective of human health and the environment and are made pursuant to Section 117(c) of CERCLA, 42 U.S.C. §9617(c), and Section 300.435(c)(2)(I) of the National Contingency Plan ("NCP"). These changes, as described below, do not fundamentally alter the overall approach intended by the remedy presented in the ROD and they will be incorporated into the SOU remedial action to be implemented at the Site.

Section 117(c) of CERCLA, 42 U.S.C. 9617(c), and Section 300.435(c)(2)(I) of the NCP allows the lead agency to determine that a significant change to the selected remedy described in a ROD is warranted after the ROD is signed. If such action, settlement, or decree differs in any significant respect from the final plan, U.S. EPA is required to publish an explanation of the significant differences.

U.S. EPA has determined that five significant differences will be made to the ROD. The significant differences to the remedy are:

1) Elimination of solidification requirements for excavated sediments which will be landfilled on-Site;

2) Thermal Treatment of the excavated sediments will be conducted at an off-Site facility vs. an on-Site facility;

3) Development and presentation of the cleanup goals/standards for the sediment to be excavated;

4) Reduction of the excavated sediment estimated total volume from 52,000 cubic yards to 14,000 cubic yards, including a reduction of the estimated thermal treatment sediment volume from 16,000 cubic yards to 3,000 cubic yards; and

5) Elimination of the chemical waste landfill requirement contained in Section 761.75(b)(3) which specifies a fifty foot distance between the bottom liner and the historical high water table.

As none of these significant differences are considered to be fundamental changes to the SOU ROD, U.S. EPA has determined that no public comment period is required. However, U.S. EPA will hold a meeting to discuss the changes noted herein. The State of Ohio's comments regarding the significant differences are attached hereto as Appendix 1. U.S. EPA's responses to these comments are attached as Appendix 2.

This document shall become part of the Administrative Record file, which is available for viewing at the Ashtabula County District Library, 335 West 44th Street, Ashtabula, Ohio, and at U.S. EPA's Records Center, 77 West Jackson Blvd., Chicago, Illinois, during normal business hours.

II. Background

A. Site History

Fields Brook drains a six square mile watershed including an industrial area where manufacturing activities ranging from metal fabrication to chemical production have occurred over the past 50 years. Sediments of the brook are contaminated with polychlorinated biphenyls (PCBs), chlorinated benzene compounds, chlorinated solvents, hexachlorobutadiene, polyaromatic hydrocarbons (PAHs), arsenic, chlorinated ethenes (solvents), chromium, arsenic, and other organic and inorganic hazardous substances.

The Site was placed on the National Priorities List (NPL) for hazardous waste sites on September 8, 1983, and consists of Fields Brook, its tributaries, and any surrounding areas which contribute, potentially may contribute, or have contributed to the contamination of the brook and its tributaries. The Site is a multi-source site and involves multiple media, including soil, sediment, groundwater and surface water.

The U.S. EPA divided the Site into four areas of concern, three of which have been designated as "operable units" associated with the Site. The Sediment Operable Unit (SOU) involves the cleanup of contaminated sediment in Fields Brook and its tributaries, and is the subject of this ESD. The Source Control Operable Unit (SCOU) involves the location and cleanup of sources of contamination to Fields Brook to prevent recontamination of Fields Brook and the

Floodplains/Wetland Area (FWA). The Ashtabula River Area of Concern involves determining the type and amount of contamination in the Ashtabula River, the effect the Fields Brook and other contamination sources have had on the river sediments, and any risks to human health and environment. The FWA Operable Unit involves the cleanup of contaminated soils and sediments in the FWA which are located within the 100-year floodplain area surrounding Fields Brook and outside of the channel and sideslope areas of Fields Brook.

The SOU has been divided geographically into distinct but continuous portions. In order to facilitate locating features and sampling points along Fields Brook and its tributaries, the stream and system has been divided into segments identified by a unique numbering system involving stream reaches. The eastern portion of the Fields Brook watershed drains Ashtabula Township and the western portion drains the eastern portion of the city of Ashtabula. The main channel is 3.9 miles in length and begins at Cook Road, just south of the Penn Central Railroad tracks. From this point, Fields Brook flows northwest to Middle Road, then west to its confluence with the Ashtabula River. From Cook Road downstream to State Route 11, Fields Brook flows through an industrialized area. Downstream of State Route 11 to near its confluence with the Ashtabula River, Fields Brook flows through undeveloped and residential areas in the City of Ashtabula. Fields Brook discharges to the Ashtabula River approximately 8,000 feet upstream from Lake Erie. The City of Ashtabula has a population of about 23,000.

The industrial zone of Ashtabula is concentrated around Fields Brook and is comprised of several chemical industries and waste disposal sites. Manufacturing has occurred since the early 1940's in this area. Activities ranging from metal fabrication to production of complex chemical products occurred on approximately 18 separate industrial properties, and the decades of industrial activity along Fields Brook and its tributaries resulted in the release of chemical contamination to the Fields Brook watershed, particularly the sediments of Fields Brook, the FWA soils and sediments, and the soils surrounding the industries.

Between April 1983 and July 1986, a Remedial Investigation/Feasibility Study (RI/FS) was conducted for the SOU by the U.S. EPA. U.S. EPA completed the RI Report in March 1985 and the FS report in July 1986. The RI included a baseline human health risk assessment which demonstrated human health risks for the Brook sediment. The FS Report described several alternatives for remedial action of the SOU. The U.S. EPA issued a Record of Decision (ROD) for the SOU in September 1986 detailing a cleanup remedy that U.S. EPA, with the concurrence of Ohio Environmental Protection Agency (OEPA), determined to be necessary for the Fields Brook sediments.

B. <u>Description of the Selected Remedy as Set Forth in the ROD</u>

The response action selected in the 1986 SOU ROD involved excavation and containment of contaminated sediments within an on-Site landfill, and on-Site thermal treatment of the significantly contaminated or mobile sediments. Specifically, the ROD included the following components:

1) excavation of organically contaminated sediment with a greater than 1x10-6 excess lifetime cancer risk level, and inorganically contaminated sediment to health based levels or background levels, whichever is higher;

2) construction of an on-Site RCRA/TSCA landfill with separate cells for solidified sediments, solidified sediments containing arsenic, and a temporary storage cell for sediment to be thermally treated;

3) on-Site thermal treatment of both excavated sediments which are above 50 ppm PCB's, and sediments with high potential for mobility which have a soil/water partition coefficient (koc) of below 2400. Treated material would be disposed via landfilling in either: a) the on-Site landfill if analysis of the ash from thermal treatment indicates it requires management as a hazardous waste; or b) in the on-Site landfill or in an off-Site solid waste landfill if analysis of the ash from thermal treatment indicates it does not require management as a hazardous waste. The ROD estimated 16,000 cubic yards of sediment would be thermally treated;

4) solidification of the remaining quantity of excavated sediment, and disposal via landfilling in the on-Site landfill. The ROD estimated seaiment volume before solidification was 24,000 cubic yards;

5) treatment of wastewaters generated during construction activities in an on-Site treatment system, with discharge to the Ashtabula Publicly Owned Treatment Works or directly to Fields Brook;

6) completion of various pre-design studies, including:

   a) sediment quantification design investigation to determine the volume of sediments which will need to be excavated and treated or disposed and to outline initial cleanup boundaries;

   b) thermal treatment design investigation to determine the best means of thermal treatment of the sediments;

   c) facility siting design investigation to determine the best location for the thermal treatment unit and the landfill;

   d) solidification design investigation to determine if solidification is an acceptable method to reduce organic contaminant mobility;

   e) aqueous treatment design investigation to determine the best means for treating wastewater from the incineration, materials handling, and excavation efforts;

7) operation and maintenance of the remedy;

8) completion of a Remedial Investigation/Feasibility Study to address any ongoing sources of contamination to Fields Brook; and

9) completion of an investigation to address the nature and extent of contamination in the Ashtabula River.

III. Significant Differences

As a result of discussions with and information provided by the PRPs and information from pre-design studies, the following significant changes will be made to the remedial action:

1) Elimination of solidification requirements for excavated sediments which will be landfilled on-Site;

2) Thermal Treatment of the excavated sediments will be conducted at an off-Site facility vs. an on-Site facility;

3) Refinement of the cleanup goals/standards for the sediment to be excavated;

4) Reduction of the excavated sediment estimated total volume from 52,000 cubic yards to 14,000 cubic yards, including a reduction of the estimated thermal treatment sediment volume from 16,000 cubic yards to 3,000 cubic yards; and

5) Elimination of the chemical waste landfill requirement of Section 761.75(b)(3) which specifies a fifty foot distance between the bottom liner and the historical high water table.

The significant changes are discussed in detail below.

1) Elimination of Solidification Requirements:

The ROD required solidification of most of the sediments to be excavated from the brook. The significant change is to eliminate the need to solidify these excavated sediments before the sediments are landfilled.

Specifically, the ROD required solidification of sediments "containing relatively immobile or lower risk organic sediments, including sediments contaminated only with arsenic" (page 18 of the ROD). As discussed on page 25, the ROD required that "a pilot or small bench scale study be performed to demonstrate that the mobility of organic contaminants be reduced by means of solidification". This language contemplated that studies conducted during the design might indicate that mobility of organic chemicals would not be significantly reduced by solidification. The ROD further noted, in Attachment A to the ROD, that the purpose of the solidification was "to remove free liquids" (Attachment A, page 8). The need to solidify excavated sediments was intended to provide assurance that liquid contamination would not be released from the sediments after they are put into the landfill, and to provide assurance that human health and the environment would be protected. The ROD chose solidification to meet this intent, and selected a treatment method which used cement and polymers to bind up chemicals, metals and other contaminants contained within the sediment into a solid cement-like mass to provide assurance that liquid contamination would not be released from the sediments into the groundwater.

Pages 2-2 and 2-3, and Tables 2-3A through 2-3D of the 2/95 Solidification Design Investigation Report (which is included within the 30% design documents) provide the results of several leachate samples taken from untreated sediment samples taken from several areas of the highest detected contamination in the Brook. The sediment samples were taken from reaches 2-1, 2-2 and 11-4 of the Brook and are from four locations which are downgradient of the major source areas of contamination. The sediment in these areas had elevated levels of PCBs, volatile organics and other contaminants. The leachate samples of the sediments did not contain any levels which were above hazardous waste levels (i.e., the levels were below the Toxic Characteristic Leachability Procedure (TCLP) levels established under U.S. EPA's RCRA program under 40 CFR 261.24) and thus did not exhibit the characteristic of toxicity. These studies, which are in the information repositories, were conducted in part to help determine if solidification is an acceptable method to reduce organic contaminant mobility. Thus, the sediments are not expected to release toxic liquids once landfilled regardless of the volume of leachate produced.

Design studies which have been conducted since the issuance of the 1986 ROD indicate that the excavated sediments are not expected to leach significant levels of contamination after the sediments are dewatered and placed into the double-lined landfill without solidification. Even if such releases did occur, there are a series of measures which will detect, stop and treat such releases in the landfill area before any unacceptable risk to human health and the environmental occurs.

The dewatering requirements and multiple landfill components discussed below will help assure that no releases of leachate from the landfill will occur. The sediments will first be dewatered prior to landfilling, and will meet the requirements of 40 CFR 264.228(a)(2), an ARAR to be met (this ARAR requires elimination of free liquids by removal or solidification if necessary). Thus, no free liquids will remain in the sediments prior to disposal into the landfill unit. Liquids, therefore, would not likely be released from the sediments once they are dewatered. In addition, the landfill will include a low permeability cover which includes various layers including a foot of gravel/clean soil, a 40-mil FML liner keyed in, a 1/4-inch thick geonet liner, 24 inches of topsoil, and revegetation. These multiple layers will provide a high degree of assurance that future rainwater will not reach the contained sediments. The landfill will also have a double lined unit (with two separate layers of a 60-mil FML liner separated by gravel), with a leachate detection system and leachate collection system to monitor, collect and treat any leachate which might be generated. Below these layers there will be a bottom clay liner which shall be at least 5 feet above the historical high ground water table. In addition, long term monitoring, access restrictions, and institutional controls will provide protection to human health and the environment against unreasonable risks of injury. Also, no future development will be allowed on top of the landfill once it is closed, in order to provide assurance of future integrity of the landfill.

The ROD placed particular emphasis on solidifying arsenic. Design studies, however, indicated that arsenic is not present in brook sediment at significant levels which create a particular need to be concerned about its leachability. Furthermore, because arsenic was found during design studies to be present in the watershed at naturally high levels, a particular emphasis to solidify this contaminant does not appear to be warranted. The cleanup goal (CUG) for arsenic in the sediment is lower than the background levels indicated at the Site. While the calculated arsenic CUGs are 5.8 ppm for residential areas and 13.6 ppm for industrial areas, the background concentration of arsenic in the Brook is 27 ppm. The high background level is probably due to naturally high arsenic terminal moraine and glacial deposits which occurs in various locations throughout Ohio. Because background is higher than the calculated CUG, the CUG has been revised to the background level of 27 ppm. While the maximum detected concentrations for arsenic in the Brook sediment to be excavated was 180 ppm, the average arsenic concentration for sediments to be excavated is below 27 ppm, and none of the leachate samples from unsolidified sediments had arsenic detections above 5 mg/l, which is the TCLP level that indicates that the sediment was hazardous and exhibited the characteristic of toxicity.

The cost associated with solidification, as taken from the 1986 SOU ROD, are $1.23 million, using 1986 dollars present worth. These costs have escalated since 1986, and would be saved if solidification of the SOU excavated sediments was not required.

For the above reasons, and since the intent of the SOU ROD can be met without the need for solidification, this ESD eliminates the requirement of solidification.

2) Off-Site Thermal Treatment:

The ROD required on-Site thermal treatment of certain highly contaminated sediments. The significant change is to eliminate the need to thermally treat these excavated sediments on-Site, and to conduct this activity off-Site.

As noted on page 16, last paragraph of the ROD, construction of a temporary thermal treatment facility at or near the Site was anticipated. Also, on page 23 under Community Relations, it was noted that the Ashtabula Township Trustees expressed a willingness to work with U.S. EPA to identify potential locations for the construction of a thermal treatment facility. However, Appendix C of the SOU ROD provides an analysis of off-Site vs. on-Site thermal treatment facilities, and this analysis does not state a preference either for or against either on-Site or off-Site thermal treatment. During design studies, the PRPs indicated that the estimated sediment volumes slated for thermal treatment are sufficiently low enough that off-Site thermal treatment of the sediments would be more cost-effective. Off-Site thermal treatment will achieve all of the treatment requirements set forth in the ROD, which were later detailed by U.S. EPA to the PRPs during design, and will occur in a protective manner.

The specifications for off-Site thermal treatment will be detailed in the 90% remedial design (RD) document. These treatment and performance requirements for off-Site thermal treatment will be similar to those requirements already set for on-Site thermal treatment. Thus, the treatment and performance requirements do not need to be described in detail in this Explanation of Significant Differences. There is no change in the criteria determining which sediments will be thermally treated (i.e., sediments contaminated with above 50 ppm PCB's, and those sediments with high potential for mobility which have a soil/water partition coefficient (koc) of below 2400). Appendix C of the ROD listed requirements for thermal treatment, and the thermal treatment design investigation outlined treatment requirements to be met. However, because the thermal treatment will occur at an off-Site facility, the performance specifications will require that the off-Site facility be a permitted facility in compliance with environmental-related permits (see 3/8/90 NCP, page 8690-91), and also will meet the requirements of U.S. EPA's 'Off-Site Rule', 40 CFR 300.440 (9/22/93).

Information submitted by the PRPs regarding off-Site thermal disposal indicate that the current plan for transporting the excavated materials from the Brook area to the off-Site facility would be protective of human health and the environment and would not have any unacceptable short-term risks which would prohibit the off-Site disposal of the materials. The sediments would first be containerized in watertight roll-on/roll-off boxes at the excavation location and transported by truck to the pretreatment area prior to off-Site transportation. Before the containers are moved they will be inspected to ensure that no free liquids would be left in the containers before movement. The sediments will be dewatered in a pre-treatment facility to be located on-Site, and all of the liquids produced from the dewatering process on-Site would be collected and treated. The smaller sediments (i.e., below two inches diameter) will be dewatered and transported via rail from the Site to the off-Site treatment and disposal facility. In general, thermal treatment does not efficiently meet performance specifications if large particles of sediment or other material are present. The larger particles collected from the sediment areas (such as rocks or debris above two inches diameter) and which are slated for thermal treatment will be decontaminated if possible using spray wash techniques and transported off-Site via truck to an off-Site solid waste management unit for disposal. Organic materials such as roots and stumps will be thermally treated and not deconned. Information will be submitted by the PRPs to U.S. EPA prior to off-Site transportation, treatment and disposal to ensure these activities will be conducted in a protective manner, including the following: a) volumes of the materials to be shipped; b) the name, location, and ID number of each facility planned to receive the sediment materials and the volumes to be disposed at each; c) sampling/analysis procedures to meet off-Site disposal acceptance; d) the QA/QC and sampling requirements; e) manifesting procedures and regulations to be followed; and f) assurances that regulations concerning transportation, treatment and disposal of all materials will be followed.

Various other procedures will be followed to help ensure safe transport. Regulations of the U.S. EPA, OEPA, and U.S. Department of Transportation will be followed. The transportation specification will include requirements for engineering controls (e.g., liners, cover, gasketed tailgates) in trucks or railcars to minimize the potential for releases such as leaks, dusts or spills during transport. Treated sediments will only be disposed of in a solid waste unit which is in compliance with applicable regulations and is able under the regulations to accept such waste streams for disposal. The long-term effectiveness of the off-Site treatment and disposal facilities would be high, because these facilities are separately permitted and regulated by the State and U.S. EPA for protectiveness and would be in compliance with the applicable regulations appropriate for disposal.

There are other reasons why on-Site thermal treatment may not be preferable, including potential for schedule delay, increased costs, and significant public concern (as indicated in part by public comments expressing concern regarding potential for risks to local citizens, raised at the 5/93 availability sessions and public meeting). EPA's review of information submitted by the PRPs regarding on-Site vs. off-Site thermal treatment costs also indicate that there would be a cost advantage of off-Site over on-Site thermal treatment. The off-Site treatment option is estimated to cost approximately 70% of the on-Site thermal treatment option, according to the PRPs 1/10/96 "Analysis of Off-Site Treatment and Disposal Option" report which are in the information repositories.

For the above reasons, and since the intent of the SOU ROD can be met without the need for on-Site thermal treatment, this ESD eliminates on-Site thermal treatment.

3) Refinement to Sediment Cleanup Goals/Standards:

The ROD did not list the Cleanup Goals ("CUGs") which represent the maximum average concentration of contaminants that can be left within an exposure unit in the Fields Brook Sediment. Using statistics, these CUGs are translated into Confidence Removal Goals (CRGs) which will identify concentration cut lines for excavation in order to be able to meet a CUG for an exposure unit. Rather, the ROD provided a risk-based goal which the sediment remedy was to achieve. This Explanation of Significant Differences explains how that risk-based goal is being met and defines all of the SOU CUGs.

The CUGs identify the final average concentrations of contaminants within the Brook sediment. The CRGs define the contaminant concentration levels above which sediment must be removed and/or addressed as part of the SOU cleanup. The SOU ROD noted on page 18 that excavation of all contaminated sediment to the "defined" 10^{-6} excess lifetime cancer risk levels was required, and that for inorganic contaminants, the health-based guidelines be used to define the level of sediment removal. Also, the ROD noted that if any of these levels were below background levels, then the background level would be used to define the cleanup goal. The ROD did not define or list these CUGs explicitly. The 1986 Feasibility Study (FS), Appendix B, did, however, calculate and list CUGs. During the design process of the SOU remedy the CUGs were defined in a manner consistent with the risk level goals noted above, and these CUGs were consistent with the procedures outlined in the NCP and U.S. EPA guidance and policy to ensure protectiveness. Several U.S. EPA's guidances were used to define the CUGs including the following: 1989 Risk Assessment Guidance Parts A and B; 1992 Data Useability Guidance for Superfund Risk Assessments; 1989 Exposure Factors Handbook; 1992 Dermal Exposure Assessment Guidance; and 1992 Guidelines for Exposure Assessment. Also, OEPA's 1991 How Clean is Clean was used to develop the CUGs.

The CUGs were developed by U.S. EPA after discussions with the Fields Brook PRP group, in coordination with the OEPA. Many of the discussions and issues are documented in letters and reports which are included in the Site's Administrative Record. The OEPA does not agree with the CUGs due to differences of opinion over appropriate exposure frequencies. However, various U.S. EPA health risk experts within U.S. EPA's Region 5 (Chicago IL), Office of Research and Development (Cincinnati OH), and Headquarters (Washington DC) offices have reviewed the CUGs, the CRG method, and their application for this Site, and they agree that these CUGs, coupled with how they will be addressed within cleanup activities for this Site, will result in a protective remedy for human health and the environment.

The CUGs were calculated to assure protection of human health from noncarcinogenic and carcinogenic effects. Four major components were used to develop the CUGs: 1) identification of chemicals of potential concern; 2) exposure assessment; 3) toxicity assessment; and 4) risk characterization, as described below.

A) Identification of chemicals of potential concern:

U.S. EPA selected the chemicals of concern (COCs) for establishment of CUGs. The COCs are chemicals present in Brook sediments which might be of potential concern to public health. The 1986 FS identified approximately 49 COCs which were quantitatively assessed as part of the 1984 exposure assessment (as noted in Table 2-1 of the 1986 FS). The design investigations identified approximately 67 COCs for which CUGs were established, and of these 67 COCs the primary COCs which drive cleanup in the SOU and which are also noted in Table 2-1 of the FS are: 1,1,2,2-tetrachloroethane, tetrachloroethene, trichloroethene, vinyl chloride, benzo(a)pyrene, hexachlorobenezene, hexachlorobutadiene, hexachloroethane, PCBs, arsenic, and beryllium. A list of all of the COCs and of the CUGs is indicated in the CUG list provided within the "Sediment Quantification Design Investigation" report which was submitted as part of the 30% design document for the SOU, and is also provided in Appendix 3 of this Explanation of Significant Differences.

Radionuclides were investigated separately within the Brook sediments. The maximum concentrations of radionuclides measured at any location in the Brook were the Nuclear Regulatory Commission and U.S. EPA standards/levels of 30 Picocuries per gram. It is therefore unlikely that uranium contamination is contributing to the risk at Fields Brook and thus uranium is not considered a chemical of concern at the Site. U.S. EPA's 1/31/94 letter indicates the Radionuclide Contamination CUGs and factors which went into the development of these radionuclide CUGs; these radionuclide CUGs are also attached to this Explanation of Significant Differences (Appendix 3).

B) Exposure assessment

The exposure assessment identified potential pathways by which exposures can occur and characterizes various factors including the potentially exposed populations and the type, frequency and duration of these exposures. Regarding the selection of the routes by which contaminants may enter the body, the only exposure route ultimately considered in the development of CUGs during the design of the SOU remedy was ingestion of sediments during direct contact with Fields Brook. Screening risk calculations showed that the other possible exposure routes which were considered in the FS (e.g., dermal absorption and inhalation) were insignificant when compared to the ingestion exposure route. Ingestion would occur inadvertently from hand to mouth activity by persons having soils or sediments on their hands due to contact with the Brook sediments. Inhalation was eliminated because volatilization and particulate emissions from Brook sediments which may mostly be wet will not be significant. Dermal absorption risk was also relatively small compared to direct ingestion risk. Thus, U.S. EPA determined that CUGs based on the sediment ingestion exposure route will also assure protectiveness from the other exposure routes associated with the Brook sediment.

The 1986 FS assumed residential use exposure frequency estimates of 243 days per year for 70 years, which were refined to the following exposure frequencies: 20 days per year for the residential child (ages 5-6), 60 days/year for adolescents, and 20 days per year for adults, for a total of 26 years. Also, the 1986 FS assumed that industrial exposures occurred at an exposure frequency of 243 days per year for 40 years, which were refined to 60 days per year for 25 years during the design process. Further, the sediment ingestion rates assumed in the calculation were changed. The 1986 FS estimated that residential ingestion rates were 1 gram/day for three years, 10 grams/day for two years, and 0.1 grams per day for 66 years, which were refined to 0.2 grams/day for two years, 0.1 grams per day for 9 years, and 0.05 grams per day for 15 years. Also, the 1986 FS assumed that industrial ingestion rates were 0.1 grams/day for 40 years, which were refined to 0.05 grams/day for 25 years.

The reassessment of exposure considered a number of factors, including the types/ages of people exposed, the frequency, and the exposure routes. The Brook was divided into two major segments, based on demographics and land use: a residential segment, west of State Road, and an occupational segment east of State Road. Different types of and frequencies of exposures were assumed to be different in residential versus occupational areas; higher exposures, leading to lower CUGs, occurred in the residential segment. U.S. EPA considered a variety of factors when assessing exposure, including a survey conducted by the Fields Brook PRPs of residents and workers within the area, discussions with local residents on evidence of exposure along the Brook, best professional judgement of future unrestricted residential exposures to sediments, and a balance of various other factors including expected future land use.

The areal size of the Fields Brook sediment exposure units (SEUs) was a source of uncertainty in the applications of the CUGs. Considerable discussions occurred between the State of Ohio, U.S. EPA and the PRPs regarding what is the appropriate size of the Fields Brook SEUs. These discussions considered what would be the appropriate length of the SEUs which adequately represents the geographic area to which a given individual would be exposed. Upon consideration of this information, U.S. EPA judged that it would be acceptable to divide the Fields Brook sediment areas into ten separate SEUs, each of approximately 2000 feet in length along the Brook, which represent the geographic area to which a given individual would be exposed. U.S. EPA has reviewed these lengths and concluded that if after cleanup activities occurred contamination levels were on average at or below the Cleanup Goals for each SEU, the remedy would be protective of human health and the environment. The development of the SEUs followed U.S. EPA guidance for their development (i.e., U.S. EPA's 1989 Risk Assessment Guidance (RAGs), pages 3-3, 6-4, 6-19, and 6-30) and considered a variety of factors which are considered such as differences in land use, terrain, accessibility or medium type which can affect exposure, and homogeneousness regarding contamination. The use of the SEU concept for cleanup of the Brook sediment is also consistent with U.S. EPA's 1992 "Calculating the Concentration Term" Supplemental Guidance to RAGs. The SEUs associated with each designated land use and reach of the Brook are as follows:

- **Residential:**
  SEU1 Reach 1
  SEU2 Reach 2-1, 2-2, and part of 9
  SEU3 Reach 3
  SEU4 Reach 4
  SEU5 Reach 11-1 and 11-2
  SEU6 Reach 5-1 and 5-2

- **Industrial:**
  SEU7 Reach 11-3 and 11-4
  SEU8 Reach 6 and 7-1
  SEU9 Reach 7-2 and 8-1
  SEU10 Reach 8-2, 8-3, 8A, 13-1, 13-2, and 13A

U.S. EPA designated, for risk purposes, residential use cleanup goals for all sediment areas west of State Road and industrial use for all sediment areas east of State Road. SEUs 7-10 are thus considered to have industrial use. U.S. EPA considers this to be protective since there is a buffer zone of approximately 4000' of brook between the areas where contamination was released from the industries and the residences. The area between State Road and Route 11 is considered a "mixing zone" between the industry and residence CUGs, and while no residences exist there, the area will be remediated to residential development levels.

Various U.S. EPA staff who are responsible for reviewing and developing risk documents and making risk management decisions were consulted, and these staff agreed that the selected exposures and considerations used to calculate the residential and occupational CUGs were acceptable. This included the assumption that no exposures under age five reasonably occurred because parents would restrict access of small children to flowing bodies of water. These U.S. EPA staff agreed that the overall proposed integrated approach was acceptable and consistent with U.S. EPA risk assessment guidance and practice, and that the assumptions which were based on survey information, use of safety factors, comparison to other Superfund sites, consultation with U.S. EPA experts, and U.S. EPA's best professional judgment represented the RME ("reasonable maximum exposure").

C) Toxicity assessment:

The toxicity assessment identified the type of hazards or health effects associated with the exposure to the chemicals of potential concern; it also described the dose-response relationships of those chemicals.

Changes to the 1986 FS reference dose (RfD) values occurred during the design process for the calculation of non-cancer risk CUGs for naphthalene, 1,2,4-trichlorobenzene, and zinc; the most current RfD values were used. Also, RfD values derived from dietary studies were used to refine the CUGs for cadmium, manganese and selenium.

Several cancer risk slope factors (CSF) were updated when changing the CUGs. CSFs for the various polyaromatic hydrocarbons (PAH's) such as benzo(a)pyrene, benzo(a)fluoranthene and others were changed. The method used to develop the ROD's PAH CUGS involved use of the benzo(a)pyrene (BaP) CSF as the default to determine the risks of all PAH's. During design, U.S. EPA used the toxicity equivalency factors (TEF) approach for assessing PAH risks. The TEF approach used the CSF of each separate PAH as the CSF rather than the BaP CSF to determine the risks for each PAH, which resulted in different CUGs for each PAH. This is the currently accepted procedure within U.S. EPA to assess PAH risks.

PCBs encompass a class of chlorinated compounds which includes up to 209 variations, or congeners, with different physical and chemical characteristics. Specific combinations of PCB congeners are generally unique to each site. PCB congeners are grouped into categories of PCBs which are known as Aroclors. Certain Aroclors are commonly associated with insulation systems, others used in hydraulic, lubricating and heat transfer fluids, and still others as dielectric fluids in transformers. These three types of Aroclors were used within the Fields Brook site. It was agreed upon by both U.S. EPA and the PRPs during meetings in 1994 and 1995 to consider all of the Aroclor's and congeners together as total PCBs in the CUG calculation.

It should be noted that the PCB CSF was recently revised to 2.0 $(mg/kg\text{–}day)^{-1}$ which was entered onto the Integrated Risk Information System (IRIS) October 1, 1996. The recently revised and current CSF of 2.0 results in PCB cancer risk CUGs of 5.0 ppm on average in residential areas and 11.9 ppm on average in industrial areas. The former CSF of 7.7 results in PCB cancer risk CUGs of 1.3 ppm on average in residential areas and 3.1 ppm on average in industrial areas.

Upon consideration of the various issues associated with PCB risks at the Fields Brook site, U.S. EPA has set the total PCB CUGs for the SOU as follows: 1.3 ppm on average in residential areas, and 3.1 ppm on average in industrial areas. These SOU PCB CUGs are slightly lower in concentration than CUGs based solely on the recently revised CSF. These SOU PCB CUGs are based on U.S. EPA's risk management decision to be protective of ecological receptors at the site, and to attempt to be protective and account for the uncertainties regarding the endocrine disrupter health effects. Also, this decision reflects U.S. EPA's attempt to account for the potential synergistic effects of the multiple contaminants in the SOU which may increase health risks associated with the predominant chemical of concern in the SOU, which is/are PCBs.

Regarding the need to be protective of ecological receptors at the site in developing the SOU PCB CUGs, a 2/97 "Focused Ecological Risk Assessment" of the brook sediment was recently prepared by U.S. EPA to estimate post-remediation risk levels to ecological receptors such as mink which are or may be exposed to the Brook; this report is in the Site's Administrative Record. This focused assessment indicated the potential for significant risks to ecological populations associated with exposure to PCBs. The assessment notes that post-remediation average concentration chronic hazard quotient (HQ) calculations using the above noted PCB CUGs indicated that there may be several species with HQ exceedences of 1. HQs above 1 may indicate a risk of adverse effects to species. However, U.S. EPA believes that a SOU remedy which meets the above noted PCB CUGS would protect the various populations of ecological receptors which exist or may exist within the Brook or rely upon food sources associated with the Brook. The response actions would reduce the short- and long-term risks to ecological populations and reduce these population's potential uptake of contamination via soil and food to acceptable levels of exposure. It should also be noted that the HQ calculations were developed using conservative assumptions based on "no observable adverse effect levels" to ecological receptors, which would help provide for protectiveness to ecological receptors. The Ohio EPA, as a natural resource trustee, is concerned that the SOU remedy may not be protective of ecological receptors and intends to conduct post remediation biomonitoring to assess the extent to which injuries to the natural resources continue to occur.

Regarding the need to attempt to be protective and account for the uncertainties regarding the endocrine disrupter health effects in developing the SOU PCB CUGs, it should be noted that although the PCB cancer risk slope factor changed from 7.7 to 2, at this time there is no agreed-upon quantitative method within U.S. EPA to incorporate the endocrine disruption data into a toxicity value. There is reason to believe that the endocrine disrupter effect may be the most sensitive health effect of PCB exposure. Also, U.S. EPA's general practice is to err on the side of caution regarding use of uncertain data; the endocrine disruption uncertainties provide justification for the use of a conservative PCB cleanup goal calculation. As endocrine disrupters, PCBs have the potential to negatively impact the developing fetus, increase vulnerability to certain cancers, and possibly decrease fertility. While an RFD has not been calculated based on these endpoints, the current evidence suggests that PCBs have the potential to disrupt the endocrine system.

D) Risk characterization:

The risk characterization integrated the information developed during the toxicity and exposure assessments to estimate the potential risks to public health from exposure to Site contaminants. These risk estimates were then used to calculate the CUGs. To recalculate the CUGs, the risk characterization effort integrated the above-noted changes to the COCs which were identified, the exposure assessment default parameters, and toxicity assessment considerations with other risk-related assumptions which did not change from the assumptions made in the ROD. The ROD also noted that cleanup to a 10^{-6} risk level for carcinogens was required, and the recent recalculation of the CUGs was based on a $1x10^{-6}$ risk. This clarification is made to make clear what specific risk level was used. The specific risk level determination was made based on Site-specific factors, including that there are multiple contaminants of concern involving multiple media associated with exposure to Brook sediments.

A list of all of the SOU CUGs is provided in Appendix 3 of this Explanation of Significant Differences.

For the above reasons, this Explanation of Significant Differences explains how the SOU ROD's risk-based goals were met and defines all of the SOU CUGs.

4) Reduction in ROD Estimated Excavation Volumes:

The ROD estimated that 52,000 cubic yards would be excavated from the Brook. Design studies indicate that approximately 14,000 cubic yards need to be excavated.

The SOU ROD's "Recommended Alternative" section indicates that sediment was required to be excavated to the cancer risk and health based levels discussed in the above section. The ROD does note on page 18 that 36,000 cubic yards of sediment were estimated to be contaminated with arsenic, relatively immobile or lower risk organic contaminants, and that 16,000 cubic yards of sediment was estimated to be designated for thermal treatment. The ROD did not explicitly state that all sediment in the Brook be removed or that sediment from each excavation location should be excavated to the soil/sediment or bedrock/sediment interface. The ROD, on page 18, second bullet, referenced Appendix M of the 1986 SOU FS for a complete breakdown of remedial components including a sediment excavation volume of approximately 38,700 total yards. However, this FS estimate is inconsistent with the total ROD estimated volume discussed above (52,000 cubic yards: the sum of the 36,000 and 16,000 cubic yard volumes noted above) and is also inconsistent with the estimated sediment excavation volume of 43,500 cubic yards in Appendix H of the FS. The ROD notes on page 24 that sediment quantification design studies were necessary to determine the overall sediment quantities to be excavated as well as determine which sediments would be thermally treated vs. landfilled. Also, the ROD notes in this section that the size of the remedial facilities would be adjusted during design in the event that sediment quantities changed significantly. Appendix M also indicates, in Table M-4, that 24,000 linear feet of the Brook was anticipated to be excavated. The FS also estimated a sediment excavation depth of 30 inches for all remedial alternatives including the selected remedy, and noted that additional sampling and testing during design and implementation would better define the extent (horizontal and vertical) of sediment removal (as discussed on page 5-23 of the 1986 SOU FS).

The sediment quantification studies, which are part of the February 1995 30% design documents, indicate that sediment quantification sampling, scour analyses, and statistical application of the CUGs efforts conducted during design of the Brook ROD have reduced the total sediment excavation volume from the ROD-estimated 52,000 cubic yards to approximately 14,000 cubic yards, and have reduced the ROD-estimated 16,000 cubic yards volume of sediments to be thermally treated to approximately 3,000 cubic yards. Also, the 24,000 linear feet of the Brook anticipated to be excavated has been reduced from the ROD-estimated 24,000 linear feet to the current estimate of 8,305 linear feet, as noted in the October 1995 60% design report's excavation plan and profile sheets. Also, the excavation depths were changed from the 30 inches total depth assumed in the ROD to excavation depths varying between twelve inches to forty-two inches, depending on scour depth in that sediment location as determined through the hydrologic and scour analyses which were conducted and reported in August 1994. It is also possible that these estimated sediment excavation volumes, lengths and depths may further change based on data from the delineation sampling that was conducted in the spring of 1997. The results of this sampling effort are currently being reviewed. It is not expected that the results will significantly change the estimated sediment excavation volumes, lengths and depths.

The sediment quantification sampling, scour analyses, and statistical application of the CUGs efforts conducted during design of the Brook ROD are further discussed below.

A) Sediment Quantification Sampling Summary

A total of approximately 70 Phase I Sediment Quantification Design Investigation (SQDI) sediment sample locations were sampled along the Brook, followed by approximately 140 Phase II SQDI additional sample locations, with samples spread relatively evenly across each SEU ranging from approximately 100-250 feet spacings. During the Phase II Study, a sufficient number of sampling locations were located within each SEU to represent a statistically valid number of samples. The sampling locations involved taking a surface sediment sample at each location along the upper one foot of the sediment; also, if sediment extended to three foot or more in depth, an additional sample was frequently taken between the two and three foot thick depth.

The Phase I SQDI samples were analyzed for approximately 130 different chemicals (i.e., the TCL and TAL parameters). The Phase II samples were analyzed for the eleven COCs discussed previously which exceeded CUGs in the Phase I SQDI samples. The COC concentrations vary from background and nondetect levels to several hundred parts per million (ppm or mg/kg). No CUG compounds were exceeded in background except for arsenic. As indicated in the 30% and 60% design reports, the data indicated that there were no exceedences in the sediment above the CUGs in SEUs 9 and 10 from the Phase I and II SQDI sampling results, and therefore these SEUs were eliminated from further consideration for remedial work. The data also indicated a number of lengths of the Brook sediment in the other SEUs where there were no CUG exceedences. As discussed previously, additional delineation sampling will be conducted in the brook sediment during the spring of 1997. However, it is not expected that this sampling will significantly change the estimated sediment excavation volumes, lengths and depths.

B) Scour Analysis:

The PRPs conducted a 1994 scour analysis to determine the depth at which hydraulic scour could occur from a 100-year storm into or below the Brook sediment. The following methodology was used by the PRPs at U.S. EPA direction to calculate scour depth from a 100-year storm event in a uniform reach with a consolidated cohesive bed and negligible bed material:

1) Develop an erosion rate vs. shear stress curve for the stream bed.
2) Develop a shear stress vs. discharge rating curve.
3) Using the flow duration curve and/or the 100 year hydrograph, develop a shear stress "hydrograph".
4) Integrate the 100-year "shear stress hydrograph" and/or the "shear stress duration curve" with the erosion rate vs. shear stress rating curve, to obtain scour depth.

The methodology first calculated the average sediment scour depth using engineering properties for the calculation, and integrating the flood event down to the depth of the sediment. Where the sediment was scoured to soil depth, the integration was continued on the soil below the sediment, calculating scour using the different erosion properties of the soil for the calculation, to determine the depth of total scour/erodibility for that location. These efforts included developing computer models (e.g., HEC-1 and HEC-2 flow model analysis) approved by U.S. EPA and the U.S. Army Corps of Engineers, and used data collected from the field including actual cross sections/surveying information (approximately 18 sections were taken in the field), and physical data of the sediment and soil including Atterberg Limits, grain size analysis, and moisture content.

The scour analyses indicated that depth of maximum scour in particular locations would be between one and 3.5 feet of total sediment depth. There are several areas where the sediment was calculated to scour to bedrock depth; in these locations the maximum excavation depth is the depth of bedrock. The depth of excavation will be limited to depth of scour and not the depth of sediment. In certain areas sediment below a one foot or two foot depth will be left after remediation based on scour analysis.

U.S. EPA has determined that it is acceptable to leave contaminated materials below the calculated scour depth in the Brook sediment and install erosion-protection materials in excavation areas, because these materials would not scour nor be exposed to present a danger to human health or the environment in the future, even if a worst-case event, such as the largest rainstorm which would occur every 100 years, occurs. Also, regarding the potential for recontamination of Brook sediments from the underlying sediments, there is no significant potential that recharging groundwater might mobilize contamination from these deeper contained-in-place sediments and recontaminate cleaner sediment. U.S. EPA's risk assessment guidance and policies do not require cleanup of areas which are not or would not become exposed to human health or the environment.

To ensure protectiveness, erosion-resistant materials will be installed in all sediment excavation areas during the construction of the remedy, to assure that these areas will not be released in the future. In addition, erosion-resistant materials will be installed in all potentially scourable areas from areas where excavation is planned in the Brook downstream regardless of excavation location. The PRPs also propose to install geotextile liners on top of sediment areas to receive erosion protection; this proposal will be considered acceptable if information regarding chemical compatibility, durability and long-term effectiveness is provided as part of this proposal. U.S. EPA will review this information when it is submitted within the 90% design document. Also, operation and maintenance inspections will help ensure that all areas of the Brook which had excavation activity and erosion protection installation remain protective. In addition, post-remediation monitoring will be conducted and include sampling of sediment within the Brook to evaluate Site conditions following clean-up. The post-remediation chemicals to be monitored will focus on the eleven primary chemicals of concern noted above, and primarily on PCBs and HCB. The eleven primary COCs will be analyzed yearly for at least five years after cleanup, and these contaminants are the key indicators regarding whether the SOU remedy remains protective and whether chemical concentrations are increasing or not in the Brook sediment after cleanup. Regarding duration of sampling, U.S. EPA's current recommendation is for post-remediation monitoring to extend for a period of 5 years. At the end of the 5 year period, a re-evaluation will be made as to the appropriateness of extending the monitoring time period. Post-remediation monitoring will not necessarily terminate after 5 years.

For the above reasons, this ESD changes the sediment volumes to be excavated.

5) Elimination of the chemical waste landfill requirement contained in Section 761.75(b)(3) which specifies a fifty foot distance between the bottom liner and the historical high water table:

As part of the Record of Decision for the Floodplains/Wetlands Operable Unit (signed on June 30, 1997), U.S. EPA Region V waived the requirement of Section 761.75(b)(c) which specifies a fifty-foot distance between the bottom liner and the historical high water table. This waiver was proper in this case because the final remedial action will provide protection to human health and the environment against unreasonable risks of injury. No significant reduction in the long-term risks would be gained from the off-site disposal of the PCBs contained within the sediments and soils to be excavated, and the costs for the analyses to detect the extent of PCBs and for off-site disposal of the PCBs are potentially large. The consolidation unit to be built will provide for adequate protection of the underlying groundwater resource, in part because the landfill to be constructed will include a low permeability site cover, double lined unit, leachate collection system, leachate detection system, a bottom clay liner which shall be at least 5 feet above the historical high ground water table, long term monitoring, access restrictions, and institutional controls.

This Explanation of Significant Differences documents the waiver of the TSCA landfill requirement discussed above for the construction of the on-site landfill to be built to house excavated material from the Sediment, Floodplain/Wetland and Source Control Operable Units.

IV. Conclusion

U.S. EPA has reviewed the new information that has been developed and has considered the changes that have been made to the selected remedy. Based upon this review, U.S. EPA has determined that the selected remedy, with the changes described above, will remain protective of human health and the environment, will comply with federal and State requirements that are applicable or relevant and appropriate to this remedial action, and will be cost-effective. In addition, the revised remedy utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable for this Site. Upon careful scrutiny of the suggested changes and the information submitted to support such changes, U.S. EPA, therefore, has changed the remedy set out in the ROD in the manner described above.

Wm. E. Muno
William E. Muno
Director, Superfund Division

8/15/97
Date

Appendices

Appendix 1: State Comments

Appendix 2: U.S. EPA Response to State Comments

Appendix 3: List of Cleanup Goals (CUGs)

APPENDIX 1

COMMENTS
FROM
THE STATE OF OHIO

OhioEPA
State of Ohio Environmental Protection Agency

STREET ADDRESS:
1800 WaterMark Drive
Columbus, OH 43215-1099

TELE: (614) 644-3020 FAX: (614) 644-2329

MAILING ADDRESS:
P.O. Box 1049
Columbus, OH 43216-1049

June 10, 1997

RE: Fields Brook
Sediment Operable Unit
Ohio EPA ID# 204-0300
Ashtabula County

RECEIVED
JUN 12 1997
U.S. EPA REGION
OFFICE OF REGIONAL ADMINISTRATOR

Valdas V. Adamkus
Regional Director
USEPA Region V
77 West Jackson Blvd.
Chicago, IL 60604

Dear Mr. Adamkus:

This letter is in regard to the Explanation of Significant Differences (ESD) issued for the Fields Brook Superfund Site, Sediment Operable Unit (SOU) in Ashtabula, Ohio. As you know, Ohio EPA has made an effort to reduce duplicative efforts by state and federal agencies on certain Superfund Sites in Ohio. As such, we have not been providing technical support and oversight assistance to USEPA for the Fields Brook Site for the past year. The State of Ohio did, however, concur with the original 1986 Record of Decision for the SOU and accordingly we welcome the opportunity to provide comments on the ESD. Our specific comments are detailed below.

State of Ohio Comments on the Explanation of Significant Differences for the Sediment Operable Unit of the Fields Brook Superfund Site, Ashtabula, Ohio

1. Paragraph 1 on page 1. Ohio EPA is no longer acting as a support agency for this project.

2. Page 6 under Section III, Significant Differences. The 1986 ROD specifies construction of a RCRA/TSCA landfill with separate cells for solidified sediments. It is not our present understanding that USEPA or the FBAG intends to construct a RCRA/TSCA landfill. Off-Site disposal was considered likely for the last few years because the volume estimates dropped from 52,000 cu. yd. to 14,000 cu.yd. due to changes in the Cleanup Goals (CUGs), statistical application of the CUGs by averaging over the exposure units and by limiting the depth of excavation in most areas to 2 feet. Recently the On-Site option was reconsidered for disposal of the brook sediments and the sediment/soil from the Floodplain/Wetland Area. This facility would not be a

RCRA/TSCA landfill but rather a modified design in terms of bottom liner and cap requirements. There is no mention of this modified landfill design in this ESD. If the proposed facility is to be anything less than a RCRA/TSCA landfill that meets ARARs the differences should be included in this ESD.

3. Page 12, item 3. The first paragraph under item 3 states that CUGs would be the concentrations of contaminants in the sediments which must be excavated. This is usually true but USEPA is allowing the use of the confidence removal goal (CRG) approach in this case. The CRG method is a statistical approach to arriving at the CUG on average over a given exposure unit. The sediment concentration that determines where sediment is removed is the CRG, not the CUG. The CUG will be the post excavation surface weighted average concentration. The CRG will be different for each exposure unit and will always be higher (in this case up to 7 times higher) than the CUG. This is a significant departure from using the CUG to determine where cut lines are drawn (as USEPA originally intended to do) and is a major reason for the reduction in sediment volume from 52,000 to 14,000 cu. yd.

4. Page 13, second paragraph. USEPA states that the CUGs were developed in coordination with Ohio EPA after discussions with FBAG. It should be noted that Ohio EPA does not agree with the CUGs finally agreed upon between USEPA and FBAG due to differences of opinion over appropriate exposure frequencies.

5. Page 18 last paragraph and page 19, first paragraph. It states that a Focused Ecological Risk Assessment was done regarding the need to be protective of ecological receptors at the Site in developing the SOU PCB CUGs. It further states that USEPA believes that a remedy which meets the PCB CUGs would protect the various populations of ecological receptors which may exist within the Brook. The ecological risk assessment was not considered in developing the SOU CUGs; this document was produced after the CUGs were negotiated and, in fact, concludes that there are post remediation Hazard Quotients in exceedance of 1 for several species. In addition, a full biological sampling and assessment of the SOU was never done. The State of Ohio, as a natural resource trustee, is concerned that the SOU remedy may not be protective of ecological receptors and intends to conduct post remediation biomonitoring to assess the extent to which injuries to the natural resources continue to occur.

Please feel free to contact Ohio EPA should you have any questions or concerns about this letter.

Sincerely,

Donald R. Schregardus
Director
Ohio Environmental Protection Agency

DRS/RSW.wmk

cc: Jenny Tiell, Deputy Director, CO
Jan Carlson, DERR, CO
Mike Czeczele, DERR, CO
Ray Beaumier, DERR, CO
Bill Skowronski, District Chief, NEDO
Bob Wysenski, Assistant District Chief, NEDO
Rod Beals, DERR, NEDO
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Heidi Sorin, DERR, CO
Jeff Hurdley, Legal, CO
Vanessa Steigerwald, DERR, CO
Peter Whitehouse, DERR, CO
Tim Kern, Ohio AGO

APPENDIX 2

U.S. EPA's RESPONSES TO COMMENTS
FROM THE
STATE OF OHIO

APPENDIX 2

U.S. EPA's RESPONSES TO COMMENTS FROM THE STATE OF OHIO

ON THE EXPLANATION OF SIGNIFICANT DIFFERENCES

FOR THE SEDIMENT OPERABLE UNIT FIELDS BROOK SITE, ASHTABULA OHIO

PURPOSE

This document summarizes written comments received from the Ohio Environmental Protection Agency (OEPA) on its review of the draft Explanation of Significant Differences. OEPA's comments are, as follows:

Comment 1: OEPA is no longer acting as a support agency for this project.
Response: The text of the ESD was revised to clarify OEPA's role.

Comment 2: The landfill to be built on site would not meet the requirements of RCRA and TSCA. The ESD does not describe the landfill design and identify ARARs that will not be met.
Response: The ESD was modified based on this OEPA comment. A fifth "difference" was added to clarify ARARs that would not be met. Specifically, the landfill to be constructed pursuant to the Floodplain/Wetland ROD (6/30/97) would not meet Section 761.75(b)(3) of TSCA, which specifies a fifty foot distance between the bottom liner and the historical high water table.

Comment 3: The ESD does not describe how Confidence Removal Goals (CRGs) would be used to meet CUGs, on average, within an exposure area.
Response: The ESD was modified to include a discussion of CRGs.

Comment 4: OEPA does not agree with CUGs and the exposure frequencies upon which they are based.
Response: The ESD was modified to include a statement of OEPA's position concerning the the exposure frequencies and the CUGs.

Comment 5: OEPA notes that a full biological sampling and assessment of the Sediment Operable Unit never done. The Focused *Ecological* Risk Assessment was developed after the CUGs were finalized. There are post-remediation

Hazard Quotients in exceedance of 1 for several species. The State of Ohio is concerned that the Sediment Operable Unit remedy may not be protective of ecological receptors and will conduct post-remediation biomonitoring to assess the extent to which injuries continue to occur.

Response: U.S. EPA acknowledges that it did not perform a full biological assessment of the Sediment Operable Unit and that the Focused Ecological Risk Assessment was prepared after the CUGs were developed. According to the Focused Ecological Risk Assessment, there are post-remediation Hazard Quotients exceeding 1. However, as discussed in the ESD text on page 14, U.S. EPA believes that the remedy will be protective. The response actions will reduce the short- and long-term risks to ecological populations and reduce these population's potential uptake of contamination via soil and food to acceptable levels of exposure. U.S. EPA supports OEPA's decision to perform post-remediation biomonitoring.

APPENDIX 3

CLEANUP GOALS (CUGs)

TABLE 2.5.0
CLEANUP GOALS
SEDIMENT OPERABLE UNIT - FIELDS BROOK SITE
ASHTABULA, OHIO

Woodward-Clyde

	(mg/kg)	(mg/kg)	
Chemical of Concern	**Residential**	**Occupational**	
1,1,1-Trichloroethane	393,451.00	766,500.00	
1,1,2,2-Tetrachloroethane	51.00	119.00	
1,1,2-Trichloroethane	179.00	418.00	
1,1-Dichloroethene	17.00	40.00	
1,2,4-Trichlorobenzene	43,717.00	85,167.00	
1,2-Dichlorobenzene	393,451.00	766,500.00	
1,2-Dichloroethene (trans)	87,433.00	170,333.00	
1,4-Dichlorobenzene	425.00	994.00	
2-Chlorophenol	21,858.00	42,583.00	
Acenaphthene	262,300.00	511,000.00	
Anthracene	1,311,502.00	2,555,000.00	**
Antimony	1,749.00	3,407.00	
Arsenic*	5.80	14.00	
Benzene	352.00	822.00	
Benzidine	0.04	0.10	
Benzo(a)anthracene	13.97	33.00	
Benzo(a)pyrene	1.40	3.30	
Benzo(b)fluoranthene	13.97	33.00	
Benzo(k)fluoranthene	13.97	33.00	
Beryllium	2.40	5.50	
Alpha-BHC	1.60	3.80	
Gama BHC (Lindane)	7.80	18.00	
Bis(2-ethylhexyl)phthalate	729.00	1,703.00	
Cadmium	2,186.00	4,258.00	
Chlorobenzene	87,433.00	170,333.00	
Chloroform	1,672.00	3,909.00	
Chromium III	4,371,673.00	8,516,667.00	**
Chromium VI	21,858.00	42,583.00	
Chrysene	139.73	327.00	
Copper	161,752.00	315,117.00	
Cyanide	87,433.00	170,333.00	
Di-n-butylphthalate	437,167.00	851,667.00	
Di-n-octylphthalate	87,433.00	170,333.00	
Dibenz(a,h)anthracene	1.40	3.30	
Diethyl phthalate	3,497,338.00	6,813,333.00	**
Dimethyl phthalate	437,167.00	851,667.00	
Ethylbenzene	437,167.00	851,667.00	
Fluoranthene	174,867.00	340,667.00	
Fluorene	174,867.00	340,667.00	
Heptachlor	2.30	5.30	
Hexachlorobenzene (p)	6.38	15.00	
Hexachlorobenzene (s)	6.38	15.00	

TABLE 2.5.0
CLEANUP GOALS
SEDIMENT OPERABLE UNIT - FIELDS BROOK SITE
ASHTABULA, OHIO

Woodward-Clyde

Chemical of Concern	Residential (mg/kg)	Occupational (mg/kg)	
Hexachlorobutadiene	131.00	306.00	
Hexachloroethane	729.00	1,703.00	
Indeno(1,2,3-cd)pyrene	14.00	33.00	
Isophorone	10,737.00	25,102.00	
Lead	500.00	500.00	
Mercury	1,312.00	2,555.00	
Methylene chloride	1,360.00	3,180.00	
N-nitrosodiphenylamine	2,081.75	4,867.00	
Naphthalene	174,867.00	340,667.00	
Nickel	87,433.00	170,333.00	
Nitrobenzene	2,186.00	4,258.00	
Total PCB	1.30	3.10	
Phenol	2,623,004.00	5,110,000.00	**
Pyrene	1,311,502.00	2,555,000.00	**
Selenium	21,858.00	42,583.00	
Tetrachloroethene	196.00	459.00	
Thallium	262.00	511.00	
Toluene	874,335.00	1,703,333.00	**
Trichloroethene	927.00	2,168.00	
Vinyl Chloride	5.40	13.00	
Zinc	847,335.00	1,703,333.00	**
Radionuclides			
Uranium (soluble salts) in mg/kg	11,000.00	26,000,000.00	**
Uranium - 234 in pCi/kg	668.00	817.00	
Uranium - 235 + D in pCi/kg	5.00	5.00	
Uranium - 238 + D in pCi/kg	31.00	32.00	
Technetium - 99 in pCi/kg	8,326.00	10,206.00	

Notes:
- The CUG for arsenic has been replaced with the background concentration (*).
- Results for several compounds are greater than 1 million parts per million (**).
 assumptions provided by USEPA.