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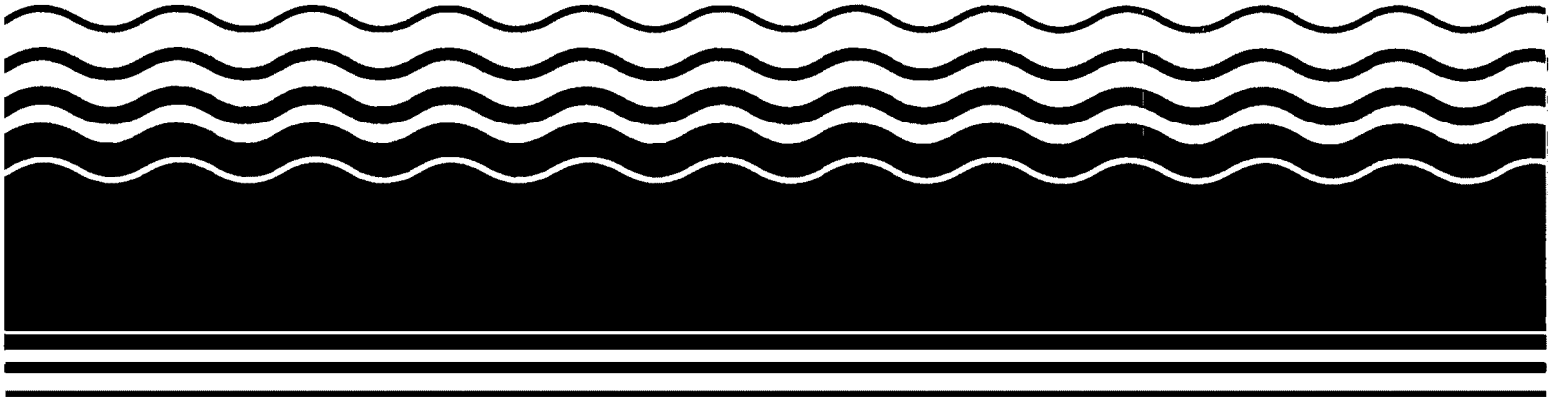
EPA Superfund
Record of Decision Amendment:

Tyson Dump, Superfund Site
Upper Merion Township, PA
7/20/1996



RECORD OF DECISION AMENDMENT
TYSONS SUPERFUND SITE
MONTGOMERY COUNTY, PENNSYLVANIA

DECLARATION

SITE NAME AND LOCATION

Tyson's Superfund Site
Upper Merion Township, Montgomery County, Pennsylvania

STATEMENT OF BASIS AND PURPOSE

This Record of Decision Amendment ("ROD Amendment")modifies the selected remedy described in the Revised Record of Decision for the Tyson's Superfund Site ("Site") issued by the U.S. Environmental Protection Agency ("EPA") on March 31, 1988 ("1988 Revised ROD"). In the 1988 Revised ROD, EPA selected a soil vapor extracton ("SVE") remedy for lagoon area soils. The SVE system has removed approximately 200,000 pounds of volatile organic compounds ("VOCs") from the lagoon area soils. However, SVE performance has been limited by various factors which have contributed to declining VOC removal rates. Although several enhancements and modifications have been employed to improve performance, the SVE system will not achieve the cleanup standards specified in the 1988 Revised ROD. This decision document presents the selected remedial action for the lagoon area soils at the Tyson's Site. The selected remedial action was chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 as amended, ("CERCLA") and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan ("NCP").

This decision is based on the Administrative Record for the Site.

The Commonwealth of Pennsylvania concurs with the selected remedy for the Tyson's Superfund Site described in this ROD Amendment.

ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from this Site, if not addressed by implementing the response action selected in this ROD Amendment, may present an imminent and substantial endangerment to public health, welfare, or the environment.

DESCRIPTION OF THE SELECTED REMEDY

This response action addresses contaminated lagoon area soils at the Tyson's Site. The 1988 Revised ROD addressed the lagoon area soils by using an innovative technology, namely soil vacuum extraction. That remedy did not achieve the cleanup standards specified in the 1988 Revised ROD.

At the Tysons Site, the lagoon area soils present a principal threat to human health through the direct contact and inhalation pathways. EPA therefore plans to mitigate these potential threats by placing a wet soil cover over the lagoon area soils.

The selected remedy includes the following major components:

* Installation of a contingent vent layer consisting of a high permeability layer for grading of the site and control of lateral migration of vapors.

* Installation of a low permeability barrier layer covering the vent layer which will maintain nearly saturated conditions to control and virtually eliminate upward migration of vapors. This barrier would become nearly saturated through natural precipitation and suface irrigation.

* Installation of a vegetated cover layer.

* Installation of a surface irrigation system.

* Continued operation of the existing french drain, seep sump pumps, and groundwater well pumps.

* Installation of vent pipes as necessary.

STATUTORY DETERMINATIONS

The selected remedy is protective of human health and the environment, complies with Federal and State requirements that are legally applicable or relevant and appropriate, and is cost effective. This remedy utilizes permanent solutions and alternative treatment (or resource recovery) technology to the extent practicable, and satisfies the statutory preference for remedies that employ treatment that reduces toxicity, mobility, or volume as a principal element.

Thomas C. Voltaggio, Director
Hazardous Waste Management Division
U.S. EPA, Region III

7/25/96
Date

DECISION SUMMARY
TYSON'S SUPERFUND SITE

INTRODUCTION

Tyson's Dump Site is an abandoned septic waste amd chemical waste disposal site located in Upper Merion Township, Montgomery County, Pennsylvania. Several unlined lagoons were used to dispose of septic and chemical wastes during the period of operation. The U.S. Environmental Protection Agency ("EPA"), following consultation with the Pennsylvania Department of Environmental Protection ("PADEP"), is issuing this Record of Decision Amendment ("ROD Amendment") to address contaminated soil at the site. The selected remedy described in this ROD Amendment was chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986, U.S.C. §§ 9601 et al. ("CERCLA"), and the National Oil and Hazardous Substances Pollution Contingency Plan ("NCP").

In 1984 EPA issued a Record of Decision (ROD) for the excavation and off-site disposal of contaminated soils at the Tyson's Site. Before the 1984 ROD was implemented, a Revised ROD was issued on March 31, 1988 ("1988 Revised ROD"). This ROD Amendment modifies the selected remedy described in the 1988 Revised ROD. In the 1988 Revised ROD, EPA selected a soil vapor extraction ("SVE") remedy for lagoon area soils. The 1988 Revised ROD also specified the installation of a groundwater recovery and treatment system to prevent site-related compounds in the groundwater from entering the Schuylkill River. The Responsible Parties ("RPs") signed a Consent Decree ("CD") with EPA on June 20, 1988 to implement the 1988 Revised ROD. An SVE system was designed and constructed during the Spring and Summer of 1988 and full scale operation of this system began in November, 1988. Since then, the SVE system has removed approximately 200,000 pounds of volatile organic compounds ("VOCs") from the lagoon area soils. However, SVE performance has been limited by low contaminant volatility, soil heterogeneity, soil moisture and low soil temperature which have contributed to declining VOC removal rates. Although several enhancements and modifications have been employed to improve performance, the SVE system has reached a low asymptotic limit of mass removal and will not achieve the cleanup standards specified in the 1988 ROD in a timely or cost-effective manner. In accordance with the CD, a Focussed Feasibility Study ("FFS") was conducted to identify an alternative remedial action for the lagoon area soils. This ROD Amendment addresses lagoon area soil contamination not fully remediated by the 1988 Revised ROD. This ROD Amendment does not modify the 1988 ROD with respect to the groundwater recovery and treatment system.

In accordance with Section 117 of CERCLA, 42 U.S.C. § 117, the FFS, Proposed Plan, and background documentation for the

Tyson Site were made available to the public on February 20, 1996 in the local information and administrative record repository at the Upper Merion Township Municipal Building, Upper Merion Township, Pennsylvania. In accordance with Section 300.825 (a) (2) of the NCP, this ROD Amendment will become part of the Administrative Record File. The Administrative Record File is available for review at the following locations:

Upper Merion Township Building	U.S. EPA Region III
175 West Valley Forge Road	841 Chestnut Bldg.
King of Prussia, Pennsylvania 19406	Philadelphia, PA 19107

For a detailed description of the Site background and Site characteristics, refer to the 1988 ROD, the July 14, 1995 FFS, and the Proposed Plan dated January 31, 1996 for this ROD Amendment.

REASONS FOR ISSUING THE ROD AMENDMENT

As described above, the remedy selected in the 1988 Revised ROD was soil vacumm extraction for the lagoon area soils and groundwater recovery and treatment to prevent the discharge of contaminated groundwater from entering the Schuylkill River. The clean-up levels identified in the 1988 Revised ROD for the lagoon area soils were 50 parts per billion (ppb) for 4 indicator compounds, namely 1,2,3-trichloropropane, benzene, trichloroethene and tetrachloroethene. Between 1988 and the present, the SVE system was installed, modified and enhanced and resulted in the removal of nearly 200,000 pounds of VOCs. The current levels of these compounds in the lagoon area soils range from 10 parts per million (ppm) in the upper 2 feet to 10,000 ppm in the deeper soils. Beginning in 1993 the ability of the SVE system to efficiently remove the remaining contaminants has decreased significantly. As a result the SVE system is incapable of achieving the clean-up levels set forth in the 1988 Revised ROD in a timely and cost effective manner. Therefore, EPA determined that an alternative remedial action for the lagoon area soils would be necessary to address the VOC contamination remaining in these soils.

As required by Section VIII. C. 2. of the 1988 CD, the Settling Defendants were to propose an alternate remedial action to EPA if it were determined by EPA that excavation of greater than ten percent of the volumetric area of soils in the Lagoon Area was necessary to achieve the clean-up levels. In 1993, EPA and the RPs determined that the SVE technology would not be able to achieve the clean-up levels. As a result, EPA directed the RPs to conduct a Focused Feasibility Study to identify an alternate remedial action with respect to contaminated soils in the Lagoon Area. The FFS identified and evaluated alternatives

for remedial action to prevent, mitigate, contain, or otherwise remedy the release of hazardous substances from the Lagoon Area Soils.

DESCRIPTION OF THE NEW ALTERNATIVES

CERCLA and the NCP require that the alternative chosen to clean up a hazardous waste site meet several criteria. The alternative must protect human health and the environment, meet the requirements of environmental laws and regulations, and be cost-effective. Permanent solutions to contamination problems should be developed wherever possible. The solutions should reduce the volume, toxicity, or mobility of the contaminants. Emphasis is also placed on treating the waters at the site, whenever this is possible, and on applying innovative technologies to clean up the contaminants.

In accordance with Section 300.430 of the NCP, a list of remedial response actions and representative technologies were screened to meet the remedial action objectives at the Tysons Site. The FFS studied a variety of technologies to determine if they could address the lagoon area soil contamination at the Tysons Site. The technologies determined to be most applicable to the contaminants and contaminated soils were developed into remedial alternatives. In addition, EPA has evaluated the No Action Alternative (Alternative 1) as required by the NCP. The alternatives are presented and discussed below. All costs and implementation time frames provided for the alternatives below are estimates.

Original Alternative - Soil Vacuum Extraction

The vacuum extraction process is an in-situ treatment process used to clean soils that contain volatile compounds. The process utilizes extraction wells to induce a vacuum on subsurface soils that are above the water table. Subsurface vacuum spreads laterally, causing in-situ volatilization of compounds adsorbed to the soils. Volatilized compounds and subsurface air migrate rapidly to extraction points and are then passed through and collected on activated carbon.

Total Estimated Costs: (From 3/31/88 ROD)	**$ 10.2 million**
Total SVE Costs to date (From 3/31/88 ROD)	**$ 43.4 million**

No Action Alternative

The Superfund program is required to evaluate the "No Action" Alternative. Under this alternative, no additional remedial action, beyond the SVE activities initiated under the 1988 ROD for OU-1, would be taken to reduce the amount of VOCs in the lagoon area soils. The SVE system would be completely shutdown and dismantled. This alternative would be selected only if the Site posed little or no risk to public health or the environment from hazardous substances left on-site.

Alternative 1: Soil Cover

This alternative consists of covering the lagoon area soils with an 18-inch to 24-inch-thick vegetated soil cover. The soil cover (from the top to bottom) would include a 6-inch vegetated topsoil layer and a 12 to 18-inch cover layer of imported general fill soil. Previous characterization activities for the lagoon area soils indicate that the total area to be covered is approximately 2.5 acres. Surface water control measures for the cover would include a sloped surface leading to perimeter drainage swales and sediment basins as necessary. An irrigation system would be included as necessary to maintain the vegetative cover. Institutional controls would include upgrading and extending as necessary the perimeter security fence to further restrict unauthorized site access. Deed restrictions and easement agreements will provide for long-term control of the Site, as required, to minimize potential future risks and to provide for the maintenance and implementation of required remedial activities.

Short-term risks associated with this alternative are less than $1x10^{-6}$, as only minor disturbance and covering of contaminated soils are required, and because the time required for implementation is relatively short. Although the soil cover does not completely control VOC emissions, it does prevent potential direct contact and ingestion exposure risks and erosion of contaminated soil. As a result, the estimated total carcinogenic risk associated with this alternative is less than $8x10^{-5}$ for all receptors.

Capital Costs:	**$ 812,000 to 1,073,000**
Annual O&M Cost:	**$ 42,000**
Present Worth:	**$1,528,000 to 1,788,000**
Estimated Time To Implement:	**18 Months**

Alternative 2: Capping

This alternative consists of covering the lagoon area soils with a cap that includes a 2-foot-thick clay layer and a vegetative soil layer to restrict VOC emissions. The cap (from the top to bottom) would include a 6-inch vegetated topsoil layer, a 12 to 18-inch compacted cover soil layer and a 24-inch compacted clay layer. Previous characterization activities indicate that the area to be covered is approximately 2.5 acres. To maximize the reduction of VOC emissions, the clay layer would be compacted to a relatively high density and high moisture content so as to minimize the total air porosity. An irrigation system would be included as necessary to maintain the vegetative cover and high moisture content within the clay layer. Surface water control measures for the cap would include a sloped surface leading to perimeter drainage swales and sediment basins as necessary. Institutional controls would include upgrading and extending, as necessary, the perimeter security fence to further restrict unauthorized site access. Deed restrictions and easement agreements will provide for long-term control of the Site, as required, to minimize potential future risks and to provide for the maintenance of required remedial activities.

Short-term risks associated with this alternative are less than $1x10^{-6}$, as only minor regrading and covering of contaminated soils are required and because the required implementation time is relatively short. This alternative will prevent direct contact and ingestion exposure risk from the contaminated lagoon area soils and will effectively reduce VOC vapor emissions, thereby reducing the inhalation exposure risk. As a result, the total estimated carcinogenic risk for this alternative is $1x10^{-5}$, which is within EPA's target risk range. If it is determined that the residual risks associated with this alternative are not acceptable, the clay cap can be constructed with a granular venting layer beneath the clay layer to provide for the active venting of VOC's beneath the cap. The estimated carcinogenic risk for this alternative (with venting) is $6x10^{-7}$ for all receptors.

Capital Costs:	**$1,218,000 to 1,614,000**
Annual O&M Costs:	**$ 48,000**
Present Worth:	**$2,350,000 to 2,746,000**
Estimated Time To Implement:	**20 Months**

Alternative 3: Wet Soil Cover

This alternative consists of a low permeability barrier layer which will maintain nearly saturated conditions as a result of natural precipitation and surface irrigation. The wet soil cover (from top to bottom) would include a vegetated cover layer, a low permeability barrier layer and a contingent vent layer. Water introduced to the vegetated cover layer through precipitation and irrigation is expected to nearly saturate the low permeability layer to create a wet soil layer. Water would percolate through the wet soil layer into the lower layers of the lagoon area soils to control and virtually eliminate upward migration of VOC vapors. The contingent vent layer consists of a high permeability layer for grading of the site and control of lateral migration of vapors, if necessary. Additional water may be added, as needed, which will combine with the natural groundwater beneath the lagoon area. The shallow groundwater flows to the existing french drain along the northern edge of the lagoon area and deeper groundwater flows to the existing groundwater recovery and treatment system. The operation of the french drain, seep sump pumps and groundwater well pumps would continue to operate as part of this remedy.

Institutional controls would include upgrading and extending, as necessary, the perimeter security fence to further restrict unauthorized site access. Deed restrictions and easement agreements will provide for long-term control of the Site, as required, to minimize potential future risks and to provide for the maintenance and implementation of required remedial activities.

Short term risks associated with this alternative are less than $1x10^{-6}$, as only minor disturbance of the surface soil is expected for site grading and wet soil construction and because the implementation time is short. This alternative will prevent direct contact and ingestion exposure risks from the contaminated lagoon area soils and will effectively eliminate VOC vapor emissions, thereby eliminating inhalation exposure risks. As a result, the total carcinogenic risk estimated for this alternative is less than $4x10^{-7}$ for all receptors.

Capital Costs:	**$1,098,000 to 1,505,000**
Annual O&M Costs:	**$ 60,000**
Present Worth:	**$2,090,000 to 2,497,000**
Estimated Time To Implement:	**20 Months**

Alternative 4: Low Temperature Thermal Desorption (LTTD)

This alternative includes excavation of the lagoon area soils, on-site treatment of excavated soil by low temperature thermal desorption (LTTD), backfilling the excavated area with treated soil and installation of a soil cover. A pilot test of the LTTD process would be conducted to provide the necessary evaluation and design data. Excavation and treatment includes those soils with total average VOC concentrations in excess of 1,000 mg/kg (about 13,070 cubic yards or 19,600 wet tons). An LTTD unit using indirect heating of the lagoon area soils would be used for evaluation of this alternative. However, there are a number of available commercial LTTD processes, and the selection of the most appropriate equipment would be made during remedial design.

Site disturbance associated with soil excavation and feed preparation is a source of fugitive dust and increased VOC emissions. The short-term carcinogenic risks associated with this alternative is less than $4x10^{-5}$. This alternative would prevent direct exposures and will result in reduced VOC emissions. Immediately after treatment and backfilling, the overall reduction of soil VOC concentrations would be more than 99% for the treated soils. However, the clean backfilled soil would be recontaminated by diffusion of VOC vapors from the inaccessable DNAPL sources remaining in the bedrock upward through the backfilled soils, resulting in VOC emissions to the atmosphere. Although the levels of this recontamination would, over time, be much lower than the current concentrations, the effects of this recontamination will partially offset the VOC mass removal achieved by soil treatment. The total carcinogenic risks estimated for this alternative are less than $7x10^{-5}$ for all receptors.

Capital Costs:	**$7,135,000 to 9,293,000**
Annual O&M Costs:	**$ 42,000**
Present Worth:	**$7,851,000 to 10,008,000**
Estimated Time To Implement:	**38 Months**

Alternative 5: Off-Site Incineration/Disposal

This alternative includes excavation of lagoon area soils, transportation of excavated soil by rail to an off-site facility, off-site incineration/disposal, backfilling the excavation area with imported soil, and installation of a soil cover. Soils with

average total VOC concentrations in excess of 1,000 mg/kg (about 13,070 cubic yards or 19,600 wet tons) would be excavated for off-site incineration/disposal. The actual facility to be used for incineration/disposal would be selected during the design and bidding phase of the project. Because the site is located adjacent to Conrail's Abrams switchyard, shipping of excavated soils via rail using available Conrail facilities is feasible.

On-site activities required for implementation of this alternative are estimated to take 8 to 10 months. Emissions from soil processing and loading operations would be captured under an enclosure. Soil excavation would include appropriate measures to control vapor emissions from the open excavation. The short-term carcinogenic risk associated with this alternative is less than $4x10^{-5}$. After implementation of this alternative, the backfilled soil would not contain any hazardous organic chemicals, thereby reducing VOC emissions and eliminating direct contact and ingestion risks from the areas of excavation and backfilling. However, the clean backfilled soil would be recontaminated via vapor-phase migration which partially offsets the risk reduction gained by soil removal and treatment. The total carcinogenic risk associated with this alternative is less than $6x10^{-5}$.

Capitol Costs:	**$21,084,000 to 25,919,000**
Annual O&M Costs:	**$ 42,000**
Present Worth:	**$21,799,000 to 26,634,000**
Estimated Time To Implement:	**31 Months**

EVALUATION OF ALTERNATIVES

In evaluating remedial alternatives for Superfund Sites, EPA considers nine specific criteria (see Table 1). These nine criteria are categorized into the following three groups:

Threshold Criteria

Overall protection of human health and the environment

Compliance with applicable or relevant and appropriate requirements (ARARs)

Primary Balancing Criteria

Reduction of toxicity, mobility, or volume through treatment

TABLE 1

DESCRIPTION OF EVALUATION CRITERIA

Overall protection of human health and the environment - Addresses whether a remedy provides adequate protection and describes how risks posed through each pathway are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

Compliance with applicable or relevant and appropriate requirements (ARARs) - Addresses whether a remedy will meet all of the ARARs of other Federal and State environmental laws and/or justifies a waiver.

Long-term effectiveness and permanence - Addresses expected residual risk and the ability of a remedy to maintain reliable protection of human health and the environment over time, once cleanup goals have been met.

Reduction of toxicity, mobility, or volume through treatment - Addresses the anticipated performance of the treatment technologies a remedy may employ.

Short-term effectiveness - Addresses the period of time needed to achieve protection and any adverse impacts on human health and the environment that may be posed during the construction and implementation period, until cleanup goals are achieved.

Implementability - Addresses the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement a particular option.

Cost - Includes estimated capital and operation and maintenance costs, as well as present worth costs.

State/Support Agency Acceptance - Indicates the support agency's comments. Where the State or Federal agency is the lead for the ROD, EPA's acceptance of the selected remedy is addressed under this criterion.

Community Acceptance - Summarizes the public's general response to the alternatives described in the Proposed Plan and Remedial Investigation/Feasibility Study Report. The specific responses to public comments are addressed in the Responsiveness Summary section of the Record of Decision.

Short-term effectiveness

Long-term effectiveness and permanence

Implementability

Cost

Modifying Criteria

Community acceptance

State acceptance

These evaluation criteria relate directly to requirements of Section 121 of CERCLA, 42 U.S.C. § 9621, for determining the overall feasibility and acceptability of a remedy. Threshold criteria must be satisfied in order for a remedy to be eligible for selection. Primary balancing criteria are used to weigh major trade-offs between remedies. The modifying criteria are formally taken into account after public comment is received on the Proposed Plan.

The following paragraphs summarize how the new alternatives, including the selected alternative for the Tysons Site, compare to each other with respect to the nine criteria.

Overall Protection of Human Health and the Environment

Each of the remedial alternatives generally meet the established remedial action objectives, and achieve carcinogenic risks within or below EPA's target risk range (i.e., $1x10^{-4}$ to $1x10^{-6}$. By effectively controlling VOC emissions and direct contact exposures, the Capping and Wet Soil Cover alternatives achieve the greatest overall protection to human health and the environment.

Compliance with Applicable or Relavent and Appropriate Requirements (ARARs)

CERCLA requires that remedial actions meet ARARs of other federal and state environmental laws, or that there be grounds for invoking a waiver. A "legally applicable" requirement is one which would legally apply to the response action if that action were not taken pursuant to Sections 104, 106, or 122 of CERCLA. A "relevant and appropriate" requirement is one that, while not "applicable", is designed to apply to problems sufficiently similar that their application is appropriate.

The alternative remedies considered herein are not inconsistent with the remedial actions taken pursuant to the RODs

dated March 31, 1988, September 30, 1988 and September 28, 1990, to the extent that the previous RODs provided for the installation and operation of a groundwater extraction and treatment system. The selected remedy is designed to work in conjunction with the above referenced groundwater extraction system. Accordingly, all the remedial alternatives discussed in this ROD Amendment, including the selected alternative, will comply with all ARARs including the ARARs identified and discussed in the aforementioned RODs. The potential Federal and State ARARs for this ROD Amendment are presented in table 2.

There are no additional chemical-specific or location-specific ARAR's of concern identified. Also, all alternatives include the appropriate measures to ensure that all action-specific ARAR's are satisfied. Thus, all remedial alternatives considered in this ROD Amendment will comply with all ARAR's.

Long Term Effectiveness and Permanence

Each of the alternatives discussed above will be effective for as long as the remedial components are maintained. The Soil Cover alternative requires minimal maintenance and allows for natural attenuation of contaminants from the lagoon area soils, but is less effective at controlling long-term VOC emissions than other alternatives. The Capping alternative is expected to provide a high degree of overall long-term effectiveness due to the ability of the clay barrier to restrict VOC emissions, and the minimal maintenance requirements. The Wet Soil Cover alternative provides for effective long-term VOC emission control and enhanced natural attenuation of contaminants, although operation and maintenance requirements are greater than for the Soil Cover or Capping alternatives. The LTTD and Off-Site Incineration/Disposal alternatives will result in permanent destruction of the VOC mass from the unsaturated lagoon area soils, but risk reduction will be partially offset by recontamination.

Reduction of Toxicity, Mobility or Volume

Operation of the SVE system over the past six years has removed approximately 200,000 pounds of VOCs from the lagoon area soils. The Soil Cover and Capping alternatives provide little additional reduction in toxicity or volume. Reduction in mobility is achieved by reducing VOC emissions and erosion of contaminated soils. The Capping alternative reduces surface water infiltration and subsequent contaminant leaching, and is more effective at restricting VOC emissions than the Soil Cover alternative. The Wet Soil Cover alternative effectively controls VOC vapor emissions, and reduces toxicity and volume through enhanced natural attenuation. By eliminating VOC emissions, the Wet Soil Cover also prevents contamination of the cover soils. The LTTD and Off-Site Incineration/Disposal alternatives provide

Table 2 - Potential Action-Specific ARARS

Federal Action Specific ARARs

Citation	Requirement	Status
* 40 CFR §264.14	Security requirements will be followed through completion of the construction of the cap	Relevant & Appropriate
* 40 CFR §264.97 and §264.98	Groundwater monitoring requirements	Relevant & Appropriate
* 40 CFR §§264.111-.112, 264.114, 264.117-118	Hazardous waste landfill regulations concerning closure and post-closure activities	Relevant & Appropriate
* 40 CFR §264.302 and 40 CFR §264.310	Cap construction and operation Cap design requirements	Relevant & Appropriate
40 CFR §258.60	Long-term monitoring requirements	Relevant & Appropriate
Oswer Directive 9335.4-01	This is not an ARAR but a TBC (to be considered) that will be met by this remedy and which directs action toward containment remedial actions	

* State requirements, as authorized pursuant to RCRA, are ARARs. These United States counterparts are cited for convenience.

Table 2 - Potential Action-Specific ARARs (Cont'd)

Pennsylvania Action-Specific ARARs

Citation	Requirement	Status
Pennsylvania Air Pollution Regulations 25 Pa. Code §§123.1, 123.2	Regulates fugitive air emissions for remedial actions	Applicable
25 Pa. Code, §102.4	The substantive requirements for control of soil erosion/ sedimentation resulting from earth moving activities	Applicable
25 Pa. Code §75.264 (d), (n), (o), (s)	Substantive requirements as set forth in Pa. Bull., Vol. 12, No.36 Saturday September 4, 1982 as those provisions are amended in Pa. Bull. Vol. 15, No. 37, Saturday, September 14, 1985, and Pa. Bull. Vol. 15, No. 22, Saturday, June 1, 1985 for security, operations, and post-closure	Applicable

immediate reduction of toxicity and volume through treatment, although VOC vapor migration will result in contamination of the backfilled soils. Additionally, the VOC mass reduction for the LTTD and Off-Site Incineration/Disposal alternatives is only a small percentage of the total VOC mass at the Site.

Short-term Effectiveness

The Soil Cover, Capping and Wet Soil Cover alternatives provide the highest level of short-term effectiveness because they can be constructed in a relatively short period of time, the short term risks are minimal, and the benefits will be realized immediately. The short term effectiveness of the LTTD and Off-Site Incineration/Disposal alternatives is less than that of the other alternatives because of the significant soil disturbances, VOC emissions generated and associated risks, the significant health and safety requirements, and the longer implementation schedules associated with the LTTD and the Off-Site Incineration/Disposal alternative.

Implementability

The Soil Cover, Capping and Wet Soil Cover alternatives involve the use of available construction materials, equipment and approaches, and can be easily and quickly implemented. The LTTD and Off-Site Incineration/Disposal alternatives are moderately difficult to implement because significant volume of material must be excavated, associated engineering and health and safety controls are required, specialized equipment, materials and approvals are needed and the proximity of a residential neighborhood. In addition, Off-Site Incineration/Disposal will require coordination with rail shipping concerns. A pilot study is required for LTTD prior to design activities to verify process effectiveness.

Cost

The present worth cost for the Preferred Alternative is $2,090,000 to $2,497,000, which is considerably less than the cost for LTTD ($7,851,000 to $10,008,000) and Off-Site Incineration/Disposal ($21,799,000 to 26,634,000).

State Acceptance

The Commonwealth of Pennsylvania has verbally concurred with the selected remedy described in this ROD Amendment.

Community Acceptance

A public meeting on the Proposed Plan was held on February 20, 1996 in Upper Merion Township, Pennsylvania. Citizens who attended the meeting did not voice any significant concerns about

the preferred alternative. Community acceptance is more fully assessed in the attached Responsiveness Summary, which provides a thorough review of the public comments received on the FFS and Proposed Plan, and EPA's responses to the comments received.

SELECTED REMEDY

After carefully considering the requirements of CERCLA, the findings of the FFS, the detailed analysis of the alternatives, public comments, and other documents contained in the Administrative Record, EPA has selected Alternative 3, Wet Soil Cover, as the remedy for amending the 1988 Revised ROD with respect to the Lagoon Area Soils at the Tysons Site.

DESCRIPTION OF THE SELECTED REMEDY

The major components of the selected remedy include a low permeability capping system, an irrigation system to supplement natural water infiltration, as necessary, and a venting layer for contingent use. The primary mechanism for control of VOC migration is maintaining near saturated conditions within or above the barrier layer. The intermittent downward infiltration of water will provide an additional factor of safety for control of VOC migration. The physical properties of the low permeability barrier layer and the infiltration water application rate and schedule will be defined during the Remedial Design.

As part of the Remedial Action implementation, data will be collected to evaluate the performance of the capping system. The contingent vent layer underneath the barrier layer provides a multiple factor of safety for VOC control. Monitoring plans and decision points for operation of the vent layer will be established in the Remedial Design.

STATUTORY DETERMINATIONS

Section 121 of CERCLA, 42 U.S.C. § 9621, requires that the selected remedy accomplish all of the following: be protective of human health and the environment; comply with ARARs; be cost effective; utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable; and address whether the preference for treatment as a principal element is satisfied.

The Selected Remedy in this ROD Amendment will be protective of human health and the environment for Site-related contaminants over time because Site-related contaminants in the groundwater will be permanently removed through the existing extraction and treatment system. The selected remedy will comply with all

chemical-, location-, and action-specific ARARs pertinent to this action.

The Commonwealth of Pennsylvania has identified The Land Recycling and Environmental Remediation Standards Act, the Act of May 19, 1995, P.L. 4, No. 1995.2, 35 P.S. §§ 6018.101 et. seq. ("Act 2") as an ARAR for this remedy; EPA has determined that Act 2 does not, on the facts and circumstances of this remedy, impose any requirements more stringent than the federal standards. Section 121 of CERCLA, 42 U.S.C. § 9621, requires that the selected remedy accomplish all of the following: be protective of human health and the environment; comply with ARARs; be cost effective; utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable; and address whether the preference for treatment as a principal element is satisfied.

The selected remedy is the most cost-effective of the alternatives and addressess the Site-related risks posed by the contaminated lagoon area soils by eliminating the direct contact and inhalation exposure pathways.

EPA has determined that the selected remedy represents the maximum extent to which permanent solutions and treatment technologies can be utilized while providing the best balance among the other evaluation criteria. Of the alternatives that are protective of human health and the environment, the selected remedy provides the best balance in terms of the eight other evaluation criteria.

RESPONSIVENESS SUMMARY
TYSON'S SUPERFUND SITE
UPPER MERION TOWNSHIP
MONTGOMERY COUNTY, PENNSYLVANIA

This document summarizes comments and questions raised by the local community with respect to the U.S. Environmental Protection Agency's ("EPA") preferred alternative for remediating the Lagoon Area Soils at the Tyson's Superfund Site ("Site"). These comments and questions were raised at the public meeting held on February 20, 1996 and during the public comment period held from January 31, 1996 to March 30, 1996. This document also summarizes EPA's responses to the local community's questions and comments.

The following questions were asked by one resident during the public meeting and in a follow-up letter to EPA.

* **The resident asked if the comment period could be extended for 90 days, or until May 31, 1996 and at the end of such extension another public meeting be conducted.**

EPA Response: The public comment was extended for 30 days until March 30, 1996. Since this citizen was the only person to request a second public meeting EPA did not feel that a second publc meeting was not justified.

* **The resident asked who generated the risk numbers in the Focused Feasibility Study.**

EPA Response: The risk numbers in the Focused Feasibility Study were generated by the Responsible Parties and reviewed by an EPA toxicologist.

* **The resident asked if a percolation test was performed on the lagoons.**

EPA Response: A rather extensive pumping test was performed on the lagoons and it was determined that the lagoons had a hydraulic conductivity of 2 to 3 gallons per minute.

* **Source of Water: Where will the water come from to saturate the cap?**

EPA Response: At this time, plans are to utilize city water or possibly treated groundwater from the existing treatment system as a source of water to irrigate the cap. Final details on the source of water for the cap will be determined during the remedial design. Untreated groundwater will NOT be used as a source of water to irrigate the cap.

*** Drought: What would happen if we experience a drought in ensuing years such that water use restricitons limit water usage as happened in the year 1995?**

EPA Response: The concept for the wet soil cap is based on maintaining near saturated conditions by irrigation on a intermittent schedule. On average, we anticipate that the water usage requirement will be less than 5 gallons per minute. This usage rate is approximately equivalent to the flow rate from a typical garden hose. The wet soil cap will not require a high demand for water.

*** Disassembling the SVE piping: If these pipes are disassembled, will they be cleaned at the site: If so, what safeguards are in place once the SVE system is removed, to ensure no atmospheric contamination. If they are not precleaned at the site, will they be removed and transported through residential areas?**

EPA Response: Just prior to the construction of the wet soil cap, the existing SVE system will be decommissioned. This means that the components of the SVE system, including the piping, will be dismantled, decontaminated, and removed from the site. Dismantlement and decontamination procedures will be conducted on site. The specific procedures will be defined during the remedial design. The in-place soil vapor extraction wells will be sealed by grouting. The decommissioning of the SVE system will NOT present a risk of exposure.

Heterogeneous subsurface: Will the same heterogeneous soil conditions which led to channeling of the flow of vapors to the SVE system lead to channeling of the downward flow of water and possible a failure of the wet soil cap system? Should we gamble on an untried, unproved technology?

EPA Response: The wet soil cap provides for a homogeneous compacted soil layer to be installed across the site which will control volatile emissions through the cap. The system will permit water to move through the subsurface and inhibit the migration of VOCs upward.

The wet soil cover is based on conventional, well understood scientific and engineering principles. It is very similar to a "clay cap" except that instead of an impermeable clay layer, a more permeable wet soil layer is used. It is simply the use of a well-founded cap technology in a slightly different way, with the objective being VOC emisisons control and allowing natural attenuation of contaminants. In addition, a large safety factor is provided by the contingency vent layer, which allows for venting if it becomes necessary.

*** Seepage along the north wall: Previously, there has been a problem with seepage of VOC-containing liquid through the**

embankment on the northern side of the site by the railroad tracks. Is it possible that such seepage could occur again with the addition of the wet soil cap? Has this been considered in the post implementation and long-term risk assessments?

EPA Response: With respect to the spring/seep that developed along the floodplain in May 1994, it was determined that a malfunctioning pump and check valve in the west sump did not allow for the sump to empty its contents into a holding tank. Rather, it operated in a high level condition. Once discovered, the sump pump and check valve were repaired and the seep collection system inspection program revised to prevent a similar occurrence.

Since that time, no seeps have been observed, including periods of shutdown of the SVE dewatering wells, when the water table was allowed to rebound to static pre-SVE levels. Further, the potential for seep outbreaks will be evaluated during the remedial design phase and, if necessary, modifications to the seep collection system will be made. Since the design and performance criteria for the wet soil cover and seep collection system will evaluate seeps, consideration of potential long-term risk is not appropriate.

*** Clogging by siltation: How would we know if siltration of the various layers occurred: Are there any plans to monitor the success or failure of the various strata?**

EPA Response: Operation of the wet soil cap will include monitoring of the system to ensure that all objectives are being met. The compacted oils layer is likely to consist of a medium to fine silty clayey sand and siltation of this layer is not anticipated to be a problem. Plans for operation of the system include monitoring for contaminants of concern within the layers of the cap and groundwater elevation beneath the cap.

*** Design and engineering questions: Questions raised regarding performance and operation should be ansered before proceeding, not afterward. The concern is not only that some of the ultimate answers might not be acceptable but that by the time it is realized, the project would be so far along that retreat might not be feasible and we would possibly be stuck with a dysfunctional system.**

EPA Response: The feasibility study and remedial design process established by EPA is a systematic process to identify, select, and design the most appropriate remedial alternative to protect human health and the environment. The feasibility study phase focuses on nine evaluation criteria for selection of the most appropriate alternative, including technical feasibility and short and long-term effectiveness of the system. This phase is not intended to answer all detailed design questions. Detailed

items are addressed in the remedial design phase. This phase develops the design criteria for all elements of the project. The EPA review and approval process during the remedial design phase ensures that all the objectives of the selected remedy are addressed.

*** Seep system failure: Would the additional burden placed on the seep system by the added water make it more prone to failures of the type that resulted in the eruption of a spring of contaminated water across the RR tracks in the floodplain area?**

EPA Response: Upgrades to the seep interceptor system will be evaluated as part of the remedial design. Operation of the wet soil cap will not require a high demand for water; therefore, the addition of this capping system on the site will NOT result in a seep collection system which is more prone to failure.

*** Risk assessments: generic questions.**

EPA Response: The FFS, including an assessment of the risks associated with the remedial alternatives, was conducted by the responsible parties with EPA guidance and approval. In conducting the risk assessment, various assumptions are used in developing the chemical specific toxicity factors and in defining the circumstances under which exposure occurs (i.e., the exposure duration or the inhalation rate). There are ranges of values available for most of these parameters, including statistical information on likelihood of occurrence. In preparing for the risk assessment, EPA requested that a protocol be prepared describing the approach that would be applied, and enumerating the values that were proposed for these key toxicity and exposure parameters. EPA's risk assessment expert and air monitoring personnel reviewed the protocol for consistency with EPA guidelines prior to conducting this assessment. EPA assigns values to the toxicity and exposure parameters, and requires the use of values that are at the 95 percentile or high end of the range for these parameters. Thus, the outcome of the risk assessment is largely defined by the protocol that required EPA approval prior to conducting the assessment, and EPA guidance that was used in conducting the assessment, rather than the group that implements the protocol.

A detailed description of the risk assessment methodology, and results of the risk assessment are contained in Appendix F of the FFS Report.

*** Horizontal migration of water from the site: Water migratiang in an easterly or westerly direction will not, in all likelihood, end up in the seep system. Where will it go?**

EPA Response: Groundwater beneath the Tyson's site is contained by two systems. Shallow groundwater is intercepted by the seep

collelction system. Deep groundwater is contained by the extraction wells and treated at the site. The addition of the wet soil cap will result in groundwater mounding beneath the cap and a component of groundwater flow in the east and west directions. Groundwater flow toward the east and west will be contained by the deep groundwater collection and treatment system.

*** Adding water: In what manner will water be added to the capping system?**

EPA Response: At this time, plans include a spray irrigation system. A final decision on the selection of the irrigation system will be made druing the remedial design.

*** Volume of water: What volume of water will be added?**

EPA Response: On average, the water usage requirements will be less than 5 gallons per minute.

The following questions were asked by other residents present during the public meeting.

*** A resident asked for a description of what the continuing operations at the site would be leading up to the implementation of the proposed remedy (wet soil cover). The resident also asked if there was a schedule for monitoring the site in the future.**

EPA Response: Since the volume of contaminants being removed by the Soil Vacuum Extraction system has significantly declined, particularly during the fall and winter seasons, the system has been operating on a reduced schedule beginning May 1 and ending on September 30th. The wet soil cover will be designed during the SVE operating months and installed during the SVE shutdown months. Therefore, the SVE system will remain operational right up until the time the wet soil cover is ready to be installed. An extensive monitoring program will be developed during the design of the wet soil cover. The monitoring plan would be available for review by township officials.

*** Will the Responsible Parties continue to operate the groundwater recovery and treatment system.**

EPA Response: The existing groundwater and recovery and treatment system is not affected by this ROD Amendment and will continue to operate.

* **A resident asked how long the selected alternative will be in place in order to reach some acceptable level of cleanup.**

EPA Response: The wet soil cover, once installed, must remain in place in order to eliminate the risk that may exist through the direct contact, inhalation and ingestion exposure pathways. There is ongoing research being conducted by the Responsible Parties to develop a technology capable of destroying the contaminants that exists in the lagoon area soils. Until such a technology is developed, the wet soil cover will remain in place.

* **A resident asked how dependent is the operation and maintenence of the wet soil cover in keeping the risk levels low.**

EPA Response: A comprehensive operation and maintenance plan will need to be developed and implemented in order to keep the wet soil cover functional and capable of eliminating the risks associated with the lagoon area soils.

* **A resident asked what impact the wet soil cover will have on the roadway that is proposed to be constructed in the vicinity of the Site.**

EPA Response: At this time, with the information currently available to EPA, the installation of the wet soil cover will not preclude the roadway from being constructed. The operation and maintenance plan developed for the wet soil cover will also address any concerns associated with the construction of the proposed roadway.

* **A resident asked if the wet soil cover would need to be actively irrigated.**

EPA Response: An active irrigation system will be developed during the design phase of the wet soil cover.

* **A resident asked what the primary long term risk was associated with and if air quality testing was being performed at the site and how much organics were presently being released into the air.**

EPA Response: The primary long term risk associated with the Site is from inhalation. Air quality testing has been conducted, as required, since the SVE system began operation in 1988. The air emissions that are being released as a result of the SVE system are within acceptables levels as established by EPA and PADEP.

* **A resident asked if air quality was monitored prior to the start up of the SVE system in 1988.**

EPA Response: Prior to 1988 there has been no air monitoring performed at the Site.

* **A resident asked what contaminants exists in the lagoon soils and what were the concentrations.**

EPA Response: During the Remedial Investigation various organic compounds were identified. The four primary indicator compounds identified at the Site are 1,2,3-trichloropropane, benzene, trichloroethene and tetrachloroethene. The concentrations of these compounds range from 10 parts per million in the upper soils to 10,000 parts per million in the deeper soils.

* **A resident asked if bioremediation was considered during the focused feasibility study.**

EPA Response: Bioremediation was one of the technologies that was screened in the feasibility study, but it did not pass the screening and was not developed into a remedial alternative.

* **A resident asked what will happen to the contamination that exists beneath the soils, in the bedrock groundwater, once the wet soil cover is placed over the lagoon area soils.**

EPA Response: Groundwater contamination that exist beneath the lagoon area soils, in the underlying bedrock, has migrated beyond the boundary of the lagoon area soils to the North, East and West. The groundwater contamination plume has been defined through an extensive groundwater remedial investigation. The placement of the wet soil cover will not impact the the quality of the groundwater or the flow direction of the groundwater plume. The groundwater investigation is nearly complete and a remedial action for the contaminated groundwater will be selected in the near future.

The following questions were asked by the Upper Merion Township, Environmental Advisory Council in a letter to EPA dated March 13, 1996.

* **A monthly long term monitoring program of all activities at the site be adopted. The results of this testing to be forwarded to Upper Merion Township for review.**

EPA Response: The monitoring program for the wet soil cover will be developed as part of the Operation and Maintenance Plan. Once the monitoring program is developed it will be submitted to the Township for review and comment. Once the plan is approved and implemented, the results of all testing will be forwarded to the Township for review.

* **Annual testing of all private wells in the area around the Tyson's site to be included in the long term testing program.**

EPA Response: A groundwater monitoring program of private wells around the Site will be developed as part of the remedial action

for the deep aquifer. This action will be implemented in the near future. As part of this action, a groundwater monitoring program will be developed and submitted to the Township for review and comment.

*** A public safety emergency program be in place prior to the commencement of further remedial action. This program to be coordinated with Upper Merion public safety officials.**

EPA Response: During the design phase of the wet soil cover, prior to construction, a Health and Safety Plan will be developed and submitted to the Township for review and comment. Health and Safety aspects of the construction, operation and maintenance of the wet soil cover will be coordinated with Township officials.

*** In the future, bioremediation may be the long term solution to the Tyson's site. With that prospect in mind, we suggest that Cibs consider the mechanical infra-structure of the SVE system be left in place and in such condition that it could be restarted in the future to enhance the delivery of oxygen to a bioremediation program. Ciba-Geigy/Sandoz should continue to provide the township with information regarding this new technology.**

EPA Response: Ciba-Geigy will continue to research a bioremediation technology that could be implemented at the Tyson's site in the future. Ciba-Geigy will also update EPA and Upper Merion Township on occasions regarding any progress that is being made in this research. Should a bioremediation technology that could be implemented at Tyson's become available, a new system to deliver this technology to the subsurface would need to be developed. Leaving the infra-structure of the SVE system in place has been considered and found not to be feasible.