



Superfund Record of Decision:

Ellisville Area, MO



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16. Abstract (Limit: 200 words) The Ellisville Area site is a former waste oil disposal site in Ellisville, St. Louis County, Missouri. The site consists of the 11.6-acre Bliss property and four contiguous properties where hazardous substances have been identified. Land use in the area is mixed residential, rural, and recreational. Surface runoff at the site drains to Caulks Creek, a tributary of Bonhomme Creek, which enters the Missouri River about 1 mile upstream of a city of St. Louis waterworks intake. The site does not lie in a floodplain, but flooding of Caulks Creek occurs during periods of heavy rain. During the 1960's and 1970's, Bliss Waste Oil Company used the site to transport and dispose of waste oil products (some of which were contaminated with dioxin), industrial wastes, and chemical wastes. Liquid wastes were poured into pits, applied to the ground surface, and stored in drums and buried. Dioxin-contaminated waste oil was applied directly to surface soil for dust control, and spillage from trucks also occurred. Investigations conducted from 1982 through 1983 concluded that site contamination was not affecting the ground water; however, some onsite surface migration of contaminated soil and sediment had occurred. In 1985, the State constructed a diversion dike to redirect stormwater runoff, which (See Attached Page)				
17. Document Analysis a. Descriptors Record of Decision - Ellisville Area, MO Second Remedial Action - Final Contaminated Medium: soil Key Contaminants: organics (dioxin) b. Identifiers/Open-Ended Terms c. COSATI Field/Group				
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Abstract (Continued)

flowed through a fill area containing buried drums; and fenced the site. A 1986 Record of Decision (ROD) selected a final remedy for non-dioxin wastes at the site and an interim remedy for dioxin waste at the site including excavation and interim onsite storage of dioxin-contaminated materials. The interim remedy has not been implemented. A 1988 ROD established the availability of a thermal treatment unit at the Times Beach site to treat dioxin-contaminated sites in eastern Missouri including the Ellisville Area. This ROD provides a final remedy for dioxin-contaminated soil, which involves excavation and direct transport of dioxin wastes offsite for treatment. The 1986 remedy for non-dioxin wastes is not affected. The primary contaminant of concern affecting the soil is dioxin, an organic.

The selected remedial action for this site includes excavating and direct transportation of approximately 7,000 cubic yards of dioxin-contaminated soil for treatment at an offsite temporary thermal treatment unit constructed at the Times Beach site; disposing of treatment residuals at the Times Beach site as nonhazardous solid waste if delisting criteria are met, or retreating at Times Beach or managing residuals offsite as a hazardous waste if delisting criteria are not met. The estimated present worth cost for this remedial action is \$17,530,000. There are no O&M costs associated with this remedial action.

PERFORMANCE STANDARDS OR GOALS: Performance standards for the thermal treatment of soil include six-nines (99.9999 percent) destruction and removal efficiency and delisting of the thermal treatment residue.

RECORD OF DECISION DECLARATION

SITE NAME AND LOCATION

- Ellisville Area Site (Bliss portion), Ellisville, St. Louis County, Missouri

STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected remedial action for the Bliss-Ellisville site in St. Louis County, Missouri, developed in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and, to the extent practicable, the National Contingency Plan (NCP). This decision is based on the administrative record for this site. The State of Missouri concurs with the selected remedy.

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 Record of Decision (ROD), may present an imminent and substantial endangerment to public health, welfare, or the environment.

DESCRIPTION OF THE SELECTED REMEDY

(6.41) This remedial action represents the final action for dioxin-contaminated soils at the Bliss-Ellisville site. A Record of Decision (ROD) issued by the Environmental Protection Agency (EPA) in 1986 selected a remedy involving excavation and interim, onsite storage of 2,3,7,8-tetrachlorodibenzo-p-dioxin- (dioxin-) contaminated materials at the site, pending final management. In September 1988, EPA issued a ROD which established the availability of a thermal treatment unit at Times Beach to treat dioxin-contaminated materials from 27 eastern Missouri dioxin sites, including the Bliss-Ellisville site. In consideration of the pending availability of a thermal treatment unit at Times Beach, the Agency has reconsidered the need for excavation and interim onsite storage. This ROD selects a final remedy for the contaminated materials currently in storage at the Bliss-Ellisville site. The primary components of the selected remedy include:

- Excavation of approximately 7,000 cubic yards of dioxin-contaminated soils,
- Transportation of the excavated materials to the Times Beach site,

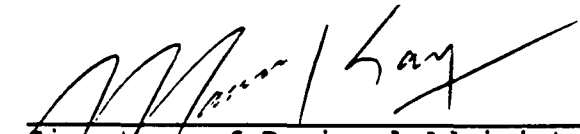
- Thermal Treatment of these contaminated materials at a temporary thermal treatment facility to be operated at Times Beach, and
- Final restoration of the Bliss-Ellisville site.

This remedial action addresses the principal threats at the site through thermal treatment of dioxin-contaminated soils exceeding health-based levels. Thermal treatment results in the destruction of dioxin, permanently removing this contamination from the environment.

DECLARATION

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

Because this remedy is a component of a comprehensive cleanup that will not leave hazardous substances onsite above health-based levels, the five-year review will not apply to this action.



Signature of Regional Administrator

9-30-91

Date

**RECORD OF DECISION
FOR
FINAL MANAGEMENT OF
DIOXIN-CONTAMINATED MATERIALS**

and

**AMENDMENT
TO
SEPTEMBER 29, 1986
RECORD OF DECISION**

**ELLISVILLE AREA SITE (BLISS PORTION),
ST. LOUIS COUNTY, MISSOURI**

Prepared by

U.S. ENVIRONMENTAL PROTECTION AGENCY

September 30, 1991 (0.0.2)

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INTRODUCTION

The Bliss-Ellisville site is one of twenty-eight sites located in eastern Missouri which were contaminated through the application of dioxin-contaminated waste oil in the early 1970's, or due to the subsequent movement of these contaminated soils.

In September 1986, the Environmental Protection Agency (EPA) issued a Record of Decision (ROD) for the Bliss-Ellisville site. This ROD formally selected a final remedy to be implemented for the non-dioxin wastes at the site, and an interim remedy to be implemented for the dioxin wastes at the site. The interim remedy selected for the dioxin wastes involved excavation of contaminated soils and temporary onsite storage awaiting final management. This interim remedy for dioxin wastes at the Bliss-Ellisville site has not yet been implemented.

On September 29, 1988, EPA issued the Record of Decision for Final Management of Dioxin-Contaminated Soil and Final Disposition of Structures and Debris at Times Beach, Missouri and the Minker/Stout/Romaine Creek Site, Missouri (Times Beach ROD). Other eastern Missouri dioxin sites were considered in the Times Beach ROD in order to evaluate potential remedies for Times Beach and Minker/Stout/Romaine Creek in the context of a comprehensive remedy for all designated eastern Missouri dioxin sites.

Implementation of the Times Beach ROD will involve thermal treatment (incineration) of dioxin-contaminated soil from the Times Beach and Minker/Stout/Romaine Creek sites at a temporary thermal treatment unit located at Times Beach. The Times Beach ROD also establishes that the dioxin-contaminated soils from a group of designated eastern Missouri sites, including the Bliss-Ellisville site, can be transported to Times Beach for thermal treatment. In consideration of the pending availability of a thermal treatment unit at Times Beach to treat dioxin-contaminated materials at the Bliss-Ellisville site, EPA has re-evaluated the need for interim storage of these materials at the site.

This document selects the final management alternative for dioxin-contaminated soils at the Bliss-Ellisville site. The selected remedy involves excavation of dioxin-contaminated soils and direct transport to Times Beach for thermal destruction without interim storage.

I. SITE NAME, LOCATION, AND DESCRIPTION

The Bliss-Ellisville site is located in west St. Louis County, Missouri. The site is located approximately 20 miles

west of downtown St. Louis, and is comprised of the 11.6 acre Bliss property, and four contiguous properties where hazardous substances have been identified. Land use in the vicinity is a mixture of residential, rural, and recreational. Residential development of nearby areas is rapidly occurring. Structures onsite include an occupied residence, two mobile homes, a large indoor horse arena and stables, an outdoor riding arena, barns, garages, and silos.

The developed portion of the site lies in the central leg of a relatively flat "Y" shaped valley with hillside slopes which vary from 25 to 50 percent. The developed portion consists of four general areas: The Mid-America Arena and parking area, the riding ring area, the northeast fill area, and the northwest fill area. The site is located in an upland area underlain by limestone bedrock which exhibits high water permeability along solution-enlarged joints. A tributary of Caulks Creek drains the property to the northwest. Caulks Creek is a tributary of Bonhomme Creek, which enters the Missouri River about one mile upstream of a City of St. Louis waterworks intake. Generally, there is ground water recharge on and adjacent to the site. The site is not in a designated floodplain, but flooding of the creek draining the site is likely during periods of heavy rains due to rapid runoff.

The Bliss-Ellisville site consists primarily of alluvial flat and colluvial slopes. Earth grading has created relatively flat areas and altered drainage. The surface is underlain by about three to ten feet of silty clay. Soils on the Bliss property are reported to have moderate permeability. The depth to bedrock is about 10 to 15 feet. Based on information for wells in the Bliss property vicinity, the ground water table elevation is estimated to be about 560 feet. The elevation range for the Bliss property is from 630 feet on the north to about 710 feet on the south.

II. SITE HISTORY AND ENFORCEMENT ACTIVITIES

Site History

During the 1960's and 1970's the site served as the headquarters of the Bliss Waste Oil Company, engaged in the transportation and disposal of waste oil products, industrial wastes, and chemical wastes. Responding to reports of past dumping activities, EPA and the Missouri Department of Natural Resources (MDNR) conducted an investigation of the site in September 1980, during which buried containers were discovered. A subsequent MDNR investigation in June 1981, confirmed the presence of buried drums containing hazardous substances and

provided evidence that liquid wastes had been poured into pits and applied to the ground surface. During operation of the Bliss Waste Oil Company, surface soils became contaminated with dioxin through the direct application of dioxin-contaminated waste oil on the surface for dust control, or due to spillage from tanker trucks.

In October 1981, EPA announced that the Ellisville Area Site, including the Bliss-Ellisville properties and two separate non-contiguous locations, was being added to the National Priorities List.

A remedial investigation of the site was conducted from 1982 through 1983. In 1983, the remedial investigation report concluded that the Ellisville Area Site is not contaminating ground water, however some surface migration of contaminated soils and sediments had occurred onsite.

Also in 1983, a feasibility study was released evaluating remedial alternatives for the three portions of the Ellisville Area Site. The 1983 feasibility study recommended either onsite containment of dioxin-contaminated materials at the Bliss-Ellisville site, or excavation and transport to the Times Beach site for storage.

In 1986, a feasibility study was completed which evaluated interim onsite storage options for the dioxin-contaminated materials present at the Bliss-Ellisville site. A Record of Decision was issued by EPA in September 1986, selecting excavation and interim onsite storage of dioxin-contaminated materials at the site. This remedy has not yet been implemented.

In August 1985, MDNR constructed a diversion dike to reroute stormwater runoff which flowed through a fill area containing buried drums. As part of this effort, a liner was installed along the portion of the creek which flows through the area of buried containers, in the northwest arm of the site. In April 1986, MDNR erected a 450-foot fence along a bike path adjacent to the site. EPA completed installation of a perimeter fence in August 1990.

Numerous other site investigations have been performed at the Bliss-Ellisville site by EPA, MDNR, and others. The results of the most recent investigations are summarized in the current Feasibility Study for Final Management of Dioxin-Contaminated Materials -- Bliss-Ellisville Site. This feasibility study was released for public comment on July 26, 1991.

Enforcement Actions

The potentially responsible parties (PRPs) for this site (and the other Missouri dioxin sites which are the subject of pending litigation) include the generators of the dioxin waste, the transporter of the waste, and those who arranged for the transport and spraying of the waste.

Six dioxin sites were originally included in the U.S. v. Bliss, et al., complaint, Civil Action No. 84-200C(1), which was filed in the Federal District Court for the Eastern District of Missouri on January 20, 1984. This site is one of 21 additional sites in eastern Missouri, which became contaminated with dioxin through similar means, that were added to this litigation on March 1, 1989, (Civil Action Nos. 89-351 C (1) through 89-571 C (1)). The cases were consolidated with the original case for discovery and trial. On April 6, 1990, the United States commenced Civil Action No. 90-656 C (1) which has been consolidated with the other related civil actions for a total of 28 eastern Missouri dioxin sites. Partial summary judgment pursuant to Section 107 of CERCLA has been granted as to the Bliss defendants for all the sites.

Special Notice letters were issued to the Syntex defendants and to Independent Petrochemical Corporation on March 31, 1988. The moratorium required by Section 122(e) of the Superfund Amendments and Reauthorization Act (SARA) began on the date of issuance of this notice.

The pleadings in the above litigation refer to 28 sites, while EPA's technical documents designate 27 sites. The discrepancy in numbers is due to a difference in nomenclature used by EPA and the Department of Justice. The same group of designated sites are represented by both lists.

On December 31, 1990, a Consent Decree between the United States, State of Missouri, and the four Syntex defendants was entered in Federal District Court for the Eastern District of Missouri. This Consent Decree provides for implementation of a comprehensive remedy for the 28 eastern Missouri dioxin sites referenced in the above civil actions. The remedy is to be implemented according to a mixed-work arrangement, in that the EPA, State of Missouri, and Syntex each have separate responsibilities. The Consent Decree provides thermal treatment capacity at Times Beach for all designated eastern Missouri dioxin sites, including the Bliss-Ellisville site.

The Syntex Consent Decree does not select a remedy for any of the eastern Missouri dioxin sites. The Consent Decree does provide for the implementation of certain response actions at the

eastern Missouri dioxin sites, if these response actions are selected by EPA through the conventional remedy selection process.

Also on December 31, 1990, a Consent Decree between the United States of America, the State of Missouri, and the Northeast Pharmaceutical and Chemical Company (NEPACCO) defendants was entered in Federal District Court. The NEPACCO Consent Decree provides for cash settlement of the NEPACCO defendants' liability.

Litigation continues with the Bliss defendants and Independent Petrochemical Corporation.

III. COMMUNITY RELATIONS HISTORY

The preferred alternative for the Bliss-Ellisville site presented in this document is a component of the overall remedy for the eastern Missouri dioxin sites which was considered in the Times Beach ROD. Considerable public involvement has occurred during the remedy selection process for the eastern Missouri dioxin sites.

The public was first invited to comment on the concept of a comprehensive solution for all of the eastern Missouri dioxin sites at the September 5, 1986, public meeting, where it was announced that Times Beach would be evaluated as a potential location for siting a temporary thermal treatment unit. It was announced that a feasibility study would be prepared to evaluate Times Beach as a potential location for centralized thermal treatment of dioxin-contaminated soils from designated eastern Missouri sites.

A feasibility study was released for Times Beach in December 1986, which evaluated centralized thermal treatment at Times Beach. A public comment period was conducted for this feasibility study from December 1986 through March 1987. A public meeting was held on February 12, 1987, to discuss alternatives evaluated in the study.

A public comment period for the Proposed Plan for Times Beach and the Minker/Stout/Romaine Creek sites was conducted in February and March of 1988. The remedy proposed by EPA involved centralized thermal treatment at Times Beach of nearby dioxin-contaminated soils. A public meeting was held in Eureka, Missouri on March 10, 1988, to discuss the preferred alternative. A Record of Decision was issued by EPA on September 29, 1988, selecting centralized thermal treatment of dioxin-contaminated materials at Times Beach. This Record of Decision established

that dioxin-contaminated materials from a designated group of eastern Missouri sites, including the Bliss-Ellisville site, could be transported to Times Beach for thermal treatment.

A public comment period for the Proposed Plan and Feasibility Study for Final Management of Dioxin-Contaminated Materials -- Bliss-Ellisville Site was initiated on July 26, 1991. The close of the public comment period was extended from August 26, 1991, to September 3, 1991. A public meeting was held on August 22, 1991, to present the feasibility study and Proposed Plan. EPA's preferred remedy involved transportation of dioxin-contaminated materials at the Bliss-Ellisville site to Times Beach for thermal treatment.

Public involvement also preceded entry of the Syntex and NEPACCO Consent Decrees in Federal District Court. Public comment periods were conducted for these Consent Decrees in August and September 1990.

Responsiveness summaries have been prepared to address all comments received during the public comment periods described above. These responsiveness summaries, and other documents described in this section, are included in the Administrative Record for the Bliss-Ellisville site, and can be referred to for additional information on the history and background of the site.

IV. SCOPE AND ROLE OF RESPONSE ACTION

The overall remedy for the Bliss-Ellisville site involves remediation of containerized non-dioxin wastes, soils contaminated with non-dioxin wastes, and soils contaminated with dioxin. Investigations conducted to date have not indicated that buried containers or soil contaminated with other organic compounds are also contaminated with dioxin. It is possible that dioxin contamination may exist in overburden above the buried containers or in soils above the former waste disposal pits.

The 1986 Record of Decision for the Bliss-Ellisville site selected excavation and subsequent offsite treatment or disposal for buried containers and soils contaminated with other organic compounds (non-dioxin wastes). The 1986 ROD also selected excavation and interim onsite storage of dioxin-contaminated materials pending final management. This Record of Decision addresses only final management of the dioxin-contaminated soils. The remedy selected in 1986 for the non-dioxin wastes is not affected, and will proceed according to the 1986 Bliss-Ellisville ROD.

The remedy selected in this current Record of Decision eliminates interim storage of dioxin-contaminated materials due to the pending availability of a thermal treatment unit at Times Beach. Since the 1986 Bliss-Ellisville ROD selected interim storage of the dioxin-contaminated materials, this document serves as an amendment to that ROD. This document also represents a Record of Decision which selects thermal treatment at Times Beach as a final remedy.

V. SITE CHARACTERISTICS

This remedy selection is limited to soils contaminated with dioxin. The short-term potential for direct contact with soils has been controlled by installation of a security fence surrounding the dioxin-contaminated portion of the site and posting of the site perimeter with warning signs. The principal current concern is for intruders, residents, or visitors who may disturb or otherwise contact contaminated soils.

In September 1986, the Agency for Toxic Substances and Disease Registry (ATSDR) issued a health consultation to EPA concerning the Bliss-Ellisville site. The consultation recommended removal of dioxin-contaminated soils exceeding 1 part per billion (ppb), but noted that the acceptable level may be greater if the contaminated soil is located below the surface so that direct contact may not occur. The ATSDR consultation also recommended preventing access to the site, and concurred with EPA's preferred interim storage remedy.

On January 16, 1987, EPA submitted to the Centers for Disease Control, Center for Environmental Health (CDC/CEH), the proposed cleanup criteria for dioxin contamination at the Bliss-Ellisville site. According to the proposal, excavation would proceed until reaching a residual concentration of 1 ppb, or until a residual concentration of 5 to 10 ppb is reached after removal of one foot of soil. Excavation would not proceed beyond a total depth of four feet or once solid bedrock was encountered. All excavated areas would be backfilled to original grade with clean soil.

The CDC/CEH concurred with EPA's proposed cleanup criteria for the Bliss-Ellisville site on January 22, 1987. ATSDR further supported the proposed cleanup criteria, and provided additional discussion, in July 30, 1987, correspondence to EPA.

VI. SITE RISKS

The contaminant addressed by this selected remedy is 2,3,7,8-tetrachlorodibenzo-p-dioxin (referred in this document to

as dioxin). Dioxin is among the most toxic compounds yet identified by EPA. Although dioxin has been highly toxic in all species tested, there are large species differences in sensitivity. Animal studies have also demonstrated that dioxin is teratogenic (causes malformities) and fetotoxic (toxic to fetus) in several species.

Since exposure to dioxin produced statistically significant increased incidents of tumors in certain animal species, there is sufficient evidence to conclude that dioxin is an animal carcinogen. In consideration of the available animal carcinogenic and epidemiologic data, the overall weight-of-evidence classification (using EPA's interim classification scheme) is that dioxin is a probable human carcinogen.

Dioxin will adsorb tightly to organic material in soil, resulting in low mobility. Once in the soil, degradation processes tend to be very slow, with half lives estimated to be ten years or longer. Experimental results show that dioxin will accumulate and concentrate in fish and wildlife. In mammals, dioxin is readily absorbed through the gastrointestinal tract. Absorption through skin has also been reported.

The principal current concern would be for residents, visitors, or intruders who may disturb contaminated soils. Ingestion of soils or inhalation of particulates contaminated with dioxin present the greatest threat to human health. Wildlife (deer, turkey, rabbits) entering the site area could be susceptible to contamination.

Actual or threatened releases of hazardous substances from this site, if not addressed by the preferred alternative, may present a current or potential threat to public health, welfare, or the environment.

VII. DESCRIPTION OF ALTERNATIVES

The EPA evaluated four alternatives for management of dioxin-contaminated materials at the Bliss-Ellisville site. The remedial alternatives considered during this evaluation were 1) no action, 2) in-place containment, 3) excavation and interim onsite storage pending final management, and 4) thermal treatment at Times Beach. A description of the alternatives is provided below.

Alternative 1 -- No Action

Under the no-action alternative, no additional remedial actions would be taken at the site. Maintenance of the previous

mitigation efforts, including bank stabilizations and fencing, would not be provided. The no-action alternative is not protective of human health and the environment. This alternative has no additional capital or operation and maintenance costs. No ARARs were identified for this alternative.

Alternative 2 -- In-Place Containment

Estimated Construction Cost: \$774,000
Estimated Annual O & M Costs: \$23,400
Estimated Present-Worth Costs: \$1,130,000
Estimated Implementation Timeframe: 4-6 months

This alternative involves placement of a clean soil layer and synthetic erosion control materials along eroded portions of creek beds. Disturbed or eroded areas of the site would be reseeded. Unpaved portions of the site with dioxin levels exceeding 1 ppb would also be mowed, fertilized, and reseeded.

Maintenance of the vegetation and cover systems would be necessary to maintain the effectiveness of this remedy. No ARARs were identified which have a major impact on implementation of this alternative.

Alternative 3 -- Excavation and Onsite Storage

Estimated Construction Cost: \$13,590,000
Estimated Annual O & M Costs: \$25,000
Estimated Present-Worth Costs: \$13,700,000
Estimated Implementation Timeframe: 6 months

This alternative involves excavation and onsite storage of approximately 7,000 cubic yards (cy) of dioxin-contaminated soils pending final management. The storage facilities would not be designed or constructed for the purpose of providing permanent storage. Continued operation and maintenance of the storage facilities would be provided to control the potential for future release of contaminants.

The primary ARARs pertaining to this alternative are hazardous waste storage requirements under both the Resource Conservation and Recovery Act (RCRA) and the Missouri Hazardous Waste Management Law (HWML).

Alternative 4 -- Thermal Treatment at Times Beach

Estimated Construction Cost: \$17,530,000
Estimated Annual O & M Costs: \$0

Estimated Present-Worth Costs: \$17,530,000
Estimated Implementation Timeframe: 6 months

This alternative involves excavation of approximately 7,000 cubic yards of dioxin-contaminated soils at the Bliss-Ellisville site and transportation to the Times Beach site. A temporary thermal treatment unit located at the Times Beach site would be used to destroy dioxin contaminants in the soil.

The time to implement this alternative would be dependent upon the operation schedule of the temporary thermal treatment unit at Times Beach. No operation and maintenance activities related to the dioxin contamination would be necessary following implementation of this remedial alternative.

The primary ARARs associated with this alternative consist of transportation, storage, and incinerator requirements under RCRA and HWML, emissions requirements under the Clean Air Act, Missouri Solid Waste Management Regulations, potential NPDES requirements under the Clean Water Act, and Department of Transportation requirements.

VIII. COMPARATIVE ANALYSIS OF ALTERNATIVES

The alternatives described in Section 5 were evaluated using nine evaluation criteria which relate directly to factors mandated by Section 121 of CERCLA, as amended. These include threshold criteria of overall protection of human health and the environment, and compliance with applicable or relevant and appropriate requirements (ARARs), primary balancing criteria of long-term effectiveness and permanence, reduction of toxicity, mobility, or volume through treatment, short-term effectiveness, implementability, cost, and modifying criteria of State acceptance and community acceptance. The comparative evaluations of alternatives are summarized below.

Protection of Human Health and the Environment

Protection of human health and the environment is the central mandate of CERCLA, as amended by SARA. Protection is achieved by reducing risks to acceptable levels and taking action to ensure that there will be no future unacceptable risks to human health and the environment through any exposure pathway.

Alternative 4, involving thermal treatment, provides the highest overall protection of human health and the environment. Thermal treatment is the only demonstrated technology with proven effectiveness at destroying dioxin on a full scale. Thermal treatment has been shown to be capable of destroying dioxin to

non-detectable levels.

Short-term risks associated with potential air emissions during thermal treatment operation are controlled through continuous process and emissions monitoring and redundant safety features. The thermal treatment unit at Times Beach will be equipped with emergency shutdown systems which activate if criteria specified by the operating permit are violated, thereby controlling the potential for release of hazardous substances due to incinerator upsets.

EPA has determined that risks associated with the transportation of dioxin-contaminated materials to Times Beach are not significant. The dioxin-contaminated materials are relatively immobile in the environment. Any spill of contaminated materials during transport could be immediately and effectively cleaned up and removed. Transportation risks will be further reduced by designating haul routes which avoid population centers to the greatest extent possible. The contaminated soils will be hauled in lined truck beds. The truck bed liner will be gathered and secured above the contaminated soils, and covered with a tarp which will be tightly fastened to the exterior bed walls to prevent escape of the truck's contents.

Alternative 1, No Action, would not provide protection of human health and the environment. Without continued maintenance, the fencing and containment systems would eventually fail, resulting in increased opportunity for human exposure to site contaminants.

Alternative 2, in-place containment, would provide greater overall protection than no action, but has a low degree of permanence. The containment system would reduce erosion potential and provide a partial barrier which would reduce exposure potential while maintained. Continued maintenance of the security and containment measures would be required to prevent future increased exposure potential.

Alternative 3 Provides a somewhat higher degree of permanence relative to in-place containment, due to increased reliability of the storage systems. The storage facilities would require continued maintenance to provide protection of human health and the environment. Maintenance costs would be expected to increase as the design life of the storage systems is approached or surpassed. Without maintenance, the storage systems would eventually fail, resulting in the release of dioxin-contaminated materials to the environment. Catastrophic failure (flood, earthquake, etc.) could result in a release of contaminants into the environment for both Alternatives 2 and 3, regardless of maintenance.

Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)

Remedial actions conducted under CERCLA authority must comply with applicable or relevant and appropriate requirements or standards (ARARs) under other Federal and State environmental laws, or justify a waiver from these requirements.

Requirements for protection of site workers under the Occupational Safety and Health Act (OSHA) constitute ARARs which are common to all action alternatives. Adherence to a site health and safety plan will assure compliance with these OSHA requirements. Also, National Pollution Discharge Elimination System (NPDES) requirements may impact stormwater management practices conducted as part of the action alternatives. The ARARs discussed below are those that have a major impact on the implementation of the alternatives.

No ARARs were identified that have a major impact on the implementation of alternatives 1 and 2. ARARs associated with Alternative 3 include hazardous waste storage requirements under RCRA and HWML. Alternative 4 involves activities at both the Bliss-Ellisville site and Times Beach. No significant ARARs were identified for excavation and loading of dioxin-contaminated soils at the Bliss-Ellisville site. ARARs for transportation of hazardous wastes exist under RCRA and Department of Transportation regulations.

The primary ARARs associated with Alternative 4 are requirements under RCRA and HWML for the operation of the thermal treatment unit at Times Beach. These ARARs are summarized below, and more fully explained in the 1988 Times Beach Record of Decision, and the Explanation of Significant Differences for the Times Beach site issued July 18, 1990. These documents are included in the Administrative Record for the site.

CERCLA section 104(d)(4) allows EPA to treat two or more non-contiguous facilities as one site, where the facilities are reasonably related on the basis of either geography or the threat posed to human health and the environment. The EPA has determined that the designated eastern Missouri dioxin sites are related based on the threat posed, and should be treated as one site for response purposes. Accordingly, the thermal treatment of dioxin-contaminated materials from the designated locations at a single, central location is considered to be an onsite action.

The consideration of the designated dioxin sites as one site

is significant because onsite actions must meet the substantive requirements, but not the administrative requirements, of other laws. The issuance of permits is generally considered an administrative requirement. For the Times Beach thermal treatment unit, however, permits will be issued pursuant to RCRA and HWML, the Clean Air Act, and the Clean Water Act. The Agency believes that these measures are responsive to concerns expressed by the public regarding the duration of the project and limits on the sources of materials to be transported to Times Beach.

Resource Conservation and Recovery Act (RCRA):

RCRA, as amended by the Hazardous and Solid Waste Amendments (HSWA) of 1984, regulates the generation, transportation, treatment, storage, and disposal of hazardous wastes as defined in 40 CFR Part 261. As of July 15, 1986, certain dioxin-containing wastes are specifically regulated under RCRA as hazardous wastes. Certain requirements under RCRA are considered applicable or relevant and appropriate to Alternatives 3 and 4.

The Missouri Hazardous Waste Management Law (HWML) and implementing regulations are very similar to the Federal RCRA program in almost all respects. No requirements additional to those under RCRA were identified in the Missouri Code for the Bliss-Ellisville site.

The RCRA Land Disposal Restrictions under 40 CFR Part 268 prohibit land disposal of dioxin-contaminated material after November 8, 1988. A two-year extension of this date has now expired. Land disposal of dioxin wastes is not a component of any of the four alternatives. Thermal treatment residues at Times Beach will be tested to verify that they are non-hazardous and delisted prior to land disposal. The RCRA Land Disposal Restrictions therefore do not impact the four remedial alternatives currently being evaluated for the Bliss-Ellisville site.

Federal and State Water Quality Criteria:

Alternatives 1, 2, and 3 involve no wastewater discharge of any type. The thermal treatment unit at Times Beach, under Alternative 4, may utilize wet air pollution control systems which generate wastewater that must be discharged following attainment of delisting criteria. In this event, the wastewater discharge will be in accordance with an NPDES permit issued by the State of Missouri. An NPDES permit is not required for onsite actions, but will be issued in order to provide public assurance regarding the safety of the thermal treatment unit.

Stormwater runoff may occur during implementation of

excavation activities at the Bliss-Ellisville site. Diversion systems will be placed to control the potential for stormwater runoff from contacting contaminated portions of the site during the response action. Measures will also be taken to control potentially-contaminated stormwater runoff from leaving the site during the response action. Management of stormwater runoff at the Bliss-Ellisville site during the response action will be performed in substantive compliance with all NPDES requirements.

Clean Air Act, Missouri Air Conservation Law:

The Clean Air Act and the Missouri Air Conservation Law contain permitting requirements for sources of certain types and quantities of air pollutants. Although the RCRA thermal treatment performance standards are more stringent than Clean Air Act requirements, in most respects, emissions of some of the more conventional pollutants are not addressed by the RCRA standards. The Federal Clean Air Act program is administered by the MDNR and St. Louis County.

These requirements are applicable to Alternative 4 due to potential air emissions from the thermal treatment unit at Times Beach. Air emissions from the Times Beach thermal treatment unit will comply with all substantive requirements of the Federal Clean Air Act and Missouri Clean Air Act. A permit pursuant to the Missouri Clean Air Act will be issued in order to provide public assurance regarding the safety of any possible air emissions.

Solid Waste Disposal Regulations:

Missouri solid waste management regulations require that solid waste, in general, be disposed of in a landfill meeting design and operating requirements of a demolition or sanitary landfill. These regulations are applicable to disposal of thermal treatment residues at Times Beach. Missouri solid waste management regulations also require that any landfill located in a floodplain must be designed to prevent floodwater from contacting the solid waste. An additional waste category, "special waste," has been created for those solid wastes requiring handling other than normal municipal wastes. Special wastes are subject to waste-specific disposal requirements established on a case-by-case basis. Incinerator ash is generally considered a special waste.

Land disposal of delisted thermal treatment residue at Times Beach will be performed in accordance with the substantive State solid waste disposal requirements. Approval will be obtained from the State prior to onsite land disposal of residue (ash) from the thermal treatment process.

Alternatives 2, 3, and 4 could be implemented in compliance with the substantive requirements of all identified ARARs. As described above, the administrative permitting requirements of certain designated authorities will also be met to satisfy public concerns regarding the duration and extent of the project.

Reduction of Toxicity, Mobility or Volume through Treatment

This evaluation criteria relates to the performance of a technology or remedial alternative in terms of eliminating or controlling risks posed by the toxicity, mobility, or volume of hazardous substances.

Alternative 4 involves thermal treatment of dioxin-contaminated soils which exceed health-based levels. Thermal treatment destroys dioxin, thereby eliminating the toxicity, mobility, and volume of this contaminant.

Alternatives 1, 2, and 3 do not involve treatment, and do not reduce toxicity of contaminants. Contaminant volumes may actually increase under Alternatives 1, 2, or 3. The no action alternative may result in increased volume of material to be managed due to uncontrolled contaminant migration. Some contaminant migration may also continue to occur after in-place containment. In the event of storage system failure, Alternative 3 could release contaminants and increase the volume of materials to be managed.

The mobility of the contaminants would remain the same for the no action alternative. Alternatives 2 and 3 would have relative reductions in the mobility of contaminants.

Short-Term Effectiveness

Short-term effectiveness addresses how well an alternative is expected to perform, the time to achieve protection and the potential adverse impacts of its implementation.

Short-term risks at Times Beach associated with Alternative 4 can be effectively controlled through process and emissions monitoring. Short-term risks associated with transportation of contaminated materials to Times Beach can also be controlled, as discussed above.

There are no significant short-term risks at the Bliss-Ellisville site associated with any of the alternatives. Short-term risks would remain at the current level for the no action alternative. Short-term risks associated with disturbance of surface soils could be controlled by air monitoring, use of dust

suppressants, and protective equipment for workers.

Long-Term Effectiveness and Permanence

Long-term effectiveness and permanence addresses the long-term protection and reliability an alternative provides.

Alternative 4 permanently destroys the dioxin contamination, providing the highest level of long-term protectiveness.

Alternative 1 involves no further action at the site, and provides the lowest degree of long-term effectiveness.

The containment alternative and storage alternative are both dependent upon continued maintenance to maintain their effectiveness. Without continued maintenance, failure would occur, resulting in a release of contaminants into the environment. Alternatives 2 and 3 provide a low degree of permanence. With continued maintenance, Alternatives 2 and 3 could provide a moderate degree of long-term protectiveness, but future release due to catastrophic failure is possible.

Implementability

Implementability addresses how easy or difficult, feasible or infeasible, an alternative would be to carry out from design through construction, operation and maintenance.

Thermal treatment represents a relatively complex operation, involving many interrelated activities which are coordinated in order to effectively and safely destroy the dioxin contamination. Thermal treatment of contaminated soils has been successfully demonstrated on more than 10 full-scale projects nationwide involving contaminated soils. Process controls and air monitoring ensure that thermal treatment is conducted safely and effectively.

Alternative 1 has no implementation necessary. Alternative 2 is easily implementable, incorporating common landscaping practices. Excavation and containerization activities associated with Alternative 3 are more complex than Alternative 2, but can be performed effectively and safely, as evidenced by similar response actions taken at other eastern Missouri dioxin sites. Excavation and bulk transport associated with Alternative 4 are conventional construction activities which could be accomplished without difficulty.

All action alternatives would require a comparable amount of time to implement. Alternatives 2 and 3 could be implemented immediately. Implementation of Alternative 4 would be dependent upon scheduling of other sites and upon the availability of the thermal treatment facility at Times Beach.

Cost

CERCLA requires that EPA select the most cost-effective (not merely the lowest cost) alternative that is protective of human health and the environment and meets other requirements of the law.

No cost is associated with Alternative 1. In-place containment has the lowest cost of any of the action alternatives (\$1.1 million). Alternative 2, however, will have continuing maintenance requirements to maintain the effectiveness of the remedy. The cost of Alternative 4 is the highest of the alternatives considered (\$17.5 million), but provides a permanent remedy for the dioxin contaminants destroyed. The annual cost of interim onsite storage is somewhat lower (\$13.6 million) than the thermal treatment alternative, but final management of contaminants would still be required. The costs associated with maintenance of the storage systems can be expected to increase as major repair of the storage facilities becomes necessary.

Community Acceptance

This evaluation criteria addresses the degree to which members of the local community support the remedial alternatives being evaluated.

A public comment period was conducted from July 26, 1991, through September 3, 1991, for the Feasibility Study for Final Management of TCDD-Contaminated Materials and Proposed Plan for Final Management of Dioxin-Contaminated Soil for the Bliss-Ellisville Site. A public meeting was conducted on August 22, 1991, in Ellisville, Missouri, to discuss the Feasibility Study and Proposed Plan. A limited number of comments were received by the Agency during the public comment period.

Oral comments received during the public meeting and written comments received at the Regional office were generally supportive of the Proposed Plan. Many community members were interested in completing the project as quickly as possible to minimize the impact to their community.

Some community members questioned the need for remediation in consideration of a recent statement made by an official with the Centers for Disease Control. A representative from the

Agency for Toxic Substances and Disease Registry responded that his agency continues to be concerned about human exposure to dioxin and will continue to support actions to minimize these exposures.

A responsiveness summary has been prepared which presents EPA's response to all comments received during the comment period.

Considerable public involvement preceded the 1988 Times Beach remedy selection and entry of the 1990 Consent Decree, which have established treatment capacity at Times Beach for the materials at the Bliss-Ellisville site.

The local community near Times Beach has demonstrated divided support for the various alternatives evaluated for management of Times Beach contaminants, and materials from other locations. These local concerns have primarily focused on short-term remedial action impacts and aesthetic impacts. Many residents in close proximity to Times Beach perceive the implementation of any disposal or thermal treatment alternatives implemented at Times Beach as a threat to the economic development and stability of their community. Some residents have proposed a cover or cap over contaminated areas at Times Beach, either as a final remedy, or as an interim remedy pending development of alternative technologies.

Other local residents have indicated support of centralized thermal treatment of soils from Times Beach and other eastern Missouri dioxin sites due to the long-term protection and overall benefit which would be provided to the St. Louis area. After consideration of the comments received, and on the basis of other remedy selection criteria, a Record of Decision was issued by EPA on September 29, 1988, selecting thermal treatment of dioxin-contaminated materials from a designated group of eastern Missouri dioxin sites at Times Beach.

State Acceptance

The State acceptance criteria addresses the concern and degree of support that the State government has expressed regarding the selected remedial alternative. The Proposed Plan was provided to the State for comment in accordance with statutory provisions of SARA, Section 121(f)(1)(G).

The State transmitted written comments regarding the Feasibility Study and Proposed Plan to EPA on September 17, 1991. In these comments, the State indicated general concurrence with the proposed remedy, contingent upon EPA's commitment to perform a ground water investigation at the site and assurances that

stabilization measures will be maintained or implemented, as necessary. In August 22, 1991 correspondence to MDNR, EPA committed to perform an investigation of the ground water at the site. The Responsiveness Summary accompanying this Record of Decision reaffirms EPA's commitment to perform a ground water investigation and to assess the need for interim stabilization measures at the site prior to implementation of the final remedy. EPA is committed to performing response actions that are determined to be necessary to control offsite migration of contamination prior to the final remedy.

The State has historically supported thermal destruction of dioxin-contaminated soils excavated from the eastern Missouri dioxin sites at a central location. Support of this concept was initially advanced by former Missouri Governor Christopher Bond in December 8, 1982, correspondence to EPA. In this correspondence, it was requested that contaminated soils be excavated and that the possibility of incineration should be explored.

On February 14, 1983, Governor Bond, by executive order, established a Governor's Task Force on Dioxin. The task force submitted its final report on October 31, 1983, recommending that dioxin-contaminated soil at sites in Missouri be excavated and stored until a proven technology is available to assure a comprehensive and permanent solution to dioxin contamination with minimum risk to public health and the environment.

In correspondence of May 7, 1986, the State requested that EPA evaluate Times Beach for establishment of a centralized thermal treatment facility to accept dioxin-contaminated soils from designated sites in eastern Missouri. This alternative was included in the September 1986, Times Beach Feasibility Study.

The State of Missouri is a signatory to a Consent Decree with the United States of America and the Syntex defendants named in the U.S. v. Bliss civil action previously described. This Consent Decree provides for implementation of a comprehensive remedy for the designated eastern Missouri dioxin sites, including the Bliss-Ellisville site. Under the mixed-work arrangement, EPA, the State of Missouri, and Syntex share responsibilities for implementation of the overall project. The State-approved Consent Decree provides a means of implementing the remedy selected in this Record of Decision.

IX. THE SELECTED REMEDY

The Agency is selecting Alternative 4, excavation and transportation of dioxin-contaminated soils to Times Beach for thermal treatment. Following excavation and transportation of

dioxin-contaminated materials, final management of the non-dioxin site contaminants will proceed, as specified in the 1986 ROD for the Bliss-Ellisville site. Following removal of all site contaminants, the site will be restored to enable beneficial use.

Residues from the thermal treatment of dioxin-contaminated materials will be disposed at Times Beach as non-hazardous solid waste if testing verifies that delisting criteria are achieved. If delisting criteria are not achieved, the materials will be retreated at Times Beach, or managed offsite as a hazardous waste. Following thermal treatment of dioxin-contaminated materials from the designated eastern Missouri sites, the temporary thermal treatment unit will be permanently removed from Times Beach.

The selected alternative, transport and thermal treatment of dioxin-contaminated soils at Times Beach, provides the highest degree of long-term protection of human health and the environment of the alternatives evaluated. Thermal treatment destroys dioxin contamination, eliminating the potential for future exposure in excess of health-based levels.

The selected remedy satisfies the statutory preference for remedies involving treatment which result in the permanent reduction of the volume, toxicity, or mobility of hazardous substances. Thermal treatment destroys the dioxin contamination, thereby eliminating the toxicity of the contaminated soil. Since the dioxin contamination is destroyed, the mobility and volume of the contamination is also eliminated. The containment and storage alternatives evaluated reduce the mobility of the contaminated soil, although not to the extent provided by thermal treatment. Containment or storage do not reduce the toxicity or the volume of hazardous substances.

X. STATUTORY DETERMINATIONS

Based upon available information, the selected remedy satisfies the remedy selection requirements under CERCLA, as amended by SARA and the National Contingency Plan. The remedy provides protection of public health and the environment, achieves all applicable or relevant and appropriate requirements, is cost-effective, utilizes permanent solutions to the maximum extent practicable, and satisfies the statutory preference for remedies involving treatment as a principal element.

Protection of Public Health and the Environment

The selected remedy for the Bliss-Ellisville site provides a high degree of protection of public health and the environment and permanence. No other alternative identified offers an

equivalent degree of long-term protection. The selected remedy is the only alternative identified which permanently attains the level of cleanup recommended for the Bliss-Ellisville site by state and Federal health agencies.

The primary environmental concern at the Bliss-Ellisville site is the potential release of dioxin-contaminated soil into the environment and subsequent exposure to environmental receptors. Continued monitoring and maintenance pending implementation of the selected remedy will control the potential for release. Any spills of contaminated materials which may occur during transport of materials to Times Beach can be immediately and effectively cleaned up, and the spilled contaminated materials transported to Times Beach for treatment. The selected remedy involves thermal treatment which permanently destroys the site contaminants. Once destroyed, the potential for exposure is eliminated.

Attainment of ARARs

The selected remedy will achieve the provisions of all applicable, or relevant and appropriate requirement (ARARs) for the protection of public health and the environment. Thermal treatment at Times Beach can be performed in compliance with hazardous waste management requirements under RCRA and HWML, emissions requirements under the federal and state clean air laws and federal and state clean water laws, and all applicable transportation requirements. Primary requirements to be met for the thermal treatment of soil include demonstration of six-nines destruction and removal efficiency and delisting of the thermal treatment residue. Prior experience by the Agency with the EPA mobile incinerator in southwest Missouri and other similar projects has indicated that these requirements can be achieved with commercially-available thermal treatment technologies.

Preference for Treatment

The selected remedy satisfies the statutory preference (established by SARA) for remedies involving treatment which result in the permanent reduction of the volume, toxicity, or mobility of hazardous substances which constitute the principal threat at the site. Thermal treatment destroys the dioxin contamination, thereby eliminating the toxicity of the treated soil. Since the dioxin contamination in the treated soil is destroyed, the potential mobility of this contamination is also eliminated.

Cost Effectiveness

Centralized thermal treatment of contaminated soils from the designated eastern Missouri dioxin sites provides substantial economies of scale, resulting in a cost-effective comprehensive remedy for the identified eastern Missouri dioxin sites. Although the selected remedy has the highest associated cost of any of the alternatives evaluated, no other remedial alternative provides this high level of protection at a lesser cost. In consideration of the benefits provided by thermal treatment, the selected remedy has been determined to be cost-effective.

XI. DOCUMENTATION OF SIGNIFICANT CHANGES

The EPA has selected a remedy consisting of treatment of dioxin-contaminated soil at a temporary thermal treatment facility to be operated at Times Beach. This selected remedy is identical to the remedy proposed in the Proposed Plan of August 24, 1990.

RESPONSIVENESS SUMMARY

**RECORD OF DECISION
FOR
FINAL MANAGEMENT OF
DIOXIN-CONTAMINATED MATERIALS**

and

AMENDMENT

TO

SEPTEMBER 29, 1986

RECORD OF DECISION

ELLISVILLE AREA SITE (BLISS PORTION),

ST. LOUIS COUNTY, MISSOURI

Prepared by

U.S. ENVIRONMENTAL PROTECTION AGENCY

September 27, 1991

RESPONSIVENESS SUMMARY

Record of Decision for Final Management of Dioxin-Contaminated Materials and

Amendment to September 29, 1986 Record of Decision

Bliss-Ellisville Site St. Louis County, Missouri

INTRODUCTION

A public comment period for the Proposed Plan for Final Management of Dioxin-Contaminated Soil and the Feasibility Study for Management of TCDD-Contaminated Materials for the Bliss-Ellisville site was conducted from July 26, 1991 through September 3, 1991. A public meeting to present the Proposed Plan and Feasibility Study was conducted on August 22, 1991, at the Daniel Boone Library in Ellisville, Missouri. The original closing date of the public comment period was extended to allow more time for comments following the public meeting.

This document presents the responses of the Environmental Protection Agency (EPA) to comments received during the public comment period for the Feasibility Study and Proposed Plan. Comments have been grouped into categories of those received at the public meeting, written comments received at the Regional Office, and written comments received from the State of Missouri.

COMMENTS RECEIVED AT THE PUBLIC HEARING

In this section, the public comments received by EPA at the public hearing on August 22 are summarized. EPA responses to the comments are provided.

A commentor noted the path next to the site does not have any warning signs posted. He also noted he had seen children playing near the fence and had

seen sections of the fence which have been bent down where intruders had apparently tried to gain access to the site.

EPA requested the commentor to point out the specific area of concern, and indicated that action would be taken to maintain safety and security. Subsequent to the meeting, an EPA representative visited the site to inspect the fence for signs of intruders. Two areas were noted where erosion has created an opening beneath the fence. Measures will be taken to secure these areas. The fence is currently posted with warning signs. Additional signs will be considered for the areas of concern.

A commentor questioned why the original contaminated soil volume estimate of 20,000 cubic yards had been revised to 7,000 cubic yards.

EPA told the commentor the revised figure of 7,000 cubic yards was based on recent statistical sampling which determines concentrations at a 95 percent upper confidence level. Earlier estimates were based on non-statistical samples collected in 1982 and 1983. The recent sampling we performed, which involves determining 95 percent upper confidence level measures, is the method which is used to guide excavation during the actual site cleanup, and provides a more accurate basis upon which to estimate projected soil volumes. For that reason, the projected soil volume has been adjusted to 7,000 cubic yards.

A commentor wanted to go on record indicating he supports the thermal program. He had spoken with a representative from the University of Missouri at Columbia who told him the only effective way to deal with the problem was to thermally process it.

EPA indicated they appreciated his comments.

EPA was asked why the site can't be fenced in and left alone because of the uncertainty surrounding the toxicity of dioxin.

EPA has relied upon the recommendations of Federal and State health agencies establish the need for response actions at the eastern Missouri dioxin sites. The proposed actions at the Bliss-Ellisville site continue to be supported by these health agencies. The Agency for Toxic Substances and Disease Registry has prepared an agency position paper on the toxicity of dioxin (Attachment 1).

A commentor wanted to know if dioxin is so dangerous, why is EPA letting people rent the property.

Federal and state health agencies have not recommended relocating residents at the site. The EPA has installed a perimeter fence and posted warning signs in an attempt to limit exposure. Residents at the site are aware of the hazard and choose to remain.

A commentor said they were not aware of the dioxin until after they moved into their homes. Commentor noted she lived in an older section of the adjacent subdivision - perhaps 10 or 11 years old.

The Ellisville Area site was added to EPA's National Priorities List in 1981. During the period when the State originally was the lead agency for this site, site stabilization measures were taken and perimeter fencing was installed to limit access and exposure potential. EPA completed the perimeter fence when the extent of the surface contamination had been defined by the 95 percent confidence sampling. MDNR noted at the public meeting that at the time that the site was discovered, and in the early stages, many of the homes now near the site were not yet constructed. In recent years, development has been approaching the site, and a decision was made to take additional measures to limit access.

A Commentor - State Representative Linton - noted that EPA had spent \$30 million on the buy-out at Times Beach, over \$400 million in research on dioxin, and about \$120 million on an incinerator. He stated his position that the agreement between EPA, Syntex and the Department of Natural Resources had been negotiated in secrecy. He also noted that EPA was trying to change directions at the Bliss-Ellisville site by eliminating the interim storage remedy. Representative Linton described how he perceived the site safety precautions at Times Beach to be less stringent now than when the site was initially discovered, and noted that a letter has been written to MDNR asking for an explanation as to why the project was proceeding in consideration of recent statements made by an official with the Centers for Disease Control.

The permanent relocation of businesses and residents at Times Beach was announced in 1983. EPA made this decision on the basis of recommendations from the Centers for Disease

Control. The EPA must make decisions to take response action on the basis of the best scientific information available at the time. EPA believes that the permanent relocation of residents at Times Beach was warranted on the basis of recommendations from the Federal health agency.

EPA does not dispute that a substantial amount of money has been directed at research into the toxicity of dioxin. It is worth noting that despite the tremendous amount of resources directed at this topic, there still remains a great deal of disagreement in the scientific community regarding the toxicity of dioxin.

A Record of Decision issued by EPA in 1988 selected centralized thermal treatment at Times Beach and established the availability of this thermal treatment unit to treat dioxin-contaminated soils from the Bliss-Ellisville site. EPA has determined that this remedy best attains the remedy selection criteria under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Contingency Plan, including cost effectiveness.

The Consent Decree between the Federal government, the State of Missouri, and Syntex entities was negotiated under a confidentiality agreement. The City of Eureka was invited to participate in the negotiations, but declined. Prior to entry of the consent decree, a public comment period was conducted, and a responsiveness summary was prepared. It should be noted that this consent decree did not select any portion of the remedy for any site in eastern Missouri. The thermal treatment unit at Times Beach was established by a Record of Decision issued by EPA in 1988 in a remedy selection process which included public comment. Likewise, the final remedy for the Bliss-Ellisville site is the subject of the current remedy selection process. The consent decree with Syntex provides a means to implement certain remedies, if selected by EPA.

EPA acknowledges that the interim storage phase will be eliminated at the Bliss-Ellisville site by the current remedy. EPA has determined that the selected remedy is protective of human health and the environment, and satisfies all other remedy selection criteria.

Health and safety procedures at Times Beach continue to be conducted in accordance with an approved Health and Safety Plan which assures protection of site workers and visitors. EPA acknowledges that a letter was written to MDNR from several local officials. The response of MDNR and the Missouri Department of Health is attached (Attachment 2).

Representative Linton acknowledged that Governor Ashcroft had written a letter to the City of Eureka inviting their participation in the ongoing negotiations with the Syntex entities, and had been assured that the local community would have input into the process.

EPA believes that the public was given an opportunity for input into the proposed Consent Decree. Prior to entering the consent decree in Federal Court, a public comment period was announced, and a responsiveness summary was prepared which addressed all comments received.

Representative Linton noted they wanted to ask questions during the preparation of the document and they were not given that opportunity.

MDNR noted at the public meeting that G. Tracy Mehan, Director of the Department of Natural Resources, invited both the City of Eureka and Fenton to intervene in the lawsuit. They declined to intervene.

Representative Linton stated that the Cities of Eureka and Fenton are primarily worried about a permanent dioxin incinerator installation.

Controls have been put into the Consent Decree which prevent the temporary thermal treatment unit at Times Beach from becoming a permanent facility. These include permit restrictions and actual language in the Consent Decree which establishes milestones and requires removal of the unit and site restoration following completion of the project. In addition, the State of Missouri has developed a five-point plan directed specifically at limiting operation of the thermal treatment unit at Times Beach to only dioxin-contaminated soils from the eastern Missouri dioxin sites.

Representative Linton noted that to handle the amount of soil that's going to be brought to Eureka, the incinerator will have to be constructed and then torn down, unlike the Blue Goose which is a mobile unit.

EPA acknowledges that the EPA Mobile Incineration System, sometimes referred to as the Blue Goose, does not have sufficient capacity to be considered for use at Times Beach. However, transportable thermal treatment units are available for projects of this size, and it is anticipated that one of these existing units will be temporarily utilized at Times Beach.

A commentor asked if there had been any testing at the Bliss site since August of 1990.

EPA responded that the 1990 sampling is the most recent testing for dioxin which has been conducted at the Bliss-Ellisville site.

A commentor asked if there are any plans for future testing prior to removal of the dioxin.

EPA noted there would be a continued need to assess the site to make sure conditions do not deteriorate. Presently, there has not been any detected offsite migration of any contamination.

EPA was asked in what year the thermal treatment at Times Beach of dioxin-contaminated soils from the Bliss-Ellisville site would be performed.

EPA explained that under the terms of the Consent Decree, Syntex is the party that's responsible for bringing a thermal treatment onsite and temporarily operating it in order to destroy the dioxin contamination and the soils from the 28 sites. Their first step is the procurement of the contractor to provide these services, then apply to EPA and the State for a permit. The permitting process includes an opportunity for public involvement and an agency review process prior to issuance of a permit. It could be from one to three years before a permit could be issued, but it is not possible to project a certain date since approval of the permit application is required.

Worse site first will be a likely approach to prioritizing sites for thermal treatment at Times Beach once the thermal treatment unit becomes operational. Since there is continued exposure potential at the Bliss-Ellisville site, EPA will consider removing that material early in the process, perhaps by 1995 or 1996.

EPA was asked about the non-dioxin contaminants on the site. There is no mention to dispose of them.

The current remedy selection process addresses only the dioxin-contaminated surface soils. EPA noted there was a final remedy selection for the non-dioxin contaminants in 1986. At that time, EPA decided those materials would be excavated and transported offsite for treatment or disposal at an offsite facility. At the Bliss-Ellisville site, there is surface dioxin-contamination in some areas which must be

removed to access the non-dioxin contamination.

EPA was asked if the non-dioxin contaminants can be removed along with the dioxin.

EPA responded it was currently planned to remove the dioxin and non-dioxin contaminants in a coordinated action.

Several commentors wanted to go on record stating they were in favor of removing the dioxin from the site.

The owner of the Callahan portion of the Ellisville Area Site asked when EPA would complete the cleanup of his property.

The State of Missouri is currently the lead agency for this portion of the site. The State committed to getting the information to the property owner.

A commentor wanted to know if EPA would decide to manage car tires similar to barrels and prohibit their disposal in landfills..

EPA noted the question referred to the new state law that refers to how tires are to be managed. EPA stated that there was provision to use many of the tires as part of a recycling project and part of asphaltting and paving of highways in the State of Missouri. EPA also noted there were places beginning to receive and recycle tires.

State Representative Linton mentioned a law passed last year to set up districts for recycling and reuse.

A commentor asked EPA to identify the non-dioxin contaminants.

The current data indicate that the non-dioxin contaminants are primarily volatile and semi-volatile organic compounds. EPA also stated that some of the buried containers were deposited in the 1970s or earlier, and that bulk disposal of liquid wastes was conducted in pits at the site.

EPA was asked how much soil would be removed and how the site would be restored.

EPA responded that approximately 70,000 cubic yards of dioxin-contaminated soil has already been excavated of the total estimated 100,000 cubic yards. Through this experience, EPA has found that in areas that have not been disturbed since the original application of dioxin-

contaminated waste oil, contamination has not migrated vertically beyond approximately the upper foot of soil. In areas which have been contaminated through migration, contamination is generally limited to the upper several inches. EPA noted sampling would be performed to verify that health-based clean up goals are achieved. Following excavation of contaminated soils, all excavated areas will be backfilled to the original grade and re-vegetated.

A commentor acknowledged the controversy surrounding the carcinogenic properties of dioxin, and asked for comment regarding the fetotoxicity and the teratogenic properties of dioxin.

The representative from ATSDR noted there were a lot of studies going on relating to the effect of dioxin on unborn children, and that his agency is awaiting the results of these studies.

A commentor asked about drums located outside the perimeter of the site. Some drums lie near the retention pond area.

EPA is aware of the possibility that some drum fragments have washed down into that area, but is not aware of the presence of any intact drums. The presence of drum fragments will be assessed and appropriate response actions will be taken in the near future. All buried drums identified at the site will be addressed in the implementation of the remedy for these materials selected in the 1986 Record of Decision. If EPA determines that the presence of these drums presents an unacceptable risk to human health or the environment, interim measures will be considered prior to final management.

A commentor asked when EPA learned of the presence of buried containers that are indicated on a figure in the feasibility study outside the perimeter fence surrounding the site.

EPA told the commentor the information was generated in 1983 when a remedial investigation was performed for the overall Ellisville area site. These locations were overlain over the dioxin map which EPA has more recently generated.

A commentor asked if ground water monitoring had been performed.

Samples were collected in 1990 from two private wells near the Bliss-Ellisville site and from nearby Lewis Spring. These samples were analyzed for volatile compounds. No

volatiles were detected in any of the three samples collected.

In correspondence of August 22, 1991, EPA committed to perform an investigation of the ground water at the Bliss-Ellisville site. A representative from the State Department of Health offered at the public meeting that samples collected by that agency had detected trace levels of TCE, a common industrial solvent, in the local ground water, but that the contamination could not be linked to the Bliss-Ellisville site.

A commentor asked what transport route would be used to haul contaminated materials from the site.

EPA responded that the specific haul routes would be determined during the remedial design. It would appear to be preferable to haul the contaminated materials to Strecker Road for offsite transport rather than bringing the contaminated materials through the more densely populated Turnbury subdivision.

A commentor asked how long excavation of the site would take.

EPA responded that a rate of 100 cubic yards per day would be reasonable to assume. This would result in 70 days of excavation, plus additional time for site mobilization, restoration, and demobilization.

A commentor asked who is liable for the clean up of those materials that are discovered beyond the site perimeter.

The clean up is planned to be conducted as a fund-lead activity. A number of potentially responsible parties have been identified as defendants in ongoing litigation related to this site. Additional information may be discovered when the buried containers are uncovered which may identify additional potentially responsible parties. It is not typical for EPA to pursue homeowners as potentially responsible parties.

A commentor asked if cities were held responsible for cleanup costs.

EPA noted that there have been occasions where cities have operated landfills and have been held responsible. EPA generally attempts to pursue those that are most directly responsible for causing the problem.

A commentor asked why the people purchasing homes in the area were not notified of the existence of the site.

EPA responded that the site was included in EPA's National Priorities List and the Missouri Registry of Abandoned or Uncontrolled Hazardous Waste Sites. In addition, many newspaper articles have appeared regarding this site.

A commentor said she had noticed the tarp in the creek was torn.

EPA acknowledged that the erosion had damaged the liner in the creek in places. EPA will perform an assessment to determine if measures are necessary to stabilize the site to control the potential for offsite migration of contaminants prior to implementation of the final remedy.

A commentor asked if notice would be provided to nearby residents prior to the use of their streets to implement the remedy.

EPA responded that notice would be provided in advance of any response actions involving transport of contaminated materials at the site.

A commentor asked what guarantee existed that the thermal treatment unit at Times Beach would be removed upon completion of the project.

MDNR responded by saying there would be several safeguards built into the incinerator. The unit would be permitted by the State of Missouri. The permit will limit the duration of operation. MDNR stated that under current State law, operation of the unit is limited to five years. Second, the permit will restrict the feedstock to only dioxin-contaminated materials from the designated eastern Missouri sites. Another safeguard is State ownership of the Times Beach property and control over access to the property through a license agreement with Syntex. The license agreement can be revoked at any time. Also the Consent Decree itself provides restrictions on the operation of the thermal treatment unit at Times Beach, making it illegal to exceed the scope of the project. The Consent Decree is enforceable in Federal Court.

COMMENTS RECEIVED FROM THE PUBLIC

A commentor wanted to endorse the thermal treatment of dioxin-contaminated materials at the site.

Water Utility Service Company owns and operates an 8-inch water main that traverses the northwest portion of the Bliss-Ellisville site. Since remedial excavation is planned in this area to remove dioxin-contaminated soils and buried drums, the Water Utility Service Company anticipates that the excavation activities will uncover the existing water main. In order to avoid potential contamination of the public water supply from either existing conditions or the future excavation activities, the Company proposes to permanently abandon that portion of the main within the site. It will be necessary to reconnect the remaining portion of the main at an offsite location. The estimated expense for the proposed reconnection and abandonment is \$34,546. The company is requesting preauthorization approval for this claim to be submitted against the Fund.

Preauthorization of the cost to abandon and relocate the water line cannot be granted by EPA at this time. This action is not included in the selected remedy, and cannot be considered a component of the current remedy selection. In addition, it is unlikely that abandonment of the water main will be required during excavation of the dioxin-contaminated soil. Dioxin contamination at the site is not expected to extend below a depth of approximately one foot. Since the water main is installed at a greater depth, excavation of the dioxin-contaminated soil should not interfere with the main.

It is also uncertain whether the water main crosses areas of non-dioxin contamination. The non-dioxin wastes are generally located in discrete subsurface areas. Depending on the relative dates of water main installation and waste disposal, either the wastes would have been encountered when installing the water main, or the water main would have been encountered when the pits were excavated for disposal of the wastes. It is conceivable that migration of contaminants through the soil could have resulted in the contamination of soils surrounding the water main, but this does not necessarily require abandonment of the main. Soil removal procedures, such as vacuum techniques, exist which are capable of removing the surrounding soil without disturbing the water main.

COMMENTS RECEIVED FROM THE STATE OF MISSOURI

Written comments on the Feasibility Study for Management of TCDD-Contaminated Materials and Proposed Plan for the Bliss-Ellisville site were received from the Missouri Department of Natural Resources (MDNR). These comments and the corresponding EPA responses are included in this section.

EPA has limited the scope of the Feasibility Study (FS) and Proposed Plan for the Bliss-Ellisville site to the management of TCDD (dioxin)-contaminated materials at the site. The proposed remedy affects the management of the non-dioxin contaminated material at the site. We do not believe the two waste streams can really be separated. As a result of decisions made regarding the dioxin, the non-dioxin waste will also be left in place several years before remedial activities commence.

The scope of the feasibility study and proposed plan are appropriately limited to the final management of dioxin-contaminated materials at the site. This is the only remaining component of a comprehensive final remedy for the site. Interim management of dioxin-contaminated materials and final management of non-dioxin-contaminated materials were addressed in the 1986 Record of Decision for the Bliss-Ellisville site.

The current remedy selection does not necessarily delay implementation of response actions for the non-dioxin contamination. Measures to address the non-dioxin contaminants at the site can proceed independently of the dioxin remediation. EPA will conduct investigations to determine if interim measures are required to address the dioxin or non-dioxin contaminants at the site pending implementation of a final remedy. EPA will assess the continued effectiveness of the stabilization measures implemented by the State in 1985. An investigation will also be conducted to determine if site contaminants are migrating to the ground water. Appropriate interim response actions will be conducted to assure protection of human health and the environment pending implementation of the final remedy.

At several points in the FS, it is assumed that the site was only sprayed with dioxin. Due to the unknowns regarding the site history and the "knowns" regarding Bliss's past disposal practices, this assumption may not be a safe one.

The feasibility study considered the non-dioxin contaminants at

the site to the extent that the presence of these materials has an impact on the management of dioxin-contaminated materials. Sampling of dioxin-contaminated areas in the past has not detected the presence of significant concentrations of other contaminants.

In the Remedial Investigation (RI) conducted in 1983, dioxin was found at a 20-foot depth. This indicates, at the least, the dioxin-contaminated materials were disposed of deeper than suspected.

The 1983 Remedial Investigation did report a 2,3,7,8-TCDD concentration of 8.7 ppb in a core sample collected from the 15 to 20 foot depth interval at location ELL-49. Since 1983, EPA has gained considerable experience in the collection of representative subsurface samples for dioxin analysis. The procedures used to collect the 1983 sample that yielded these results are no longer considered valid for the collection of subsurface samples for dioxin analysis. Evaluation of these sampling procedures has indicated that cross-contamination of dioxin between depth intervals occurs, thus invalidating the sample results. Upon review of the sample collection procedures employed in 1983, EPA believes that the 2,3,7,8-TCDD data reported for subsurface samples collected at ELL-49 are not valid due to the likelihood of cross-contamination having occurred.

This may mean the wastes are co-mingled. The issue of whether the wastes are co-mingled is important to the mobility of the dioxin. Dioxin is normally not very mobile, but if it is mixed with substances such as solvents which are present at this site, it can become mobile and migrate to ground water. We have seen this happen at Syntex's Springfield lagoon.

As discussed above, the data collected at the Bliss-Ellisville site to date do not indicate that co-mingling of dioxin with significant concentrations of non-dioxin contaminants has occurred. The situation at the Bliss-Ellisville site is very different from the Springfield site, where dioxin and non-dioxin wastes, including solvents, were co-disposed in an unlined lagoon. Ground water samples collected to date from private wells located near the Bliss-Ellisville site and Lewis Spring have not indicated that contamination is migrating to the ground water.

The ground water situation at the site needs to be characterized in order to determine the advisability of leaving the wastes in place for an extended period of time. The State believes it is

critical to see a specific commitment to perform a remedial investigation of the ground water at the Bliss-Ellisville site in the ROD.

The EPA is committed to performing an investigation of the ground water at the Bliss-Ellisville site. This commitment was reaffirmed in an August 22, 1991 letter from EPA to MDNR (Attachment 3). The ground water investigation will be directed at determining if a release into the ground water is occurring, and if response actions prior to final management of the dioxin wastes are necessary to assure protection of human health and the environment.

It is not appropriate to perform a remedial investigation of the ground water at this time. A remedial investigation is a component of a long-term remedial planning process which includes development of a feasibility study to evaluate various alternatives, development of a proposed plan, public comment on these documents, and remedy selection in a Record of Decision. The ground water investigation would be greatly expedited if it were to proceed under a separate response authority which EPA administers.

Another concern the State has is erosion at the site. It appears that the erosion is occurring near an area where EPA found fairly high levels of dioxin contamination in the borings. Creek A is a losing stream and erosion into it will spread the contamination, threaten ground water, and increase the volume of material to be managed. EPA needs to commit in the ROD to evaluating the erosion problem and performing appropriate interim erosion control measures.

EPA is committed to taking actions that are necessary to protect the health of nearby residents until final management of the dioxin and non-dioxin contaminants is performed. This includes an assessment of the site to determine if additional stabilization measures are required to control offsite migration of contamination. Stabilization measures found to be necessary will be implemented using EPA response authority. Additionally, EPA is required to perform annual removal assessments at sites on the National Priorities List (including Bliss-Ellisville) to determine if response actions are necessary to protect human health and the environment until a final remedy is implemented. This activity will continue.

The feasibility study states that composite water samples showed contamination with hazardous substances in September 1980. This statement would

seem to lend credence to the concern over water quality at the site. It should be explained where these samples were taken.

The feasibility study mentions composite soil samples and water samples. The samples referred to by the State are two discrete surface water samples collected from the Bliss-Ellisville site. One sample was collected from a creek 200 yards east of the arena. The second sample was collected from a pond adjacent to the arena on the west side. Analyses of these samples detected very low concentrations of non-dioxin organic compounds, and do not reflect on ground water quality. This data will be forwarded to the State.

Analytical results of ground water samples collected by EPA in 1990 were not presented in the feasibility study.

Water samples were collected by EPA in 1990 from two nearby private wells and Lewis Spring. These samples were analyzed for volatile compounds. No volatile compounds were detected in any of the three samples. This data will be forwarded to the State.

The stated conclusion that the estimated average depth of dioxin contamination equal to or greater than 1 ppb is about 1.5 feet should not shroud the fact that dioxin has been found at a depth of up to 20 feet.

Sampling conducted at the Bliss-Ellisville site in 1989 and 1990 indicate that dioxin contamination is limited to surface soils. As explained previously, the sampling procedures used in 1983 to collect subsurface samples are not considered reliable for determining the vertical extent of contamination.

The location of the bore holes appearing in Figure 2-5 of the feasibility study should be more precisely identified.

More precise information relating to the locations of the boreholes appearing in Figure 2-5 has been requested, and will be forwarded to the State.

The State would like to review the data from the

1990 sampling of the creek and creek sediments.
Additional sampling may be warranted if none has
been performed since erosion was observed in 1990.

The information requested will be forwarded to the State for
review.

Due to the nature of this site, it is quite
possible that removal of dioxin greater than 4 feet
deep may need to take place as was done at the
Stout site where dioxin contaminated fill material
was found.

Removal of soil at depths greater than four feet at the
Stout site was performed due to the concern for "pockets" of
contamination which could possibly exist in various portions
of the fill area. EPA does not have any information that
would indicate that dioxin-contaminated material has been
used for fill at the site. As explained previously, data
collected in 1989 and 1990 indicate that dioxin
contamination is limited to surface soils.

Cleanup criteria have been established for dioxin-
contaminated surface soils at the Bliss-Ellisville site on
the basis of recommendations from State and Federal health
agencies. Excavation of dioxin-contaminated soils will
continue until reaching a residual concentration of less
than 1 part per billion in the initial foot, less than 10
parts per billion at depths greater than one foot, or
encountering bedrock. Excavation will not proceed beyond a
total depth of four feet. If data becomes available which
indicates that dioxin contamination may exist in discrete
pockets exceeding health-based levels beneath the surface,
or otherwise pose an unacceptable risk to human health or
the environment, this data will be evaluated as new
information, and the need for response measures will be
assessed.