Final Explanation of Significant Differences
Shaffer Landfill
Operable Unit 2, Iron Horse Park Superfund Site

I. INTRODUCTION

A. Site Name and Location

Site Name: Shaffer Landfill, Operable Unit 2
Iron Horse Park

Site Location: Pond Street, Billerica
Middlesex County, Massachusetts

B. Lead and Support Agencies

Lead Agency: United States Environmental Protection Agency

Contact: Don McElroy, RPM
(617) 918-1326

Support Agency: Massachusetts Department of Environmental Protection (MA DEP)

Contact: Janet Waldron
(617) 556-1156

C. Legal Authority for ESD

Section 117(c) of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) requires that, if any remedial or enforcement action is taken under Section 106 of CERCLA after adoption of a final remedial action plan, and such action differs in any significant respects from the final plan, the EPA shall publish an explanation of the significant differences (ESD) and the reasons such changes were made.

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D. Public Record

In accordance with Section 117(d) of CERCLA, the Final ESD will be part of the Administrative Record File, which is available for public review at the two locations listed below at the given times:

EPA Region I Records Center
1 Congress Street
Boston, MA 02114
(617) 918-1440
Monday-Friday: 10:00am - 1:00pm
2:00pm - 5:00pm

Billerica Public Library
25 Concord Road
Billerica, MA 01821
(508) 671-0949
Monday-Thursday: 9:00am - 9:00pm
Friday-Saturday: 9:00am - 5:00pm

II. Summary of Site History, Contamination, Selected Remedy, and Circumstances Leading to an ESD

A. Site History

The entire Iron Horse Park Superfund Site (Site) consists of approximately 552 acres of land in North Billerica, near the Tewksbury town line. The Site is an active industrial complex and railyard with a long history of activities that have resulted in contamination of soils, groundwater, and surface water. The Site includes open storage areas, landfills, and lagoons. A more complete description of the Site can be found in the Phase 1A Remedial Investigation Report (July, 1987).

The Site was placed on the National Priorities List in September 1984 following investigations by the Massachusetts Department of Environmental Quality Engineering (now the Massachusetts Department of Environmental Protection or MA DEP) in the early 1980's and a Site Investigation Report completed by the NUS Corporation for EPA in August 1984.

In August 1984, EPA, under its removal authority, covered a portion of the

Site known as the Johns-Manville Asbestos Landfill with gravel and topsoil to prevent asbestos in the landfill from becoming airborne.

In 1985, EPA began investigations of the Site to determine the nature and extent of contamination. Under the first phase of the evaluation, EPA conducted a broad study of the Site to define the potential problem areas. This study was entitled the Phase 1A Remedial Investigation (RI). As a result of the Phase 1A RI, EPA concluded that the size and complexity of the Iron Horse Park Site necessitated using a phased approach for subsequent, more detailed studies. Under this approach, the Site was separated into a number of different problem areas. Where possible, the areas studied and the decisions on how to clean them up are made as operable units. An operable unit is defined as a discrete portion of an entire response action that, by itself, manages migration or eliminates or mitigates a release, threat of release, or pathway of exposure.

The Boston & Maine Wastewater Lagoons (B&M Lagoons) were grouped together as the first operable unit for the Site. The Record of Decision, which selected the remedy for the B&M Lagoons was signed in September, 1988. In October 1997 the selected remedy was modified by an Explanation of Significant Differences.

The Shaffer Landfill was designated as the second operable unit for the Site. The Shaffer Landfill is located on 106 acres of land east of Pond Street and south of Richardson Pond within the boundaries of Iron Horse Park. The Landfill itself covers approximately 60 acres and was used for disposal of residential and commercial waste for a period of more than 30 years. The Shaffer Landfill is divided into two physically distinct sections. The western section includes approximately 24 acres of landfill and is referred to as the "Residential Section". The eastern section includes approximately 36 acres of landfill and is referred to as the "Commercial Section". A more complete description of the Shaffer Landfill can be found in the Phase 1A Remedial Investigation Report for Iron Horse Park (July, 1987), and the Phase 1C Remedial Investigation Report for the Shaffer Landfill, Iron Horse Park (November, 1989).

B. Contamination Problems

The Shaffer Landfill is an unlined landfill which received a variety of waste for more than 30 years. Over time contaminants have migrated from the waste and impacted groundwater down gradient of the landfill. Twenty-six contaminants of concern, which included both organic and inorganic contaminants, were selected for evaluation in the endangerment

assessment. Although contaminants appear to have affected surface water, sediments and groundwater, an elevated risk was only shown for the potential ingestion of groundwater. Therefore, groundwater cleanup levels were developed for the following contaminants: Arsenic, Benzene, 1,2 Dichloroethane, Methylene Chloride, Pentachlorophenol, 1,1,2 Trichloroethane, Trichloroethylene and Vinyl Chloride.

C. Summary of Remedy Originally Described in the Record of Decision

The conceptual remedy described in the ROD consists of reconstruction of the entire landfill cap. Reconstruction will be accomplished by:

1 - **Removing the existing topsoil layer exposing the existing in-place low-permeability soil;**

2 - **Raising gas collection well heads as necessary up to reconstructed cap surface level;**

3 - **Adding additional low-permeability soil;**

4 - **Grading of low-permeability soil to:**

a) Provide a 5% grade on the top of the landfill lobes, and

b) Provide a consistent smooth sub-grade on the landfill side slopes;

5 - **Installing an impermeable textured membrane liner over the entire landfill area;**

6 - **Installing a 6-inch drainage layer on top of the textured membrane liner over the entire landfill area;**

7 - **Installing a non-woven filter fabric between the drainage and topsoil layers;**

8 - **Reinstalling the topsoil layer and adding additional topsoil to achieve a topsoil depth of 12 inches;**

9 - **Reinstalling an upgraded surface drainage system;**

10 - **Reseeding of the disturbed areas.**

The remedy will also include:

- **Maintenance of cap, surface drainage system, and landfill gas collection/flare system. If necessary, improvements will be made based upon the protectiveness and effectiveness of these components;**

- **Monitoring of the gas collection/flare system;**

- **Monitoring of groundwater and surface water quality;**

- **Construction, operation, and maintenance of leachate collection facilities;**

- **Off-site treatment and disposal of leachate;**

- **Construction of site perimeter security fence;**

- **Institutional Controls, and;**

- **Post Closure Plan**

D. Summary of Circumstances That Gave Rise to the Need for an ESD

During the Remedial Design process, the design of the leachate toe-drain system (as described in Section III, below) posed a number of difficulties, most importantly disagreement over the final siting of the collection system. There was a dual concern that the toe-drain system a) would be relatively ineffective in collecting leachate from above the groundwater table (as required by the ROD), and b) carried the risk of being inundated by an elevated groundwater table. The first issue would limit greatly the volume of leachate subject to removal while the second issue would potentially necessitate the collection, treatment and disposal of large volumes of relatively clean groundwater.

III. Description of Significant Differences and the Basis for these Differences

A. Significant Differences

The ROD requires collection and disposal of leachate and discusses perimeter toe-drains, sited above the groundwater table. The toe-drains, located around the perimeter at the base of the landfill, operate by

allowing seeps (leachate) to enter the drain pipe, and then collecting the leachate to a central location for treatment and disposal.

Through this ESD, leachate will be collected directly from the interior of the landfill rather than from the perimeter. Approximately 50% of the extraction wells of the landfill gas collection system (already a part of the remedy) will be capable of collecting both gas and leachate. The leachate will be extracted to the collection system using pneumatic (compressed air) pumps. A typical feature of landfills whose elevation rises significantly above the surrounding area, is the existence of a liquid phase mound inside the landfill. This mound lies above the normal level of the groundwater table and is usually described as leachate (precipitation which has percolated through landfill waste and leached out contaminants). It is this mound which is the target of the collection effort. The significant difference from the ROD in this case is in the method of leachate collection and the probability for a significant increase in the volume of leachate collected.

B. Basis for Change

The change resulting from this ESD will allow access to and removal of a significantly greater volume of leachate than would have been collected by the perimeter toe drains contemplated in the ROD. In addition to direct access to the leachate, extraction directly from the leachate mound utilizing pumps allows control of the system to prevent collection of relatively uncontaminated groundwater in the event that the groundwater table in the area surrounding the landfill rises significantly. The change documented in this ESD will enhance the *Reduction of Toxicity, Mobility and Volume Through Treatment* which is one of the criteria by which EPA evaluates remedies. When compared to the collection of leachate contemplated in the ROD, the *Reduction of Toxicity, Mobility and Volume Through Treatment* will be enhanced by the change documented in this ESD through the expected greater volume of leachate which will be collected and treated for disposal.

IV. Supporting Agency Comments

In a letter to EPA dated September 7, 2000, MA DEP expressed its agreement with the changes documented in the draft ESD.

V. Statutory Determinations

This ESD documents the EPA's modification of the ROD to modify the mechanism for the collection of leachate for treatment.

EPA believes that the remedy as modified herein remains protective of human health and the environment, complies with all Federal and State requirements that are applicable or relevant and appropriate to this remedial action, and is cost-effective. In addition, the revised remedy utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable for this Site.

VI. Public Participation Activities

On February 1, 2000, EPA held a public meeting at the Billerica Town Hall, where the proposed design of the remedy, including the use of the extraction well system for pumping leachate directly from the landfill rather than using toe-drains, was discussed. In addition to the meeting, the Remedial Design including the proposed leachate system design has also been reviewed by the Earthwatch Coalition, Inc., through support by a Technical Assistance Grant from EPA. Information from the public review process has been considered in developing the revised leachate system.

Patricia L. Meaney

Patricia L. Meaney, Director
Office of Site Remediation and Restoration
EPA-New England

9/8/00
Date