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Five-Year Review Report

Second Five-Year Review Report
for
Iron Horse Park Superfund Site
Billerica, Massachusetts

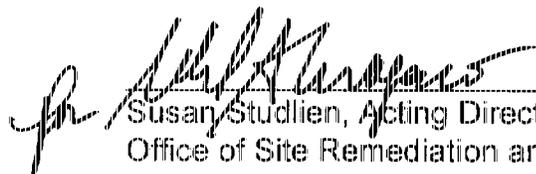
September, 2003

Prepared By:

United States Environmental Protection Agency
Region 1, New England
Boston, Massachusetts

Approved by:

Date:


Susan Studien, Acting Director
Office of Site Remediation and Restoration

9-24-03

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site name (from WasteLAN): Iron Horse Park		
EPA ID (from WasteLAN): MAD051787323		
Region: 1	State: MA	City/County: Billerica/Middlesex
SITE STATUS		
NPL status: Final		
Remediation status (choose all that apply): Under Construction		
Multiple OUs?* Yes	Construction completion date: N/A	
Has site been put into reuse? Partial ecological reuse via wetland replication		
REVIEW STATUS		
Lead agency: EPA		
Author name: Don McElroy		
Author title: Remedial Project Manager	Author affiliation: EPA Region I	
Review period: 6/24/03 to 9/28/03		
Date(s) of site inspection: Multiple in 2002 and 2003		
Type of review: <div style="text-align: right; margin-right: 100px;">Post-SARA</div>		
Review number: 2 (second) **		
Triggering action: Previous (1st) Five-Year Review Report		
Triggering action date (from WasteLAN): September 28, 1998		
Due date (five years after triggering action date): September 28, 2003		

* "OU" refers to operable unit.

** Five-Year Review was completed in 1998

I. Introduction

EPA New England Region has conducted a second five-year review of the remedial actions implemented at the Iron Horse Park Superfund Site in Billerica, Massachusetts. This review was conducted from June 2003 through September 2003. This report documents the results of the review. The purpose of the five-year review is to determine whether the remedy at a site is protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in five-year review reports. In addition, five-year review reports identify deficiencies found during the review, if any, and identify recommendations to address them.

This review is required by statute. EPA must implement five-year reviews consistent with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). CERCLA 121(c), as amended, states:

If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented.

The NCP part 300.430(f)(4)(ii) of the Code of Federal Regulations (CFR) states:

If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action.

This is the second five-year review for the Iron Horse Park Site. The triggering action for this review is the first five-year review which was signed on September 28, 1998. Due to the fact that hazardous substances, pollutants, or contaminants remain at the site above levels that allow for unrestricted use and unlimited exposure, a five-year review is required.

II Background

The Iron Horse Park site, located in Billerica Massachusetts near the Tewksbury town line (see map), is a 553-acre industrial complex which includes manufacturing and railyard maintenance facilities, open storage areas, landfills, and wastewater lagoons. A

long history of activities at the site, beginning in 1913, has resulted in the contamination of soil, groundwater, and surface water. The Iron Horse Park site is bounded on the north by the B&M railroad tracks, on the west by High Street and an auto salvage yard, on the east by Gray Street, and on the south by a wetland, Pond Street, and the Middlesex Canal. The Middlesex Canal flows through the Site to the east, where it joins Content Brook at the southeastern edge of the Shaffer landfill. There are abundant wetlands at the Site.

The Iron Horse Park Superfund Site was historically surrounded by residential properties and wetlands. This situation remains today and is expected to continue in the future. The majority of the Site itself has been historically utilized for commercial and industrial purposes with an emphasis on rail related activities. The commercial and industrial uses at the Site are expected to continue in the future.

The Iron Horse Park site was listed on the NPL in 1984. In 1984, prior to final placement on the NPL, EPA conducted a removal effort, capping a 15 acre asbestos landfill. This area had been used as a landfill for asbestos sludge and other asbestos mill wastes generated by the Johns-Manville Products Corporation, which had a facility within Iron Horse Park. EPA capped this landfill in 1984 as part of an "Immediate Removal Action" under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

Following an initial site wide Remedial Investigation (Phase 1A RI; CDM, 1987), the site was divided into three operable units (OUs). Although part of the same NPL listing, each operable unit is essentially an independent site with separate usage and contamination histories. OU1 - the B&M Wastewater Lagoons, currently in remedial action, consists of a former 15 acre wastewater lagoon area, OU2 - the Shaffer Landfill, also in remedial action, is a 60-acre landfill and OU3 - consists of the rest of the site. EPA has not yet selected a remedy for OU3. Although some information regarding OU3 will be presented in this review, OU3 will not be the subject of a protectiveness finding.

OU3 is characterized by numerous potential source areas, an extensive wetland system, multiple property owners, a complex history and widespread environmental impacts. This area of the site exhibits widespread environmental impacts to soils, sediment, surface water and groundwater. OU3 is currently a Remedial Investigation/ Feasibility Study (RI/FS). EPA has conducted a risk assessment for both human health and ecological receptors. Each potential source area in OU3 is unique and in fact each area underwent an independent risk assessment. Under current and future exposure scenarios, there are numerous areas where the EPA risk range is exceeded. Although the magnitude of the exceedance is typically not very large, remedial action to address and manage or eliminate the risk will be required. A Record of Decision (ROD) selecting a remedy for OU3 is anticipated in 2004.

Part A - OU1 - B&M Wastewater Lagoons

II(A) Background - OU1

OU1 - the B & M Wastewater Lagoons is an approximately 15 acre area which consisted of 5 unlined lagoons. The lagoons were constructed and put into operation in 1915. During operations (until 1992), the lagoons received industrial and sanitary wastewater and some stormwater from the Iron Horse Park industrial complex via a piping system. The lagoons were dredged numerous times, with the material being placed in soil stockpiles adjacent to the lagoons. A focused Remedial Investigation was conducted at OU1 in 1988 to determine the nature and extent of contamination in and around the B&M Lagoons (Phase 1B RI; CDM, 1988).

Hazardous substances which have been released at OU1 in the following media include:

<u>Soil</u>	<u>Lagoon Sediment</u>
PAHs	PAHs
Antimony	Antimony
Arsenic	Arsenic
Cadmium	Cadmium
Chromium	Chromium
Lead	Lead

III(A) OU1 - Chronology

DATE	EVENT
1915 (approx)	Lagoons begin operation
1915-1992	Lagoons receive wastewater. Periodically, material is dredged and placed in piles adjacent to lagoons
1988	EPA completes Remedial Investigation/Feasibility Study
1988	EPA signs Record of Decision choosing bio-remediation of soil/sludge as the remedy.
1990	Settlement reached via Consent Decree with Boston & Maine Corporation agreeing to perform cleanup.
1991	Remedial Design approved
1991(November)	Remedial Action initiated
1992	Discharges to the Lagoons cease
1991-1996	Bio-remediation remedy conducted. Progress slower than anticipated.
1997	EPA issues Explanation of Significant Differences (ESD) - revising remedy to Asphalt Batching
2002	Removal of final load of contaminated material
2003	Presumed final round of confirmatory sampling to demonstrate completion of cleanup work
2003	Draft Summary Report submitted to document completion of the Remedial Action.

IV(A) Remedial Actions - OU1

A. Remedy Selection - OU1

On September 15, 1988 EPA signed a Record of Decision (ROD) choosing the remedy for OU1. The remedy included the following:

- Excavating lagoon sediments and contaminated soil piles to a constructed treatment cell;
- Treating the contaminated material from the lagoons by bioremediation;
- Returning the treated material to the lagoon area, covering it with clean soil, and establishing a vegetative cover; and,
- Decontaminating the lagoon system's piping and pumps.

B. Remedy Implementation - OU1

In a Consent Decree (CD) which was entered on September 13, 1990, Boston and Maine agreed to perform the remedial design/remedial action (RD/RA). The CD also established the following performance standards for the bioremediation remedy:

- A. 60-80% removal (or ≤ 1 ppm) of total PAHs;
- B. 50-60% removal of total petroleum hydrocarbons (TPH)

TPH cleanup requirements were subsequently quantified (in July, 1993), in alignment with Massachusetts requirements, at 5,000 ppm. This cleanup level is consistent with non-residential use

In the fall of 1991 the first contaminated material was placed into the bioremediation treatment cell. In the fall of 1994, as required by the ROD, the lagoon system distribution piping was removed, decontaminated, and sent off-site for recycling. The treatment process for contaminated soils and sediments was significantly slower than predicted and had difficulty in achieving cleanup levels. In 1996 it was determined that bioremediation would not achieve the PAH cleanup criterion in a timely manner. As a result, EPA initiated an evaluation of alternatives to bioremediation which resulted in the issuance of an Explanation of Significant Differences (ESD) revising the remedy. The ESD for OU1 was signed by EPA on October 1, 1997.

The revised remedy specified in the ESD includes the following:

- C. Excavation of contaminated material, and transport off-site to an asphalt batching plant for treatment;
- D. Implementation of protective measures during excavation and transport of contaminated material, to prevent the creation of excess dust and spillage; and

- E. Verification sampling to ensure that all material requiring treatment has been excavated and that any material left at the lagoons does not contain contamination above cleanup criteria.

Following the ESD, an Asphalt Batching Work Plan was prepared to document activities to be conducted to implement the revised remedy. These activities included:

- A. Targeting soil removal areas;
- B. Soil Disposal Characterization sampling;
- C. Test pit excavation; and
- D. Post-excavation confirmatory sampling.

Soil areas to be remediated were delineated based on a review and evaluation of historical soil characterization data as well as data collected in the early fall of 1997. Data were also used to characterize soils for acceptance at a soil recycling facility. Soil removal activities were conducted in October and November 1997 and were documented in a February 1998 report entitled, "Soil Excavation and Asphalt Batching Report".

In October 2000, additional soil excavation and confirmatory sampling were conducted. The purpose of this effort was to gather confirmatory samples to assess whether additional excavation was necessary and to evaluate potential risks associated with metals in soil. The results of the field work demonstrated that additional soil removal and re-sampling would be necessary.

In December 2001, the following activities were performed at the site:

- E. Limited additional excavation of soil piles;
- F. Collection of confirmatory soil samples for PAH and TPH; and
- G. Collection of limited confirmatory samples for lead.

The soils excavated in December 2001 were stockpiled at the site. In August 2002 the stockpiled soils were transported off-site for asphalt batching.

C. Operation and Maintenance - OU1

Upon completion of the remedial action, all contaminants above cleanup requirements

will have been removed from the Site. Therefore, it is anticipated that there will be no Operation and Maintenance requirements at OU1.

V(A) Progress Since Last Five-Year Review - OU1

The previous Five-Year Review for Iron Horse Park was completed in 1998. Since that time, the balance of the remedy at OU1 has essentially been completed. As discussed above, the activities to complete this remedy have included: removal of additional soils and sediment for asphalt batching off-site and confirmatory sampling to demonstrate that cleanup levels have been achieved. In addition, an asbestos deposit was discovered and removed for disposal in 2003.

VI(A) Five-Year Review Process - OU1

The Iron Horse Park five-year review was led by Don McElroy of EPA, Remedial Project Manager for the Iron Horse Park site. Janet Waldron of the Massachusetts Department of Environmental Protection (MADEP) assisted in the review as the representative for the support agency.

This five-year review consisted of a review of relevant OU1 documents (see Attachment 1), review of cleanup standards and consultation with risk assessment personnel.

A Technical Assistance Grant (TAG) was granted to Earthwatch Coalition. In its capacity as a TAG recipient, Earthwatch hired a consultant to assist in the review of Site related documents. Earthwatch has been engaged in the remedial process and is up to date on the completion of Remedial Action activities.

Inspection

Remedial activities (summarized above in the Remedy Implementation section) have occurred on numerous occasions over the past several years as has been described. These remedial activities have been accompanied by numerous site visits and/or inspections by EPA and MADEP, including during 2002 and 2003. During the most recent inspections, virtually all contaminated material had already been removed from the site and the activities witnessed during these inspections were related to confirmatory sampling. As there were very limited activities occurring, and as there was no "constructed" remedy on-site to inspect, a formal inspection was not conducted.

VII(A) Technical Assessment - OU1

Question A: Is the remedy functioning as intended by the decision documents?

The review of documents, ARARs, risk assumptions and the results of site inspections, indicate that the OU1 remedy has proceeded as intended by the ROD as modified by the ESD. Since no contaminated material above cleanup levels will be left at OU1, there will be no ongoing remedy to "function". While the "construction" of the remedial action (which entails all cleanup activities) has not yet been formally completed, completion will be accomplished by review and approval of the Site Summary Report, which has been recently submitted by the Settling Defendant.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy selection still valid?

The exposure assumptions used to evaluate risk at OU1: current worker, future worker and future resident exposure to contaminated soil and sediment, are still valid, if not extra conservative in the case of the future resident.

The RAOs (at the time of the ROD these were called "remedial response objectives") were developed in response to existing or future risks and were utilized to develop remedial alternatives to address those risks. The RAOs for OU1 are:

- To protect human health and the environment by stopping the ongoing discharge to the lagoons;
- To protect human health and the environment by reducing current and future risks due to contaminant levels found in soils and sludges from the B&M Lagoons;
- To protect human health and the environment by reducing current and future risks due to releases of contaminants to groundwater, surface water and air; and
- Meet State and federal applicable or relevant and appropriate environmental requirements (ARARs).

These RAOs and the risk based cleanup levels for OU1 are still valid.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

No other information has come to light that could call into question the protectiveness of the remedy at OU1.

Technical Assessment Summary

The Remedy at OU1 has been conducted as intended in the ROD, as amended by the ESD.

The ROD for OU1 cited a very limited list of ARARs. The ARARs cited all had relevancy to conducting the remedial action and do not have current relevancy as the action is essentially complete. The First Five-Year Review for Iron Horse Park (1998), mistakenly include the Safe Drinking Water Act (SDWA) as an ARAR. The SDWA, which is typically utilized to established cleanup levels for groundwater, was not cited as an ARAR in the ROD for OU1.

The exposure assumptions used to develop the Human Health Risk Assessment included both current exposures (worker) and potential future exposures (worker and resident). These assumptions are considered to be conservative and reasonable in evaluating risk and developing risk based cleanup levels. No change to these assumptions or the cleanup levels developed from them is warranted.

Because all material with contamination above cleanup levels has been removed from OU1, there will be no "operating" or "functioning" remedy. Upon review and approval of the Site Summary Report, which has been recently submitted by the Settling Defendant, the Remedial Action at OU1 will be considered complete.

VIII(A) Issues - OU1

There are no current issues which would prevent the remedy at OU1 from being considered protective. As required in the ROD and the CD, land use restrictions will need to be established at OU1. While numerous commercial and industrial uses of OU1 may be appropriate, residual TPH levels do not allow for unrestricted use.

IX(A) Recommendations and Follow-up Actions - OU1

No recommendations or follow-up actions have been identified at OU1 other than the land use restrictions discussed above.

Part B - OU2 - Shaffer Landfill

II(B) Background - OU2

OU2- Shaffer Landfill is an approximately 60 acre former landfill, which was used for disposal of residential and commercial waste for more than 30 years. Shaffer Landfill stopped receiving waste in 1986. The landfill, which consists of two lobes, is located on a 106 acre property which is bordered by Pond Street to the west, the railroad tracks to the north, Gray Street to the east and the Middlesex Canal to the south. A focused Remedial Investigation was conducted at OU2 in 1989 to determine the nature and extent of contamination in and around the Shaffer Landfill (Phase 1C RI; CDM, 1989)

Hazardous substances which have been released at OU2 in the following media include:

Groundwater

Arsenic
Benzene
1,2-Dichloroethane
1,2-Dichloroethene
Ethylbenzene
Methylene Chloride
Toluene
1,1,2-Trichloroethane
Trichloroethene
Vinyl Chloride
Xylene

Sediment

acetone
toluene
PAHs
arsenic
lead
zinc

Surface Water

barium
mercury
lead
nickel
arsenic
chromium

III(B) OU2 - Chronology

DATE	EVENT
From about 1946	Open burning dump
1966	Property purchased by Shaffer Realty Corporation
1966 - 1984	Waste disposal operations at a significant level
1986	Waste disposal operations cease
1989	EPA completes Remedial Investigation
1991	EPA completes Feasibility Study
1991	EPA signs Record of Decision choosing remedy for Shaffer Landfill
1994	EPA reaches settlement (AOC) with PRP group to conduct Remedial Design
2000	Remedial Design Completed
2000	Settlement via Consent Decree. PRP group agrees to perform Remedial Action
2001	Remedial Action Started
2003	Construction Activities Complete (projected for September 2003)

IV(B) Remedial Actions - OU2

A. Remedy Selection OU2

On June 27, 1991 EPA signed a ROD choosing the remedy for OU2. The remedy, reconstructing the landfill cap, determined that reconstruction would 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; and
- 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.

Groundwater is the only media for which cleanup levels were established in the ROD. Those cleanup levels are as follows:

Arsenic	50 ppb
Benzene	5 ppb
1,2 Dichloroethane	5 ppb
Methylene Chloride	5 ppb
Pentachlorophenol	1 ppb
1,1,2 Trichloroethane	3 ppb
Trichloroethylene	5 ppb
Vinyl Chloride	2 ppb

B. Explanation of Significant Differences (ESD) - OU2

The ROD contains discussion regarding the leachate collection facilities which conceptualize a toe-drain system constructed to collect liquid from above the groundwater table. During the Remedial Design process, the design of the leachate toe-drain system posed a number of difficulties, most importantly disagreement over the final elevation 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. To reach resolution on September 8, 2000, EPA issued an ESD modifying the remedy. The ESD modified the remedy so that leachate will be removed via extraction wells directly from the interior of the landfill. Under the modified remedy, leachate will still be collected at a central location for treatment and disposal offsite.

C. Remedy Implementation - OU2

The Remedial Design was approved by EPA in the fall of 2000. Also in the fall of 2000, a settlement, via a Consent Decree (CD), was reached with a group of PRPs. Under the terms of the CD, the Settling Defendants agreed to perform the Remedial Action at the Shaffer Landfill implementing the remedy selected in the ROD as modified by the ESD. Construction of the remedy at the Shaffer Landfill began in the spring of 2001. The Remedial Action Work Plan outlined a process whereby one of the landfill lobes would be capped in 2001 and the second lobe would be capped in 2002. Concurrent with the capping process, the other required elements of the remedy would be completed. These other elements included: installation of groundwater monitoring wells; wetland restoration activities; and initiation of periodic (groundwater and surface water) monitoring. The 2001 construction season proceeded as planned, with the substantial completion of construction activities on the first lobe of the landfill. In 2002, a design

change which entailed capping a larger area, as well as the on-set of wet fall/early winter weather, prevented completion of the second lobe. Activities to complete construction have continued in 2003. In July 2003, EPA and MADEP participated in a pre-final inspection for the remedial action. Following the inspection, EPA issued a letter indicating that subject to two conditions, EPA believed that construction was substantially complete. At this time EPA has received and is reviewing the Final Remedial Construction Report. Approval of the Final Remedial Construction Report is necessary for construction activities to be considered complete.

D. Operation and Maintenance - OU2

The Settling Defendants at the Shaffer Landfill have submitted an Operation and Maintenance (O&M) Plan. It is anticipated that O&M will be ongoing. O&M activities are standard for landfills and will include inspections and maintenance of all structures and mechanical systems associated with the cap and the leachate and gas collection systems. In addition, wetlands inspections and maintenance, and periodic monitoring of groundwater and surface water will also be conducted. Under the terms of the Consent Decree, the Settling Defendants will perform the bulk of the required O&M activities for a 40 year period after which the Commonwealth of Massachusetts (the Commonwealth) will assume responsibility for O&M. The exceptions to this are: landfill soil gas migration monitoring; flare compliance monitoring and surface water monitoring. The Commonwealth will take on responsibility for these activities, when the remedy is determined to be "working properly and as designed", as defined in the CD. In addition, depending on how quickly groundwater quality improves, in accordance with the CD, the Commonwealth will take over responsibility for groundwater monitoring activities between 8 and 15 years after the remedy is determined to be "working properly and as designed".

V(B) Progress Since Last Five-Year Review - OU2

Since the Five-Year Review conducted in 1998, OU2 has progressed through almost the entire Remedial Action process. As discussed previously, following approval of the Remedial Design in 2000, construction of the Remedial Action occurred between 2001-2003. At present, review of the Final Remedial Construction Report is underway.

VI(B) Five-Year Review Process - OU2

The Iron Horse Park five-year review was led by Don McElroy of EPA, Remedial Project Manager for the Iron Horse Park site. Janet Waldron of the Massachusetts Department of Environmental Protection (MADEP) assisted in the review as the representative for the support agency.

This five-year review consisted of a review of relevant OU2 documents (see Attachment

2), review of cleanup standards and consultation with risk assessment personnel

A Technical Assistance Grant (TAG) was granted to Earthwatch Coalition. In its capacity as a TAG recipient, Earthwatch hired a consultant to assist in the review of Site related documents. Earthwatch has been engaged in the remedial process and is up to date on the completion of Remedial Action activities.

Inspection

Construction occurred between the spring of 2001 and the summer of 2003. During this time period, there were many site visits and inspections by EPA and MADEP. This included the pre-final inspection, conducted in July 2003, which is a formal step in the completion of construction at OU2.

VII(B) Technical Assessment - OU2

Question A: Is the remedy functioning as intended by the decision documents?

As described above, the construction of the remedy is nearly complete. It is anticipated that the review of the Final Remedial Construction Report will be completed shortly and construction of the remedy will be approved. At present, the review of documents and ARARs and the results of site inspections indicate that the OU2 remedy has been designed and constructed as intended in the ROD, as modified by the ESD. As construction has not officially been completed, there is as yet no post-construction data with regards to groundwater quality. Groundwater quality will be the most obvious and important means of assessing how the remedy is functioning. Other means include, O&M issues/reports, flare and leachate operational issues and assessment of the success of the wetlands replication.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy selection still valid?

The exposure assumptions used at OU2, future use of groundwater, which assumes 70 years of consuming 2 liters per day of water, is still considered valid and conservative. Exposure (via dermal contact and incidental ingestion) by wading on a daily basis from June to September to contaminated sediment in the Middlesex Canal and Content Brook, was evaluated for children ages 6-15. No risk was shown to this receptor group. While still considered valid, this wetland area is being evaluated as part of OU3 in a site wide wetland evaluation.

The groundwater cleanup levels established in the ROD are still valid, with the

exception of arsenic. The MCL for arsenic is now 10 parts per billion (ppb) and if the ROD were signed today, 10ppb is the level that would be set. Although a different, more stringent cleanup level would be established today, the chosen remedy would not be different. If or when the ROD established interim cleanup levels for groundwater are achieved, a risk assessment will be conducted at that time based upon the residual groundwater contamination and utilizing EPA's then-current risk management standards. If necessary, modified groundwater cleanup levels will be established. This will ensure that any cumulative risks, or changes in relative risk of particular contaminants will be identified and that cleanup levels will remain protective.

The RAOs for OU2 which were utilized to develop remedial alternatives are:

- Prevent ingestion/direct contact with Landfill waste contamination;
- Prevent migration of contamination via leachate which would result in groundwater concentrations in excess of federal MCLs, non-zero MCLGs, proposed MCLs and MCLGs, and Massachusetts Groundwater Quality Standards;
- Prevent migration of contamination via leachate to surface waters and sediments to ensure that AWQCs are not exceeded due to the Landfill;
- Prevent damage and loss of wetlands caused by eroding soil from the Landfill cap, and meet all federal and state wetlands protection ARARs;
- Prevent ingestion of water having contamination in excess of federal MCLs, non-zero MCLGs, proposed MCLs and MCLGs, and Massachusetts Groundwater Quality Standards; and
- Restore groundwater aquifer beyond the point of compliance to contaminant concentrations below federal MCLs, non-zero MCLGs, proposed MCLs and MCLGs, and Massachusetts Groundwater Quality Standards.

These RAOs for OU2 remain valid.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

No other information has come to light that could call into question the protectiveness of the remedy.

Technical Assessment Summary

As indicated above, subject to the review and approval of the Final Remedial Construction Report, the remedy appears to have been designed and constructed as intended in the ROD, as modified by the ESD.

The RAOs remain valid. With the exception of the cleanup level for arsenic (discussed above) the established cleanup levels remain valid.

With the exception of MCLs and ARARs related to maintenance or monitoring, most ARARs will have been addressed appropriately during the construction of the remedy. This will be evaluated in the review of the Final Remedial Construction Report.

VIII(B) Issues - OU2

There are no current issues which would prevent the remedy at OU2 from being considered protective. Long-term institutional controls restricting inappropriate land uses and protecting the landfill cap and other components of the remedy need to be established. Discussions are underway between EPA, MADEP and the property owners to establish long-term institutional controls.

IX(B) Recommendations and Follow-up Actions - OU2

No recommendations or follow-up actions with regard to protectiveness have been identified for OU2.

X Protectiveness Statement

As described above, OU1 and OU2 are both essentially at the point of completion of implementation of the remedy. Review and approval of final summary documents (*Site Summary Report* for OU1, and *Final Remedial Construction Report* for OU2) is necessary in order for the implementation of the remedy to be considered complete at OU1 and OU2. While construction of the remedy at OU2 is essentially complete, groundwater cleanup levels have not yet been attained.

OU1

Review and approval of the Site Summary Report will confirm that the remedy for OU1 was implemented as required in the ROD and as modified by the ESD. The assumptions used at the time of remedy selection are valid and no changes to cleanup levels are warranted. The remedy at OU1 is expected to be protective of human health and the environment upon completion, and in the interim, exposure pathways that could result in unacceptable risks are being controlled.

OU2

Review and approval of the Final Remedial Construction Report will confirm that the remedy for OU2 was implemented as required in the ROD and as modified by the ESD. The assumptions used at the time of remedy selection are valid. The change of the MCL for arsenic would not change the selected remedy. In addition, the new MCL will be considered in the risk assessment used to determine whether interim cleanup levels (set at the time of the ROD) are protective or require modification. The remedy at OU2 is expected to be protective of human health and the environment upon completion, and in the interim, exposure pathways that could result in unacceptable risks are being controlled. Operation and Maintenance activities will be initiated upon the completion of construction, and will ensure that the landfill and associated components of the remedy remain in good condition. Institution controls, consisting of an Environmental Protection Easement and Declaration of Restrictive Covenants will be created and recorded to restrict inappropriate land uses and protect the landfill cap and other components of the remedy. In addition, monitoring of groundwater to assess progress towards attainment of cleanup level will be ongoing.

IX. Next Review

Five-year reviews are conducted every five years at sites where contaminant levels remain at concentrations that prevent unlimited, unrestricted use of the Site. The next five-year review for the Iron Horse Park Superfund Site should be conducted by 2008.

Attachments

Attachment 1

OU1 Documents Reviewed

- Environmental Resources Management. February, 1998. (ERM, 1998). *Soil Excavation and Asphalt Batching Report, Iron Horse Park Superfund Site, Operable Unit 1 - Lagoon Areas, Billerica, Massachusetts.*
- Environmental Resources Management. August, 2003. (ERM, 2003). *Black Stained Layer Evaluation (draft), Iron Horse Park Superfund Site, Operable Unit 1 - Lagoon Areas.*
- Environmental Resources Management. September, 2003. (ERM, 2003). *Site Summary Report (draft), Iron Horse Park Superfund Site, Operable Unit 1 - Lagoon Areas.*
- Metcalf & Eddy. September, 1998. (M&E, 1998). *First Five-Year Review Report. Iron Horse Park Superfund Site, Boston & Maine Lagoons (OU-1), North Billerica, Massachusetts.*
- United States Environmental Protection Agency. September 15, 1988. (EPA, 1988). *Record of Decision. Boston & Maine Wastewater Lagoons, Iron Horse Park, North Billerica, Massachusetts.*
- United States Environmental Protection Agency. 1990. (EPA, 1990). *Consent Decree. Iron Horse Park Wastewater Lagoons.*
- United States Environmental Protection Agency. October 1, 1997. (EPA, 1997). *Final Explanation of Significant Differences, Boston & Maine Wastewater Lagoons, Operable Unit 1, Iron Horse Park Superfund Site.*
- United States Environmental Protection Agency. June, 2001. (EPA, 2001). *Comprehensive Five-Year Review Guidance.*

Attachment 2

OU2 Documents Reviewed

- ENSR Consulting & Engineering. October, 1999. (ENSR, 1999). *Final (100%) Design Deliverable for Shaffer Landfill.*
- ENSR Consulting & Engineering. October, 1999. (ENSR, 1999). *Final Demonstration of Compliance Plan For Shaffer Landfill.*
- GeoSyntec Consultants. August, 2003. (GeoSyntec, 2003). *Final Remedial Construction Report. Iron Horse Park Superfund Site, Operable Unit Two, Shaffer Landfill, Billerica, Massachusetts*
- United States Environmental Protection Agency. June 27, 1991. (EPA, 1991). *Record of Decision, Shaffer Landfill Operable Unit, Iron Horse Park, Billerica, Massachusetts.*
- United States Environmental Protection Agency. September 8, 2000. (EPA, 2000). *Final Explanation of Significant Differences, Shaffer Landfill, Operable Unit 2, Iron Horse Park Superfund Site.*
- United States Environmental Protection Agency. 2001. (EPA, 2001). *Shaffer Landfill RD/RA Consent Decree.*
- United States Environmental Protection Agency. June, 2001. (EPA, 2001). *Comprehensive Five-Year Review Guidance.*

Attachment 3

Maps

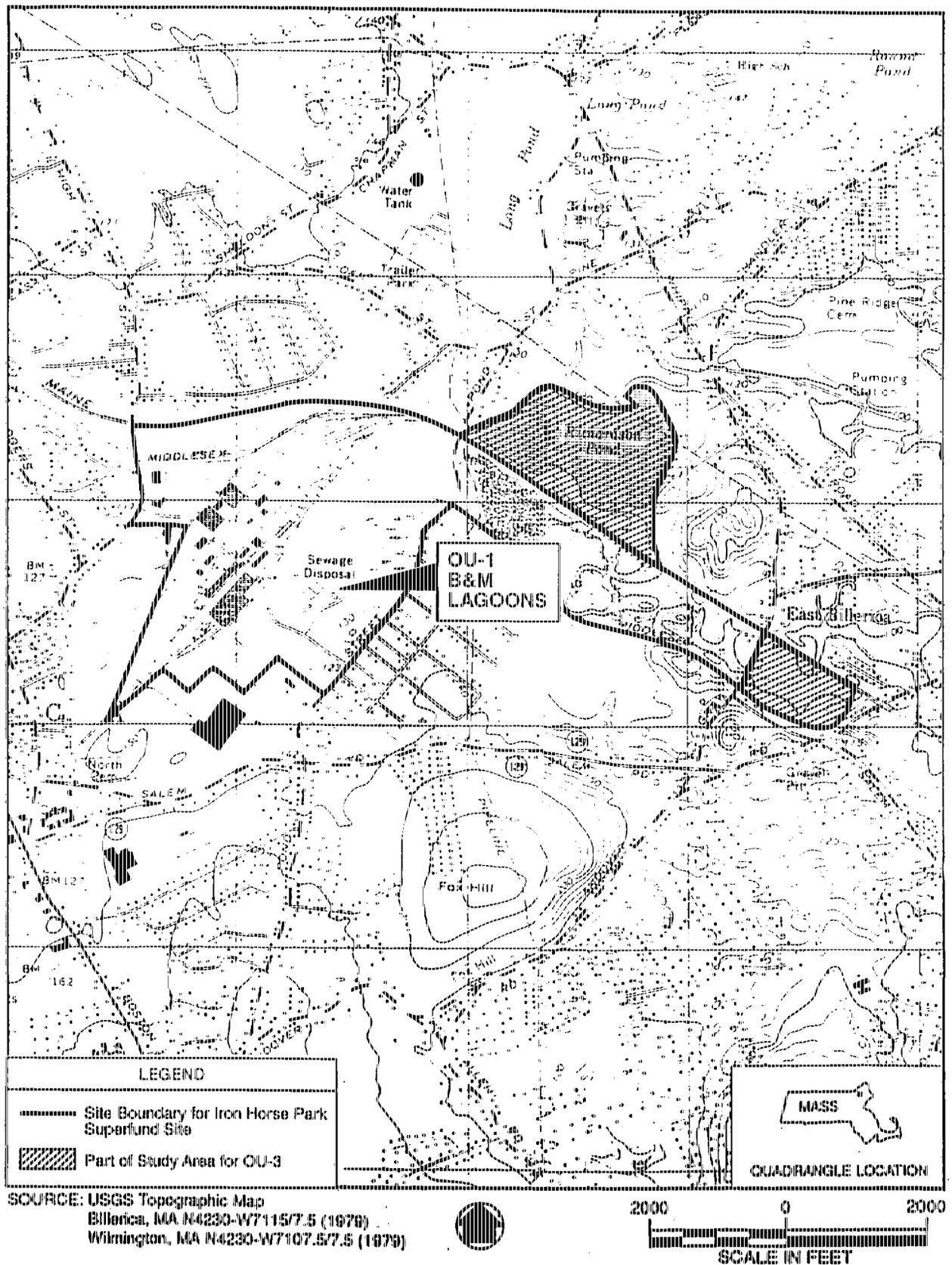
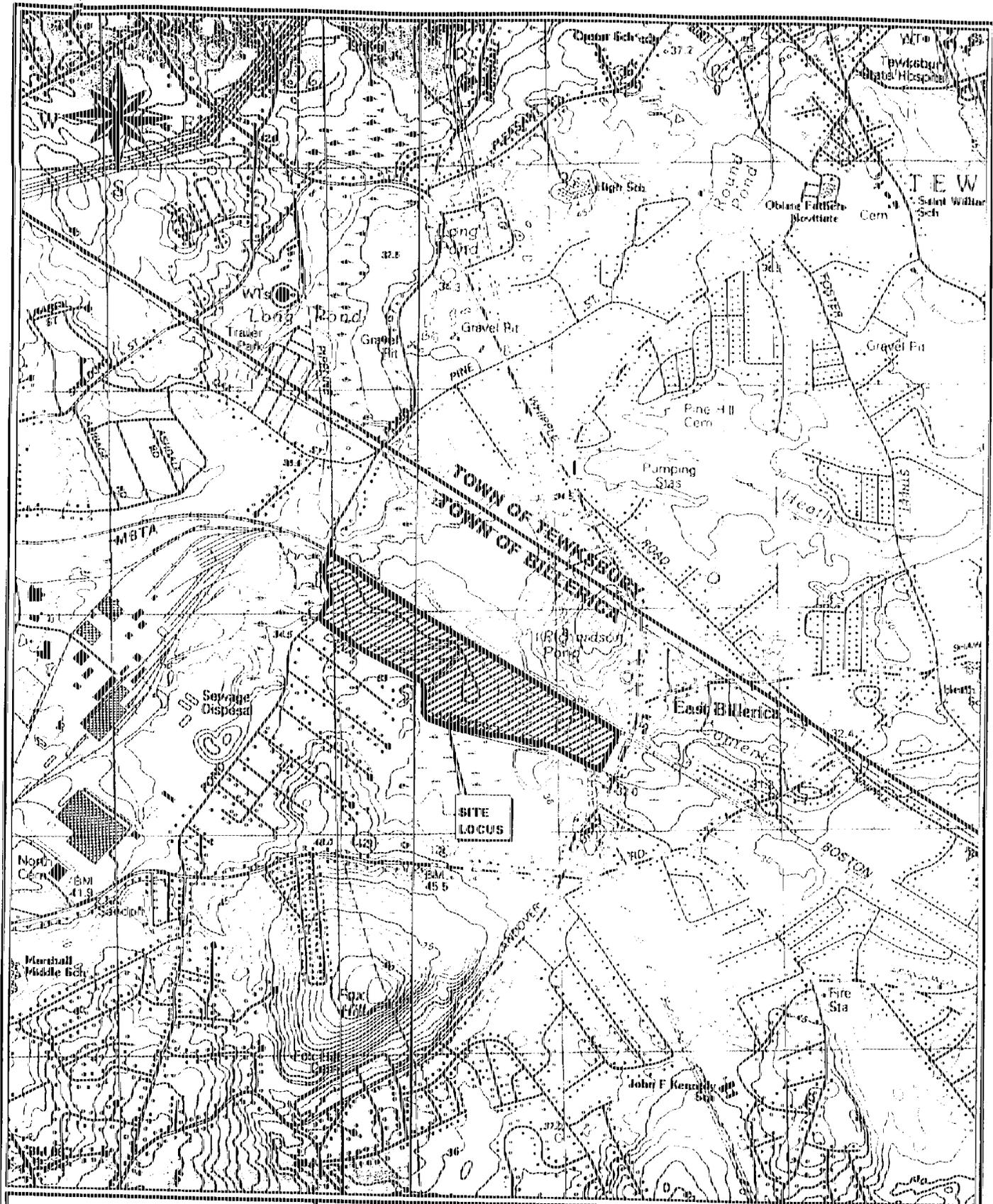
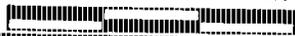


FIGURE 2. SITE LOCUS MAP



BROWN AND CALDWELL
 48 Leona Drive, Suite C
 Middleborough, Massachusetts, 02346
 Tel. (508) 923-0879 Fax. (508) 923-0894

FIGURE 1
SITE LOCUS MAP
SCHLAFER LANDFILL
BILLERICA, MASSACHUSETTS

1000 0 1000 2000 Feet

 PREPARED FOR:
 de maximus, inc.

DATE: 10/22/02
 PROJECT: 23178.001

SCALE: 1"=2000'
 FILE: Site Locus

NOTES:
 1. USGS Quad Maps obtained from MassGIS scanned USGS Quads 6-CD set, dated July 1998.