APPENDIX D: Glossary of Terms and Acronyms

LIST OF ACRONYMS AND ABBREVIATIONS

Acronym/ Abbreviation	Definition
ACO	Administrative Consent Order
AOC	Administrative Order on Consent
ARAR	Applicable or Relevant and Appropriate Requirement
ATSDR	Agency for Toxic Substances and Disease Registry
AWQC	Ambient Water Quality Criteria
BRA	Baseline Risk Assessment
BTEX	Benzene, toluene, ethylbenzene and xylene
CAA	Clean Air Act
CD	Consent Decree
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	CERCLA Information System Database
CFR	Code of Federal Regulations
COC	Contaminant of Concern
COPC	Contaminants of Potential Concern
CWA	Clean Water Act
EO	Executive Order
ERA	Environmental Risk Assessment
ESD	Explanation of Significant Difference
EPA	United States Environmental Protection Agency
EPC	Exposure Point Concentration
FS	Feasibility Study
HQ	Hazard Quotient
HRS	Hazard Ranking System
IEUBK	Integrated Exposure and Uptake Biokinetic model
LNAPL	Light Non-Aqueous Phase Liquid
LOAEL	Lowest Observed Adverse Effects Level
LTM	Long Term Monitoring
MADEP	Massachusetts Department of Environmental Protection
MCL	Maximum Contaminant Level
MCP	Massachusetts Contingency Plan
M&E	Metcalf & Eddy, Inc.
MNA	Monitored Natural Attenuation
NAPL	Non-Aqueous Phase Liquid
NCP	National Contingency Plan
ND	Not Detected

Acronym/ Abbreviation	Definition
NHESP	Natural Heritage and Endangered Species Act
NOAEL	No Observed Adverse Effects Level
NOED	No Observed Effects Dose
NPL	National Priorities List
O&M	Operation and Maintenance
OSHA	Occupational Safety and Health Administration
OSWER	EPA Office of Solid Waste and Emergency Response
OU	Operable Unit
PAH	Polycyclic aromatic hydrocarbon
PCB	Polychlorinated biphenyl
ppb	parts per billion
ppm	parts per million
PRG	Preliminary Remediation Goal
PRP	Potentially Responsible Party
RA	Remedial Action
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RfD	Reference Dose
RI	Remedial Investigation
RI/FS	Remedial Investigation/Feasibility Study
RME	Reasonable Maximum Exposure
ROD	Record of Decision
RPM	Remedial Project Manager
SDWA	Safe Drinking Water Act
SC	Source Control
SVOC	Semi-Volatile Organic Compound
TBCs	To Be Considered
TCE	Trichloroethene
TEL	Threshold Effects Level
TRV	Toxicity Reference Value
TSCA	Toxic Substances Control Act
UCL	Upper Confidence Limit
VOC	Volatile Organic Compound

APPENDIX E: Administrative Record Index and Guidance Documents

IRON HORSE PARK
NPL Site Administrative Record
Record of Decision (ROD)
Operable Unit 3

Index

Record of Decision Signed
September 2004

Administrative Record Released
February 2006

Prepared by
EPA New England
Office of Site Remediation & Restoration

Introduction to the Collection

This is the Administrative Record file for the Iron Horse Park Superfund site, North Billerica, MA, OU 3, Rest of Site, Record of Decision, released September 2004. The file contains site-specific documents and a list of guidance documents used by EPA staff in selecting a response action at the site.

This file includes by reference, the administrative record file for the Iron Horse Park, OU 1 Record of Decision, issued September 15, 1988 and the administrative record file for the Iron Horse Park, OU 2 Record of Decision, issued June 27, 1991.

Please Note: The best available copies were used to create this collection.

The Administrative Record has been corrected since its original September 2004 release. Several tables were inadvertently cut off in SDMS #214528, the Record of Decision, OU 3. In this revision, the document has been renumbered (#246581) and scanned with all tables complete.

The administrative record file is available for review at:

Billerica Public Library
15 Concord Road
Billerica, MA 01821
978-671-0948 (phone)
www.billericalibrary.org

EPA New England Superfund Records and Information Center
1 Congress Street, Suite 1100 (HSC)
Boston, MA 02114 (by appointment)
617-918-1440 (phone)
617-918-1223 (fax)
www.epa.gov/region01/superfund/resource/records.htm

Question about this administrative record file should be directed to the EPA New England site manager.

An administrative record file is required by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act (SARA).

03: REMEDIAL INVESTIGATION (RI)

209745 **EPA'S COMMENTS ON DRAFT HEALTH ASSESSMENT FOR IRON HORSE PARK**

Author: JOHN GALLAGHER US EPA REGION 1
Addressee: MARILYN DISIRIO US AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY (ATSDR)
Doc Type: LETTER
Doc Date: 01/20/1989 **# of Pages:** 3
File Break: 03.09

209746 **REVIEW OF HEALTH ASSESSMENT FOR IRON HORSE PARK AS AMENDED APRIL 4, 1990**

Author: DON MCELROY US EPA
Addressee: LOUISE A HOUSE US PUBLIC HEALTH SERVICE/ATSDR
Doc Type: MEMO
Doc Date: 08/20/1990 **# of Pages:** 5
File Break: 03.09

209731 **REVIEW OF PROPOSAL FOR TRENCH EXCAVATION AT BNZ MATERIALS INC.**

Author: DALE YOUNG MA DEPT OF ENVIRONMENTAL PROTECTION
Addressee: ROGER P THIBAULT GZA GEOENVIRONMENTAL INC
Doc Type: LETTER
Doc Date: 11/06/1990 **# of Pages:** 2
File Break: 03.01

209733 **SCOPING MEETING SUMMARY, IRON HORSE REMEDIAL INVESTIGATION/FEASIBILITY STUDY (RI/FS)**

Author: DEBORAH M SIMONE METCALF & EDDY
Addressee: DON MCELROY US EPA
Doc Type: LETTER
Doc Date: 10/29/1992 **# of Pages:** 7
File Break: 03.03

03: REMEDIAL INVESTIGATION (RI)

209734 **IRON HORSE PARK, OU3 REMEDIAL INVESTIGATION (RI) - SCOPE**

Author: DON MCELROY US EPA
Addressee: NANCY BARMAKIAN US EPA REGION 1
Doc Type: MEMO
Doc Date: 11/16/1992 **# of Pages:** 2
File Break: 03.03

209739 **COMMENTS ON "DRAFT WORK PLAN FOR REMEDIAL INVESTIGATION (RI)"**

Author: HELEN WALDORF MA DEPT OF ENVIRONMENTAL PROTECTION
Addressee: DON MCELROY US EPA
Doc Type: LETTER
Doc Date: 01/05/1993 **# of Pages:** 5
File Break: 03.07

209740 **COMMENTS ON IRON HORSE DRAFT WORKPLAN FOR OU3**

Author: MARGARET MCDONOUGH US EPA REGION 1
Addressee: DON MCELROY US EPA
Doc Type: MEMO
Doc Date: 01/07/1993 **# of Pages:** 5
File Break: 03.07

209741 **COMMENTS ON DRAFT WORK PLAN FOR REMEDIAL INVESTIGATION (RI)**

Author: PATTI LYNNE TYLER US EPA REGION 1
Addressee: DON MCELROY US EPA
Doc Type: MEMO
Doc Date: 01/10/1993 **# of Pages:** 6
File Break: 03.07

03: REMEDIAL INVESTIGATION (RI)

209735 **SCOPE OF WORK SUMMARY FOR THE FIELD ACTIVITIES FOR THE REMEDIAL INVESTIGATION (RI)**

Author: METCALF & EDDY
Addressee:
Doc Type: REPORT
Doc Date: 02/01/1993 **# of Pages:** 24
File Break: 03.03

209742 **FINAL WORK PLAN FOR REMEDIAL INVESTIGATION (RI)**

Author: METCALF & EDDY
Addressee:
Doc Type: REPORT
Doc Type: WORK PLAN
Doc Date: 06/01/1993 **# of Pages:** 131
File Break: 03.07

65002 **HYDROGEOLOGICAL ASSESSMENT REPORT**

Author: METCALF & EDDY
Addressee: US EPA REGION 1
Doc Type: REPORT
Doc Date: 02/01/1994 **# of Pages:** 226
File Break: 03.06

209747 **REVIEW OF THE "BENTHIC INVERTEBRATE RECONNAISSANCE SURVEY, IRON HORSE PARK, BILLERICA, MA"**

Author: PATTI LYNNE TYLER US EPA REGION 1
Addressee: DON MCELROY US EPA
Doc Type: MEMO
Doc Date: 04/01/1994 **# of Pages:** 2
File Break: 03.10

03: REMEDIAL INVESTIGATION (RI)

209743 FINAL WORK PLAN AMENDMENT FOR REMEDIAL INVESTIGATION (RI)

Author: METCALF & EDDY
Addressee:
Doc Date: 09/01/1994 **# of Pages:** 106
File Break: 03.07
Doc Type: REPORT
Doc Type: WORK PLAN

209744 COMMENTS ON "DRAFT WORK PLAN AMENDMENT FOR REMEDIAL INVESTIGATION (RI)"

Author: DON MCELROY US EPA
Addressee: DEBORAH M SIMONE METCALF & EDDY
Doc Date: 09/16/1994 **# of Pages:** 6
File Break: 03.07
Doc Type: LETTER

209736 COMMENTS ON REMEDIAL INVESTIGATION (RI) DRAFT REPORT

Author: PATTI LYNNE TYLER US EPA REGION 1
Addressee: DON MCELROY US EPA
Doc Date: 10/08/1996 **# of Pages:** 10
File Break: 03.06
Doc Type: MEMO

209732 REVIEW OF "REMEDIAL INVESTIGATION (RI) DRAFT REPORT" FOR THE THIRD OPERABLE UNIT

Author: JAY NAPARSTEK MA DEPT OF ENVIRONMENTAL PROTECTION
Addressee: DON MCELROY US EPA
Doc Date: 12/10/1996 **# of Pages:** 4
File Break: 03.01
Doc Type: LETTER

03: REMEDIAL INVESTIGATION (RI)

209737 **COMMENTS ON REMEDIAL INVESTIGATION (RI) DRAFT REPORT**

Author: MARGARET MCDONOUGH US EPA REGION 1
Addressee: DON MCELROY US EPA
Doc Type: MEMO
Doc Date: 02/28/1997 **# of Pages:** 2
File Break: 03.06

209738 **DRAFT REMEDIAL INVESTIGATION (RI) COMMENTS**

Author: DON MCELROY US EPA
Addressee: DEBORAH M SIMONE METCALF & EDDY
Doc Type: LETTER
Doc Date: 07/14/1997 **# of Pages:** 53
File Break: 03.06

209748 **SURFACE SOIL HOT SPOTS AT IRON HORSE PARK, MEMO TO FILE**

Author: JOHN YOUNG METCALF & EDDY
Addressee:
Doc Type: MEMO
Doc Date: 08/15/1997 **# of Pages:** 5
File Break: 03.10

204924 **REMEDIAL INVESTIGATION (RI) FINAL REPORT, VOLUME 1 OF 5, TEXT**

Author: METCALF & EDDY
Addressee: US EPA REGION 1
Doc Type: REPORT
Doc Date: 09/01/1997 **# of Pages:** 489
File Break: 03.06

03: REMEDIAL INVESTIGATION (RI)

204925 REMEDIAL INVESTIGATION (RI) FINAL REPORT, VOLUME 2 OF 5, TABLES

Author: METCALF & EDDY
Addressee: US EPA REGION 1
Doc Type: REPORT
Doc Date: 09/01/1997
# of Pages: 410
File Break: 03.06

204926 REMEDIAL INVESTIGATION (RI) FINAL REPORT, VOLUME 3 OF 5, FIGURES

Author: METCALF & EDDY
Addressee: US EPA REGION 1
Doc Type: REPORT
Doc Date: 09/01/1997
# of Pages: 95
File Break: 03.06

204927 REMEDIAL INVESTIGATION (RI) FINAL REPORT, VOLUME 4 OF 5, APPENDICES A-E

Author: METCALF & EDDY
Addressee: US EPA REGION 1
Doc Type: REPORT
Doc Date: 09/01/1997
# of Pages: 702
File Break: 03.06

204928 REMEDIAL INVESTIGATION (RI) FINAL REPORT, VOLUME 5 OF 5, APPENDICES F-I

Author: METCALF & EDDY
Addressee: US EPA REGION 1
Doc Type: REPORT
Doc Date: 09/01/1997
# of Pages: 1798
File Break: 03.06

03: REMEDIAL INVESTIGATION (RI)

65003 **COMMENTS ON THE BASELINE HUMAN HEALTH RISK ADDENDUM, OLD B & M OIL/SLUDGE RECYCLING AREA**

Author: MARGARET MCDONOUGH US EPA REGION 1
Addressee: DON MCELROY US EPA
Doc Type: MEMO
Doc Date: 12/04/2001 **# of Pages:** 2
File Break: 03.10

04: FEASIBILITY STUDY (FS)

212916 **COMMENTS ON THE PROPOSED PLAN FOR IRON HORSE PARK ASBESTOS LAGOONS**

Author: BRUCE D RAY JOHNS-MANSVILLE
Addressee: DON MCELROY US EPA
Doc Type: LETTER
Doc Date: 01/01/0001 **# of Pages:** 1
File Break: 04.09

64996 **TRANSMITTAL OF DRAFT FEASIBILITY STUDY WORK PLAN**

Author: DON MCELROY US EPA
Addressee: JANET WALDRON MA DEPT OF ENVIRONMENTAL QUALITY ENGINEERING
Doc Type: LETTER
Doc Date: 05/19/1998 **# of Pages:** 1
File Break: 04.01

04: FEASIBILITY STUDY (FS)

65004 **MADEP COMMENTS ON THE FEASIBILITY STUDY DRAFT REPORT**

Author: JAY NAPARSTEK MA DEPT OF ENVIRONMENTAL PROTECTION
Addressee: DON MCELROY US EPA
Doc Type: LETTER
Doc Date: 05/08/2000 **# of Pages:** 11
File Break: 04.01

65005 **COMMENTS ON THE DRAFT FEASIBILITY STUDY**

Author: MARGARET MCDONOUGH US EPA REGION 1
Addressee: DON MCELROY US EPA
Doc Type: MEMO
Doc Date: 08/01/2000 **# of Pages:** 2
File Break: 04.01

65006 **REVIEW OF THE DRAFT FEASIBILITY STUDY REPORT**

Author: PATTI LYNNE TYLER US EPA REGION 1
Addressee: DON MCELROY US EPA
Doc Type: MEMO
Doc Date: 08/16/2000 **# of Pages:** 6
File Break: 04.01

64998 **REVIEW OF IRON HORSE PARK SAMPLING DATA**

Author: DARRYL LUCE US EPA REGION 1
Addressee: DON MCELROY US EPA
Doc Type: MEMO
Doc Date: 03/21/2001 **# of Pages:** 2
File Break: 04.01

04: FEASIBILITY STUDY (FS)

64999 CONFERENCE CALL ON ISSUES WITH RESPECT TO A POTENTIAL GROUND WATER REMEDY

Author: DARRYL LUCE US EPA REGION 1
Addressee: DON MCELROY US EPA
Doc Date: 05/08/2001 # of Pages: 1
Doc Type: MEMO
File Break: 04.01

65000 REVIEW OF GROUND WATER MODEL AND INFORMATION RELEVANT TO A GROUND WATER REMEDY

Author: DARRYL LUCE US EPA REGION 1
Addressee: DON MCELROY US EPA
Doc Date: 06/06/2001 # of Pages: 1
Doc Type: MEMO
File Break: 04.01

65007 RESPONSE TO REVIEW COMMENTS ON THE DRAFT FEASIBILITY STUDY REPORT

Author: METCALF & EDDY
Addressee:
Doc Date: 09/06/2001 # of Pages: 28
Doc Type: LIST
File Break: 04.01

65008 MADEP COMMENTS ON METCALF & EDDY RESPONSE TO REVIEW COMMENTS ON THE DRAFT FEASIBILITY STUDY REPORT

Author: JANET WALDRON MA DEPT OF ENVIRONMENTAL QUALITY ENGINEERING
Addressee: DON MCELROY US EPA
Doc Date: 10/31/2001 # of Pages: 3
Doc Type: LETTER
File Break: 04.01

04: FEASIBILITY STUDY (FS)

65009 **MADEP COMMENTS ON SUPPLEMENTAL ANALYSIS OF ECOLOGICAL RISK IN EAST & WEST MIDDLESEX CANAL**

Author: NANCY BETTINGER MA DEPT OF ENVIRONMENTAL PROTECTION
Addressee: JANET WALDRON MA DEPT OF ENVIRONMENTAL QUALITY ENGINEERING
Doc Type: MEMO
Doc Date: 12/03/2001 **# of Pages:** 8
File Break: 04.01

65010 **MADEP REVIEW OF "COMPARATIVE ANALYSIS OF THE REMEDIAL TECHNOLOGIES BY AOC"**

Author: JANET WALDRON MA DEPT OF ENVIRONMENTAL QUALITY ENGINEERING
Addressee: DON MCELROY US EPA
Doc Type: LETTER
Doc Date: 03/11/2002 **# of Pages:** 4
File Break: 04.01

65011 **MEETING MINUTES ON COMMENTS TO SECTION 7 OF THE DRAFT FEASIBILITY STUDY REPORT**

Author: LAURIE OSOWSKI METCALF & EDDY
Addressee: SEAN CZARNIECKI METCALF & EDDY
DON MCELROY US EPA
D ROBERTS ROBERTS ENVIRONMENTAL
D SILVERMAN METCALF & EDDY
DEBORAH M SIMONE METCALF & EDDY
JANET WALDRON MA DEPT OF ENVIRONMENTAL QUALITY ENGINEERING
Doc Type: MEMO
Doc Date: 10/29/2002 **# of Pages:** 4
File Break: 04.01

04: FEASIBILITY STUDY (FS)

65012 RESPONSE TO REVIEW COMMENTS ON THE DRAFT FEASIBILITY STUDY REPORT

Author: JANET WALDRON MA DEPT OF ENVIRONMENTAL QUALITY ENGINEERING
Addressee: DON MCELROY US EPA
Doc Type: LETTER
Doc Date: 11/07/2002 **# of Pages:** 2
File Break: 04.01

65013 ATTACHMENT TO MA DEP MEMO ON OU #3 ISSUES

Author: MA DEPT OF ENVIRONMENTAL PROTECTION
Addressee:
Doc Type: MEMO
Doc Date: 12/10/2002 **# of Pages:** 4
File Break: 04.01

204929 FEASIBILITY STUDY (FS) FINAL REPORT, VOLUME 1 OF 3, TEXT

Author: METCALF & EDDY
Addressee: US EPA REGION 1
Doc Type: REPORT
Doc Date: 03/01/2003 **# of Pages:** 769
File Break: 04.06

204930 FEASIBILITY STUDY (FS) FINAL REPORT, VOLUME 2 OF 3, TABLES AND FIGURES

Author: METCALF & EDDY
Addressee: US EPA REGION 1
Doc Type: REPORT
Doc Date: 03/01/2003 **# of Pages:** 499
File Break: 04.06

04: FEASIBILITY STUDY (FS)

204931 **FEASIBILITY STUDY (FS) FINAL REPORT, VOLUME 3 OF 3, APPENDICES**

Author: METCALF & EDDY
Addressee: US EPA REGION 1
Doc Type: REPORT
Doc Date: 03/01/2003 **# of Pages:** 1087
File Break: 04.06

64995 **OU #3 ISSUES**

Author: MA DEPT/BUREAU OF WASTE SITE CLEANUP WESTERN REG OFFICE
Addressee:
Doc Type: MISC
Doc Date: 04/01/2003 **# of Pages:** 5
File Break: 04.01

64997 **MADEP COMMENTS ON THE FINAL FEASIBILITY STUDY**

Author: JANET WALDRON MA DEPT OF ENVIRONMENTAL QUALITY ENGINEERING
Addressee: DON MCELROY US EPA
Doc Type: LETTER
Doc Date: 04/04/2003 **# of Pages:** 2
File Break: 04.01

04: FEASIBILITY STUDY (FS)

65016 **REVIEW OF ECO PRGS**

Author: RICHARD SUGATT US EPA REGION 1
Addressee: CHESTER L JANOWSKI US EPA REGION 1
DON MCELROY US EPA
Doc Type: MEMO
Doc Date: 04/25/2003 **# of Pages:** 1
File Break: 04.01

65017 **CLEANUP GOALS AT IRON HORSE PARK**

Author: MARGARET MCDONOUGH US EPA REGION 1
Addressee: DON MCELROY US EPA
Doc Type: MEMO
Doc Date: 04/25/2003 **# of Pages:** 1
File Break: 04.01

65019 **REVIEW OF THE FEASIBILITY STUDY FINAL REPORT**

Author: JANET WALDRON MA DEPT OF ENVIRONMENTAL QUALITY ENGINEERING
Addressee: DON MCELROY US EPA
Doc Type: LETTER
Doc Date: 03/04/2004 **# of Pages:** 2
File Break: 04.01

04: FEASIBILITY STUDY (FS)

65015 **REVIEW OF THE DRAFT PROPOSED PLAN**

Author: JANET WALDRON MA DEPT OF ENVIRONMENTAL QUALITY ENGINEERING
Addressee: DON MCELROY US EPA
Doc Type: LETTER
Doc Date: 04/22/2004 **# of Pages:** 3
File Break: 04.09

209725 **PROPOSED PLAN, IRON HORSE PARK SUPERFUND SITE**

Author: US EPA REGION 1
Addressee:
Doc Type: FACT SHEET
Doc Date: 06/01/2004 **# of Pages:** 25
File Break: 04.09

212920 **TRANSCRIPT OF THE PUBLIC HEARING ON THE PROPOSED PLAN FOR OPERABLE UNIT 3 AT THE IRON HORSE PARK SUPERFUND SITE**

Author: US EPA REGION 1
Addressee:
Doc Type: PUBLIC MEETING RECORD
Doc Date: 06/16/2004 **# of Pages:** 13
File Break: 04.09

212918 **QUESTIONS REGARDING THE IRON HORSE PARK PROPOSAL**

Author: JEANNE L GALLO BILLERICA (MA) RESIDENT
Addressee: DON MCELROY US EPA
Doc Type: LETTER
Doc Date: 06/17/2004 **# of Pages:** 1
File Break: 04.09

04: FEASIBILITY STUDY (FS)

212919 **REQUEST FOR A 30 DAY EXTENSION OF THE COMMENT PERIOD ON THE PROPOSED PLAN FOR IRON HORSE PARK SUPERFUND SITE**

Author: PETER E NANGERONI ESS GROUP INC
Addressee: DON MCELROY US EPA
Doc Type: LETTER
Doc Date: 07/07/2004 **# of Pages:** 1
File Break: 04.09

212915 **COMMENTS ON THE PROPOSED PLAN FOR IRON HORSE PARK OPERABLE UNIT 3**

Author: JANET S WALDRON MA DEPT OF ENVIRONMENTAL PROTECTION
Addressee: DON MCELROY US EPA
Doc Type: LETTER
Doc Date: 07/16/2004 **# of Pages:** 3
File Break: 04.09

212914 **COMMENTS ON IRON HORSE PARK CLEANUP PLAN**

Author: ROBERT J STANTON BILLERICA (MA) RESIDENT
Addressee: DON MCELROY US EPA
Doc Type: MEMO
Doc Date: 08/05/2004 **# of Pages:** 1
File Break: 04.09

04: FEASIBILITY STUDY (FS)

212912 **FORMAL COMMENTS ON THE PROPOSED PLAN - OPERABLE UNIT 3, IRON HORSE PARK SUPERFUND SITE**

Author: MICHAEL S GITTEN ESS GROUP INC
Addressee: PETER E NANGERONI ESS GROUP INC
DON MCELROY US EPA
Doc Type: LETTER

Doc Date: 08/13/2004 **# of Pages:** 4
File Break: 04.09

212913 **COMMENTS ON EPA'S PROPOSED PLAN FOR LAGOONS AT OPERABLE UNIT 3, IRON HORSE PARK SUPERFUND SITE**

Author: ROBERT F FITZPATRICK WILMER CUTLER PICKERING HALE & DORR
Addressee: DON MCELROY US EPA
Doc Type: LETTER

Doc Date: 08/13/2004 **# of Pages:** 6
File Break: 04.09

214527 **LABORATORY REPORT, THREE LAGOONS**

Author: DANIEL S GRANZ US EPA REGION 1
Addressee: DON MCELROY US EPA
Doc Type: LETTER
Doc Type: SAMPLING & ANALYSIS DATA

Doc Date: 09/23/2004 **# of Pages:** 10
File Break: 04.02

05: RECORD OF DECISION (ROD)

214526 **ROD CONCURRENCE LETTER**

Author: RICHARD J CHALPIN MA DEPT OF ENVIRONMENTAL PROTECTION
Addressee: SUSAN STUDLIEN US EPA REGION 1 - OFFICE OF SITE REMEDIATION & RESTORATION
Doc Type: LETTER
Doc Date: 09/24/2004 **# of Pages:** 1
File Break: 05.01

246581 **RECORD OF DECISION FOR OPERABLE UNIT 3, CORRECTED VERSION**

Author: US EPA REGION 1
Addressee:
Doc Type: RECORD OF DECISION
Doc Date: 09/30/2004 **# of Pages:** 0
File Break: 05.04

09: STATE COORDINATION

209749 **PRELIMINARY ASSESSMENT MAP: 1, 1/2, & 1/4 MILE RADII**

Author: MA DEPT OF ENVIRONMENTAL PROTECTION
Addressee:
Doc Type: MAP
Doc Date: 04/23/1998 **# of Pages:** 1
File Break: 09.10

09: STATE COORDINATION

209750 **GROUNDWATER USE AND VALUE DETERMINATION, IRON HORSE PARK**

Author: MA DEPT OF ENVIRONMENTAL PROTECTION
Addressee:
Doc Type: MEMO
Doc Date: 06/01/1998
File Break: 09.10
# of Pages: 3

65021 **MADEP ITEMS THAT NEED TO BE ADDRESSES FOR OU 3**

Author: MA DEPT OF ENVIRONMENTAL PROTECTION
Addressee:
Doc Type: LIST
Doc Date: 09/04/2002
File Break: 09.01
# of Pages: 6

16: NATURAL RESOURCE TRUSTEE

209751 **REVIEW OF THE IRON HORSE PARK 3RD OPERABLE UNIT SCOPE OF SERVICES FOR SURFACE WATER AND SEDIMENT SAMPLING**

Author: STEVEN E MIERZYKOWSKI US DOI/US FISH & WILDLIFE SERVICE
Addressee: DON MCELROY US EPA
Doc Type: LETTER
Doc Date: 06/03/1992
File Break: 16.01
# of Pages: 3

16: NATURAL RESOURCE TRUSTEE

209752 **REVIEW OF THE DRAFT REMEDIAL INVESTIGATION (RI) WORKPLAN FOR IRON HORSE PARK, OPERABLE UNIT 3**

Author: KENNETH FINKLESTEIN US NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
Addressee: DON MCELROY US EPA
Doc Type: LETTER
Doc Date: 02/24/1993 **# of Pages:** 1
File Break: 16.01

17: SITE MANAGEMENT RECORDS

209724 **SITE ANALYSIS AND WETLANDS ASSESSMENT: IRON HORSE PARK, BILLERICA, MASSACHUSETTS, VOLUME 2, EPIC BOOK**

Author: US EPA - ENVIRONMENTAL PHOTOGRAPHIC INTERPRETATION CTR (EPIC)
Addressee: US EPA REGION 1
Doc Type: PHOTOGRAPH
Doc Type: REPORT
Doc Date: 03/01/1987 **# of Pages:** 1
File Break: 17.04

Number of Documents in Collection66

GUIDANCE DOCUMENTS

EPA guidance documents may be reviewed at the EPA Region I Superfund Records Center in Boston, Massachusetts.

TITLE
INTERIM FINAL GUIDANCE FOR CONDUCTING REMEDIAL INVESTIGATIONS AND FEASIBILITY STUDIES UNDER CERCLA.

DOCDATE	OSWER/EPA ID	DOCNUMBER
10/1/1988	OSWER #9355.3-01	2002

TITLE
GEOPHYSICAL TECHNIQUES FOR SENSING BURIED WASTES AND WASTE MIGRATION

DOCDATE	OSWER/EPA ID	DOCNUMBER
6/1/1984	EPA-600/7-84/064	2111

TITLE
TEST METHODS FOR EVALUATING SOLID WASTE, LABORATORY MANUAL PHYSICAL/CHEMICAL METHODS, THIRD EDITION (VOLUMES IA, IB, IC, AND II)

DOCDATE	OSWER/EPA ID	DOCNUMBER
11/1/1986		2118

TITLE
CHEMICAL, PHYSICAL & BIOLOGICAL PROPERTIES OF COMPOUNDS PRESENT AT HAZARDOUS WASTE SITES

DOCDATE	OSWER/EPA ID	DOCNUMBER
9/27/1985	OSWER #9850.3	5001

TITLE
GUIDELINES FOR CARCINOGEN RISK ASSESSMENT (FEDERAL REGISTER, SEPTEMBER 24, 1986, p. 33992

DOCDATE	OSWER/EPA ID	DOCNUMBER
9/24/1986		5003

TITLE
GUIDELINES FOR EXPOSURE ASSESSMENT (FEDERAL REGISTER, SEPTEMBER 24, 1986, p. 34042)

DOCDATE	OSWER/EPA ID	DOCNUMBER
9/24/1986		5004

TITLE
GUIDELINES FOR THE HEALTH RISK ASSESSMENT OF CHEMICAL MIXTURES (FEDERAL REGISTER, SEPTEMBER 24, 1986, p. 34014)

DOCDATE	OSWER/EPA ID	DOCNUMBER
9/24/1986		5007

TITLE
HEALTH EFFECTS ASSESSMENT DOCUMENTS (58 CHEMICAL PROFILES)

DOCDATE	OSWER/EPA ID	DOCNUMBER
9/1/1984	EPA/540/1-86/001-058	5008

TITLE
EXPOSURE FACTORS HANDBOOK

DOCDATE	OSWER/EPA ID	DOCNUMBER
7/1/1989	EPA/600/8-89/043	5020

TITLE
RISK ASSESSMENT GUIDANCE FOR SUPERFUND, VOLUME I, HUMAN HEALTH EVALUATION MANUAL

DOCDATE	OSWER/EPA ID	DOCNUMBER
9/29/1989	OSWER #9285.7-01a	5023

TITLE
RISK ASSESSMENT GUIDANCE FOR SUPERFUND, VOLUME II, ENVIRONMENTAL EVALUATION MANUAL

DOCDATE	OSWER/EPA ID	DOCNUMBER
3/1/1989	EPA/540/1-89/001	5024

TITLE
TOXICOLOGICAL PROFILE FOR ARSENIC

DOCDATE	OSWER/EPA ID	DOCNUMBER
3/1/1989		5028

TITLE
TOXICOLOGICAL PROFILE FOR BENZENE

DOCDATE	OSWER/EPA ID	DOCNUMBER
5/1/1989		5029

TITLE
TOXICOLOGICAL PROFILE FOR BERYLLIUM

DOCDATE	OSWER/EPA ID	DOCNUMBER
12/1/1988		5030

TITLE
TOXICOLOGICAL PROFILE FOR CADMIUM

DOCDATE	OSWER/EPA ID	DOCNUMBER
3/1/1989		5031

TITLE
TOXICOLOGICAL PROFILE FOR CHROMIUM

DOCDATE	OSWER/EPA ID	DOCNUMBER
7/1/1989		5033

TITLE
TOXICOLOGICAL PROFILE FOR DI(2-ETHYLHEXYL)PHTHALATE

DOCDATE	OSWER/EPA ID	DOCNUMBER
4/1/1989		5034

TITLE
TOXICOLOGICAL PROFILE FOR HEPTACHLOR/HEPTACHLOR EPOXIDE

DOCDATE	OSWER/EPA ID	DOCNUMBER
4/1/1989		5035

TITLE
TOXICOLOGICAL PROFILE FOR METHYLENE CHLORIDE

DOCDATE	OSWER/EPA ID	DOCNUMBER
4/1/1989		5036

TITLE
TOXICOLOGICAL PROFILE FOR N-NITRO SODIPHENYLAMINE

DOCDATE	OSWER/EPA ID	DOCNUMBER
12/1/1988		5037

TITLE
TOXICOLOGICAL PROFILE FOR NICKEL

DOCDATE	OSWER/EPA ID	DOCNUMBER
12/1/1988		5038

TITLE
TOXICOLOGICAL PROFILE FOR SELECTED PCBs (AROCLOR-1260, -1254, -1248, -1242, -1232, -1221, AND -1016

DOCDATE	OSWER/EPA ID	DOCNUMBER
6/1/1989		5039

TITLE
TOXICOLOGICAL PROFILE FOR TRICHLOROETHYLENE

DOCDATE	OSWER/EPA ID	DOCNUMBER
10/1/1989		5040

TITLE
TOXICOLOGICAL PROFILE FOR VINYL CHLORIDE

DOCDATE	OSWER/EPA ID	DOCNUMBER

8/1/1989 5041

TITLE
DEVELOPMENT OF STATISTICAL DISTRIBUTION OR RANGES STANDARD FACTORS USED IN EXPOSURE ASSESSMENTS.

DOCDATE	OSWER/EPA ID	DOCNUMBER
3/1/1985	EPA OHEA-E-16	C020

TITLE
NATIONAL OIL AND HAZARDOUS SUBSTANCES POLLUTION CONTINGENCY PLAN.

DOCDATE	OSWER/EPA ID	DOCNUMBER
		C063

TITLE
SUPPLEMENTAL RISK ASSESSMENT GUIDANCE FOR THE SUPERFUND PROGRAM. DRAFT FINAL

DOCDATE	OSWER/EPA ID	DOCNUMBER
6/1/1989	EPA 901/5-89-001	C104

TITLE
GUIDANCE FOR EVALUATING THE TECHNICAL IMPRACTICABILITY OF GROUND WATER RESTORATION.

DOCDATE	OSWER/EPA ID	DOCNUMBER
10/4/1993	OSWER 9234.2-25	C158

TITLE
ESTIMATING POTENTIAL FOR OCCURRENCE OF DNAPL AT SUPERFUND SITES.

DOCDATE	OSWER/EPA ID	DOCNUMBER
1/1/1992	9355.4-07FS	C218

TITLE
DERMAL EXPOSURE ASSESSMENT: PRINCIPLES AND APPLICATIONS. INTERIM REPORT.

DOCDATE	OSWER/EPA ID	DOCNUMBER
1/1/1992	EPA/600/8-91/011B	C227

TITLE
CLASSIFICATION OF WETLANDS AND DEEPWATER HABITATS OF THE UNITED STATES.

DOCDATE	OSWER/EPA ID	DOCNUMBER
12/1/1979	FWS/OBS-79/31	C233

TITLE
ECOLOGICAL ASSESSMENT OF HAZARDOUS WASTE SITES: A FIELD AND LABORATORY REFERENCE.

DOCDATE	OSWER/EPA ID	DOCNUMBER
3/1/1989	EPA/600/3-89/013	C251

TITLE
ROLE OF THE BASELINE RISK ASSESSMENT IN SUPERFUND REMEDY SELECTION DECISIONS

DOCDATE	OSWER/EPA ID	DOCNUMBER
4/22/1991	OSWER #9355.0-30	C276

TITLE
RISK-BASED CONCENTRATION TABLE, THIRD QUARTER 1994

DOCDATE	OSWER/EPA ID	DOCNUMBER
7/11/1994		C277

TITLE
RISK UPDATE ISSUE NO. 2

DOCDATE	OSWER/EPA ID	DOCNUMBER
8/1/1994		C288

TITLE
ECOLOGICAL RISK ASSESSMENT GUIDANCE FOR SUPERFUND PROCESS FOR DESIGNING AND CONDUCTING ECOLOGICAL RISK ASSESSMENTS (EPA 540-R-97-006)

DOCDATE	OSWER/EPA ID	DOCNUMBER
6/2/1997		C361

TITLE
FRAMEWORK FOR ECOLOGICAL RISK ASSESSMENT (EPA/630/R-92/001)

DOCDATE	OSWER/EPA ID	DOCNUMBER
2/1/1992		C364

TITLE
TOXICOLOGICAL BENCHMARKS FOR WILDLIFE: 1996 REVISION

DOCDATE	OSWER/EPA ID	DOCNUMBER
6/1/1996		C368

TITLE
ECOLOGICAL RISK ASSESSMENT ISSUE PAPERS (EPA/630/R-94/009)

DOCDATE	OSWER/EPA ID	DOCNUMBER
11/1/1994		C369

TITLE
TOXICOLOGICAL BENCHMARKS FOR SCREENING POTENTIAL CONTAMINANTS OF CONCERN FOR EFFECTS ON AQUATIC BIOTA: 1994 REVISION

DOCDATE	OSWER/EPA ID	DOCNUMBER
7/1/1994		C376

TITLE
GUIDELINES FOR THE PROTECTION AND MANAGEMENT OF AQUATIC SEDIMENT QUALITY IN ONTARIO

DOCDATE	OSWER/EPA ID	DOCNUMBER
1/1/1996		C390

TITLE
GREAT LAKES WATER QUALITY INITIATIVE CRITERIA DOCUMENTS FOR THE PROOTECTION OF WILDLIFE (PROPOSED) DDT MERCURY 2,3,7,8 - TCDD PCBS

DOCDATE	OSWER/EPA ID	DOCNUMBER
4/1/1983		C400

TITLE
GUIDELINES FOR DERIVING NUMERICAL NATIONAL WATER QUALITY FOR THE PROTECTION OF AQUATIC ORGANISMS AND THEIR USES

DOCDATE	OSWER/EPA ID	DOCNUMBER
1/1/1985		C447

TITLE
RECOMMENDATIONS OF THE TECHNICAL REVIEW WORK GROUP FOR LEAD FOR AN INTERIM APPROACH

DOCDATE	OSWER/EPA ID	DOCNUMBER
12/1/1996		C511

TITLE
RISK ASSESSMENT GUIDANCE FOR SUPERFUND, VOLUME 1, HUMAN HEALTH EVALUATION MANUAL, INTERIM

DOCDATE	OSWER/EPA ID	DOCNUMBER
1/1/1998		C530

Appendix B

Scope of Work

RD/RA Statement of Work

Iron Horse Park Superfund Site, Operable Unit 3

I. Introduction and Purpose

This Remedial Design/Remedial Action (RD/RA) Statement of Work (SOW) defines the response activities and deliverable obligations that the Appropriate Area of Concern Defendant is obligated to perform in order to implement the Work required under the Consent Decree at Iron Horse Park Superfund Site, Operable Unit 3 in Billerica, Massachusetts (OU3). The activities described in this SOW are based upon the United States Environmental Protection Agency (EPA) Record of Decision (ROD) for OU3 dated September 30, 2004.

II. Definitions and Access

A. All definitions provided in the Consent Decree are incorporated herein by reference.

"Design" shall mean an identification of the technology and its performance and operational specifications, in accordance with all applicable federal, state, and local laws, including, but not limited to:

1. all computations used to size units, determine the appropriateness of technologies, and the projected effectiveness of the system;

2. materials handling and system layouts for any excavation and treatment of soils, if required, the extraction and treatment of groundwater, or in-situ treatment of soil and groundwater, if required, and the decontamination and demolition of facilities to include size and location of units, treatment rates, location of electrical equipment and pipelines, and treatment of effluent discharge areas;

3. scale drawings of all system layouts identified above and including, but not limited to, excavation cross-sections, and well cross-sections;

4. quantitative analysis demonstrating the anticipated effectiveness of the Remedial Design to achieve the Performance Standards;

5. technical specifications which detail the following:

    a. size and type of each major component; and

    b. required performance criteria of each major component;

6. description of the extent of ambient air monitoring including equipment, monitor locations, and data handling procedures; and

7. description of access, land easements and/or other institutional controls required, to be supplied with the construction plans and specifications.

B. Each Appropriate Area of Concern Defendant shall, to the maximum extent practicable, perform the Work required of it under the Consent Decree, solely on property that is owned or controlled by such Appropriate Area of Concern Defendant. If an Appropriate Area of Concern Defendant reasonably believes that access to any other property owned and/or controlled by another Settling Defendant is necessary in order for such Defendant to perform the Work required of it under the Consent Decree, and the person or entity owning and/or controlling such other property should refuse to provide the Appropriate Area of Concern Defendant with the requested access following receipt of a written request for access explaining the circumstances underlying the request and why access is necessary, EPA, in consultation with the Commonwealth, shall promptly determine whether the requested access is necessary to perform the Work. If EPA, in consultation with the Commonwealth, should determine that access to such other property is necessary in order for an Appropriate Area of Concern Defendant to perform the Work required of it under the Consent Decree, and such property is owned or operated by another Settling Defendant, such Settling Defendant shall provide the access as determined by EPA, in consultation with the Commonwealth.

III. Selected Remedies

The ROD describes the individual source control remedies for the seven AOCs which make up Operable Unit 3 at the Site. The major components of the remedies, by AOC, are as follows:

A. The source control remedy for AOC 1, the **B&M Railroad Landfill AOC,** includes:

1. *excavating landfill material from the edge of the wetland to minimize impacts of the cleanup action;*

   Install sheet piling along the edge of the wetland. Excavate waste material along edge of wetland. Place excavated material on landfill

2. *capping landfill material;*

   Cap landfill: grade slopes, install: Double barrier cap (Region 1 Alternative Cap Design). In addition, install storm-water drainage structures (swales, rip-rap, perimeter drains), detention basins and gas vents, as necessary.

3. *erecting a fence around the landfill;*

   Install fence to prevent unauthorized access in order to safeguard the public, and prevent damage to landfill structures.

4. *instituting land use restrictions;*

   Restrict activities (like excavation and construction) which may damage the landfill cap and cause exposure to and migration of landfill contaminants.

5. *restoring wetlands impacted by the cleanup;*

   Install wetland soils and replant with appropriate species as necessary. The limits of the wetland restoration will be determined during remedial design.

6. *inspecting & maintaining the landfill cap & fence on a periodic basis to ensure that it remains effective, inspecting and monitoring institutional controls and inspecting and maintaining restored wetland areas;*

   Maintenance program to inspect landfill structures and institutional controls and restored wetland areas and maintain/repair as necessary.

7. *sampling groundwater periodically to assess the effects of the source control action (capping) & any ongoing impacts from the landfill. Installing, if necessary, new monitoring wells.*

   Monitor groundwater quality downgradient of landfill.

B. The source control remedy for AOC 2, the **RSI Landfill AOC,** includes:

1. *capping landfill material;*

   Cap landfill: grade slopes, install: Single barrier - Solid Waste cap. In addition, install storm-water drainage structures (swales, rip-rap, perimeter drains), detention basins and gas vents, as necessary.

2. *erecting a fence around the landfill;*

   Install fence to prevent unauthorized access in order to safeguard the public, and prevent damage to landfill structures.

3. *instituting land use restrictions;*

   Restrict activities (like excavation and construction) which may damage the landfill cap and cause exposure to and migration of landfill contaminants.

4. *inspecting & maintaining the landfill cap & fence on a periodic basis to ensure that it remains effective and inspecting and monitoring institutional controls;*

   Maintenance program to inspect landfill structures and institutional

controls and maintain/repair as necessary.

5. *sampling groundwater periodically to assess the effects of the source control action (capping) & any ongoing impacts from the landfill. Installing, if necessary, new monitoring wells.*

   Monitor groundwater quality downgradient of landfill

C. The source control remedy for AOC 3, the **B&M Locomotive Shop Disposal Areas AOC,** includes:

1. *capping disposal area;*

   Cap disposal area: Grade slopes, install: Single barrier - Solid Waste cap. In addition, install storm-water drainage structures (swales, rip-rap, perimeter drains), detention basins and gas vents, as necessary.

2. *erecting a fence around the landfill;*

   Install fence to prevent unauthorized access in order to safeguard the public, and prevent damage to landfill structures.

3. *instituting land use restrictions;*

   Restrict activities (like excavation and construction) which may damage the landfill cap and cause exposure to and migration of landfill contaminants.

4. *restoring wetlands impacted by the cleanup;*

   Install wetland soils and replant with appropriate species as necessary.

5. *inspecting & maintaining the landfill cap & fencing on a periodic basis to ensure that it remains effective, inspecting and monitoring institutional controls and inspecting and maintaining restored wetland areas;*

   Maintenance program to inspect landfill structures, fence, and institutional controls and restored wetland areas and maintain/repair as necessary.

6. *sampling groundwater periodically to assess the effects of the source control action (capping) & any ongoing impacts from the landfill. Installing, if necessary, new monitoring wells.*

   Monitor groundwater quality downgradient of landfill

D. The source control remedy for AOC 4, the **Old B&M Oil/Sludge Recycling Area AOC,** includes:

1. *capping contaminated soils with a gravel/asphalt barrier*

Cap area with a gravel/asphalt barrier based on relevant and appropriate Solid Waste capping standards (taking into account previous cap construction activities)

2. *instituting land use restrictions;*

   Restrict activities (excavation and construction) which may damage the cap and permit exposure to contaminated material.

3. *sampling groundwater periodically to assess the effects of the source control action (capping). Installing, if necessary, new monitoring wells.*

   Monitor downgradient groundwater quality

4. *inspecting and maintaining the gravel/asphalt barrier and inspecting and monitoring institutional controls.*

E. The source control remedy for AOC 5, the **Contaminated Soils Area AOC,** includes:

1. *capping contaminated soils;*

   Cap area with a gravel/asphalt barrier based on relevant and appropriate Solid Waste capping standards. Special care will be required to conduct capping activities in rail yard areas;

2. *instituting land use restrictions;*

   Restrict activities (excavation and construction) which may damage the cap and permit exposure to contaminated material.

3. *sampling groundwater periodically to assess the effects of the source control action (capping). Installing, if necessary, new monitoring wells.*

   Monitor downgradient groundwater quality

4. *inspecting and maintaining the gravel/asphalt barrier and inspecting and monitoring institutional controls.*

F. The source control remedy for AOC 6, the **Asbestos Landfill AOC,** includes:

1. *inspecting & maintaining the existing gravel & vegetated soil cap to ensure asbestos material does not become airborne;*

   Maintenance program to inspect existing landfill structures and maintain/repair as necessary.

2. *erecting & maintaining a fence around the landfill;*

   Install fence to prevent unauthorized access in order to safeguard the public, and prevent damage to landfill structures.

3. *instituting land use restrictions;*

   Restrict activities (like excavation and construction, residential use) which may damage the landfill cap and cause exposure to and migration of landfill contaminants (asbestos).

4. *sampling groundwater periodically to assess the effects of the source control action (capping) & any ongoing impacts from the landfill Installing, if necessary, new monitoring wells.*

   Monitor downgradient groundwater quality

5. *inspecting and maintaining the landfill cap and fence and inspecting and monitoring institutional controls.*

G. The source control remedy for AOC 7, the **Asbestos Lagoons AOC,** includes:

1. *capping lagoon material;*

   Cap lagoons: define limits of contamination, including potential satellite deposits, grade slopes/berms, install: soil/fill if necessary for subgrade; Single barrier - Solid Waste cap. In addition, install storm-water drainage structures (swales, rip-rap, perimeter drains), detention basins, as necessary.

2. *erecting a fence around the capped material;*

   Install fence to prevent unauthorized access in order to safeguard the public, and prevent damage to cap structures.

3. *instituting land use restrictions;*

   Restrict activities (like excavation and construction, residential use) which may damage the cap and cause exposure to and migration of capped contaminants (asbestos).

4. *inspecting & maintaining the cap & fence on a periodic basis to ensure that it remains effective and inspecting and monitoring institutional controls;*

   Maintenance program to inspect cap structures and institutional controls and maintain/repair as necessary.

5. *sampling groundwater periodically to assess the effects of the source control action (capping)& any ongoing impacts from the lagoons. Installing, if necessary, new monitoring wells.*

Monitor groundwater quality downgradient of lagoons.

IV. Performance Standards

The remedy for OU3 is a combination of individual source control remedies for each AOC, which together, prevent contact with or exposure to soils containing contaminants above cleanup levels, and prevent migration of contaminants to groundwater or surface water.

This section presents the overall Performance Standards for the source control remedies for each AOC.

The Appropriate Area of Concern Defendant shall design, construct, operate, monitor, and maintain the Remedial Action to achieve these Performance Standards in compliance with all ARARs identified in the ROD.

A. Remedial Action Objectives.

The Remedial Action Objectives as defined in the ROD for the selected remedy for OU3 are:

Human Health

- Soil - Prevent ingestion of lead from soil-derived dust at the B&M Locomotive Shop Disposal Areas, Old B&M Oil/Sludge Recycling Area, and Contaminated Soils Area that results in estimated maternal blood levels of greater than 4.2 μg/dL, a site-specific level protective of a 95th percentile fetal blood lead level of 10 μg/dL. This results in preventing exposure to lead soil concentrations greater than 1,736 mg/kg

- Soil - Prevent exposure to asbestos at the Asbestos Landfill.

- Soil - Prevent exposure to asbestos at the Asbestos Lagoons.

- Groundwater - Limit migration of contaminants in the B&M Landfill, RSI Landfill, B&M Locomotive Shop Disposal Areas, Old B&M Oil/Sludge Recycling Area, Contaminated Soils Area and Asbestos Lagoons into groundwater.

Ecological

- Protect short-tailed shrews and other smalls mammals from exposure to levels of metals associated with a HQ greater than 1 (cadmium) in soils at the B&M Railroad Landfill.
- Protect short-tailed shrews and other smalls mammals from exposure to levels of

metals associated with a HQ greater than 1 (copper and lead) in soils at the B&M Locomotive Shop Disposal Areas.

B. Soil Performance Standards

In accordance with the ROD, soil cleanup levels for the following contaminants apply at the following AOCs:

AOC	Contaminant	Concentration
AOC 1- B&M Railroad Landfill	Cadmium	15.4 mg/kg
AOC 3- B&M Locomotive Shop Disposal Area	Copper Lead	2,213 mg/kg 868 mg/kg
AOC 4- Old B&M Oil/Sludge Recycling Area	Lead	1,736 mg/kg
AOC 5- Contaminated Soils Area	Lead	1,736 mg/kg

In order to meet the goals of preventing contact with or exposure to soils containing contaminants above cleanup levels, and preventing migration of contaminants to groundwater or surface water, soil with residual contamination in excess of these cleanup levels shall be capped according to the Cap Performance Standards outlined below.

C. Cap Performance Standards

1. Region 1 Cap

The Appropriate Area of Concern Defendant shall design the landfill cap to meet the requirements of the RCRA Subtitle C - Hazardous Waste Regulations (40 CFR Parts 260-262 and 264) and the EPA Region I Alternative Cap Design Guidance, February 5, 2001 which are incorporated by reference.

2. Solid Waste Cap

The Appropriate Area of Concern Defendant shall design the landfill cap to meet all Performance Standards set forth in the ROD, including, without limitation, the performance requirements of the Massachusetts Solid Waste Regulations (310 CMR 19.00), (310 CMR 19.112) Landfill Final Cover Systems, (310 CMR 19.113) Alternative Landfill Final Cover System Design, (310 CMR 19.115) Stormwater Controls, (310 CMR 19.116) Surface and Ground Water Protection, and (310 CMR 19.117(3)) Air Quality Protection Systems, which are hereby incorporated by reference. In addition, groundwater, surface water and gas migration

monitoring are required (CMR 19.142(5)(d)), Landfill Post-Closure Requirements.

The design for the cap shall meet the general Performance Standards and general design standards set forth above.

3. Gravel/Asphalt Barrier

The Appropriate Area of Concern Defendant shall design the gravel/asphalt barrier to meet all Performance Standards set forth in the ROD including, without limitation, the requirements of the Massachusetts Department of Environmental Protection "Guidance on the Use, Design, Construction, and Monitoring of Engineered Barriers", November 2002 and the Massachusetts Solid Waste Regulations (310 CMR 19.00) (310 CMR 19.112) Landfill Final Cover Systems, (310 CMR 19.113) Alternative Landfill Final Cover System Design, (310 CMR 19.115) Stormwater Controls, (310 CMR 19.116) Surface and Ground Water Protection, and (310 CMR 19.142(5) Landfill Post-Closure Requirements, which are hereby incorporated by reference.

D. Institutional Controls

The Appropriate Area of Concern Defendant shall implement the institutional controls required pursuant to Section IX of the Consent Decree, Section III of this SOW, and the Institutional Controls Plan required under Section V of this SOW.

V. Remedial Design

The Appropriate Area of Concern Defendant shall develop a final design for the source control remedies described in the ROD and this SOW that meets the Performance Standards specified in Section IV of this SOW. Section V.A of this SOW describes the responsibilities of the Appropriate Area of Concern Defendant for submitting deliverables during the design. Section V.B of this SOW describes the responsibilities of the Appropriate Area of Concern Defendant for conducting Design Project Meetings.

A. Deliverables

The Appropriate Area of Concern Defendant shall submit the following deliverables to EPA and MassDEP, consistent with the Consent Decree, during the Remedial Design. Except where expressly stated otherwise in this SOW, each deliverable shall be subject to review and approval, modification or disapproval by EPA, after reasonable opportunity for review and comment by MassDEP, in accordance with Section XI of the Consent Decree, EPA Approval of Plans and Other Submissions.

1. Design Schedule

Within twenty-one (21) days of the selection of the Supervising Contractor

in accordance with the Consent Decree, the Appropriate Area of Concern Defendant shall submit a Design Schedule for EPA review and approval or modification or disapproval, after reasonable opportunity for review and comment by MassDEP. The Design Schedule shall identify and indicate the dates of performance of all major milestones necessary for completion of the remedial design, including any necessary fieldwork and all required deliverables.

2. Proposed Design Alternatives

a. The Appropriate Area of Concern Defendant may submit design alternative(s) for a specific AOC, provided that the Remedial Action for that AOC with such proposed design alternative(s) meets the Performance Standards for that AOC. Any approval may be subject to requirements for an Explanation of Significant Differences or an Amendment to the Record of Decision. Any submittal of proposed design alternative(s) shall demonstrate, through supporting technical documentation, site-specific analysis and quality assurance/quality control procedures, that upon completion of construction and for the duration of Operation & Maintenance and all Institutional Controls associated with that AOC, the Remedial Action for that AOC with the proposed design alternative(s) shall:

(1) achieve or exceed all Remedial Action Objectives and Performance Standards for that AOC, in a manner that is equivalent to or superior to the applicable design requirements, including those set forth in the above Cap Performance Standards;

(2) ensure protection of human health and the environment;

(3) utilize materials, technologies or methodologies that are clearly demonstrated to have been successful in similar applications; and

(4) comply with all ARARs identified in the ROD relating to the proposed design alternative for that AOC, unless otherwise agreed to by EPA in consultation with MassDEP, provided, however, that no ARAR shall be waived except in compliance with the requirements for waiver of an ARAR set forth in CERCLA and the NCP, and

(5) identify any additional ARARs not identified in the ROD for that AOC, and comply with any such ARARs agreed to by EPA in consultation with MassDEP.

b. Any proposed design alternatives shall be submitted by the Appropriate Area of Concern Defendant at the same time as the submission by such Appropriate Area of Concern Defendant of a proposed Design Schedule as set forth in Section V.A.1 of this SOW or such other time as may be agreed to by the Parties. The Appropriate Area of Concern Defendant shall submit such proposed design

alternatives in accordance with Section XI (EPA Approval of Plans and Other Submissions) of the Consent Decree.

c. Any approval of a proposed design alternative for a specific AOC shall be solely for the purposes of implementing that design alternative under the Consent Decree and this SOW, and not for any other purpose.

3. Design Progress Reports

The Appropriate Area of Concern Defendant shall submit Design Progress Reports to EPA and MassDEP on the 10th day of each month beginning with the month after selection the Remedial Design contractor, and shall continue until the completion of the Remedial Design, unless otherwise determined by EPA. The reports shall summarize all activities that have been conducted in the month preceding the report in connection with the Area(s) of Concern for which the filing party is responsible pursuant to Schedule A to the Consent Decree, and all activities planned for the two months following the report. The Design Progress Reports shall also identify any problems encountered or changes to the schedule (and the resolution of any problems previously identified), and shall summarize the results of sampling, tests and all other data received by the Appropriate Area of Concern Defendant.

4. Project Operations Plan

In accordance with the approved Design Schedule, the Appropriate Area of Concern Defendant shall submit to EPA and MassDEP a Project Operations Plan (POP) with the Appropriate Area of Concern Defendant's Certification. This POP shall be prepared in support of all fieldwork to be conducted according to the Remedial Design Work Plan and shall include, but not be limited to, the following:

a. AOC Management Plan (AMP);

b. Sampling and Analysis Plan (SAP) which includes:

i. a Quality Assurance Project Plan (QAPP); and
ii. a Field Sampling Plan (FSP); and

c. Health and Safety Plan (HSP).

The POP shall be prepared in accordance with Attachment A to this SOW.

5. Environmental Monitoring and Reporting Work Plan

In accordance with the approved Design Schedule, the Appropriate Area of Concern Defendant shall submit to EPA and MassDEP an

Environmental Monitoring and Reporting Work Plan which shall describe in detail all activities that will be conducted to evaluate the effect of the source control remedies on concentrations of contaminants in groundwater and surface water. The monitoring program shall commence with the first sampling event occurring no later than (1) year after selection of the Remedial Design contractor and shall continue until the start of Operation and Maintenance. The Environmental Monitoring and Reporting Work Plan shall address groundwater and surface water contaminant concentrations and shall include but not be limited to the following:

a. a schedule of all activities required for monitoring;

b. a Sampling and Analysis Plan (SAP) which includes:

   i. a Quality Assurance Project Plan (QAPP);

   ii. a Field Sampling Plan (FSP); and

   iii. a description of the statistical analysis, modeling and/or other data interpretation techniques to be used.

The Appropriate Area of Concern Defendant shall prepare this Environmental Monitoring and Reporting Work Plan in accordance with Attachment A to this SOW.

6. Remedial Design Work Plan

In accordance with the approved Design Schedule, the Appropriate Area of Concern Defendant shall submit to EPA and MassDEP a Remedial Design Work Plan which includes a plan for the design of the remedy. The Work Plan shall summarize all activities to be undertaken in connection with the Remedial Design, and shall detail the proposed scope of deliverables for the Remedial Design. The Remedial Design Work Plan shall be consistent with the ROD, this RD/RA SOW, and EPA's RD/RA guidance in effect at the time of submittal.

The Remedial Design Work Plan shall contain detailed descriptions of all activities to be undertaken in connection with any pre-design investigations and conceptual design and design activities, necessary for the design and implementation of the Remedial Action, including but not limited to:

a. Investigations to identify sources of available capping materials, as appropriate;

b. Investigations to verify whether there is sufficient existing subsurface information, including engineering material characteristics, to design the selected remedy;

c. Evaluation of wetland protection/restoration construction alternatives for those areas that will be impacted as a result of the Remedial Action;

d. A field survey to delineate property boundaries, utilities, rights-of-way, and easements as necessary to establish necessary institutional controls; and

e. a title examination and related title work as required in Section IX of the Consent Decree.

7. Conceptual Design (30%)

The Conceptual Design Phase shall consist of pre-design investigations, the 30% Conceptual Design, and an Institutional Controls Plan as described below.

a. In accordance with the Design Schedule, the Appropriate Area of Concern Defendant shall submit to EPA and MassDEP a Conceptual Design Package at the 30% design stage to include, at a minimum, the following:

i. Report presenting the results of pre-design activities, if any;

ii. Basis of design/assumptions;

iii. 30% plans, drawings, sketches, calculations, and technical specifications;

iv. Project delivery strategy;

v. Draft bid documents; and

vi. Regulatory compliance statement.

b. In accordance with the Design Schedule, the Appropriate Area of Concern Defendant shall submit to EPA and MassDEP an Institutional Controls Plan.
This plan shall present the details for implementation of Institutional Controls (IC) and IC Compliance Monitoring. The IC Plan shall include at a minimum:

i. If necessary, an evaluation of the long-term effectiveness and enforceability of various forms of Institutional Controls, including but not limited to deed restrictions, easements, and/or other legal or administrative measures, either individually or in combination, and a recommendation for the appropriate form of Institutional Controls based on the evaluation;

ii. Plans for drafting Institutional Controls, including without limitation plans for satisfying all requirements of Section IX of the Consent Decree, including without limitation plans for drafting the grant, preparing survey plans, and preparing title work;

iii. Plans and schedule for implementation of Institutional Controls;

iv. Plans for IC Compliance Monitoring, including but not limited to schedule for inspections, required document review prior to inspection, inspection checklist, inspection reporting;

v. Plan and schedule for initiating IC Compliance Monitoring; and

vi. Plans for financial assurance for long-term IC Compliance Monitoring.

c. Conduct and report on a constructability review which evaluates the suitability of the project and its components in relation to the Site.

8. Design Completion Phase

The Appropriate Area of Concern Defendant shall complete all activities in the Design Completion Phase, which shall consist of the Pre-Final and Final Design Packages.

a. Pre-Final Design Package at the 95% design stage to include, at a minimum, the following:

i. All revisions required by EPA based upon EPA and MassDEP comments on the Conceptual Design (30%);

ii. Basis of design/assumptions, noting any changes;

iii. 95% plans, drawings, sketches, calculations, and technical specifications;

iv. Draft RA Work Plan and RA POP;

v. Regulatory compliance statement;

vi. Final bid documents;

vii. Draft Operation and Maintenance (OM) Plan to ensure

long-term continued effectiveness of the remedy and conformance with the Performance Standards. This plan shall include at a minimum, the following:

(a) a description of normal operation and maintenance;

(b) a description of potential operational problems;

(c) a description of routine monitoring and analysis;

(d) a description of routine maintenance activities;

(e) a description of contingency operation and monitoring;

(f) an operational safety plan;

(g) a description of equipment;

(h) annual operation and maintenance budget;

(i) record keeping and reporting requirements;

(j) a well maintenance budget; and

(k) post-construction inspection schedules and provisions for implementing such activities.

viii. Draft IC Plan to update the 30% Design, including:

(a) a draft grant, where applicable, specific to the appropriate property and ownership;

(b) for any grant, a draft plan of restricted areas, where timely;

(c) a draft title certification;

(d) a draft IC Compliance Monitoring Plan; and

(e) a draft IC financial assurance plan.

b. Final Design Package at the 100% design stage to include, at a minimum, the following:

i. All revisions required by EPA based upon EPA and MassDEP review of the information provided at the pre-final (95%) design;

ii. Revised basis of design/assumptions, noting any changes;

iii. 100% plans, drawings, sketches, calculations, and technical specifications;

iv. Draft Final RA Work Plan, and RA POP; and

v. Revised constructability review, noting any changes.

9. Demonstration of Compliance Plan

In accordance with the approved Design Schedule, the Appropriate Area of Concern Defendant shall submit to EPA and MassDEP the Demonstration of Compliance Plan. The Demonstration of Compliance Plan shall describe in detail all activities that will be conducted to comply with and/or to demonstrate compliance with all performance standards, including cleanup levels and applicable, relevant and appropriate requirements (ARARs). For ARARs, the Demonstration of Compliance Plan shall:

a. Specify the statute;

b. Specify the citation of the ARAR;

c. Identify if the ARAR is state or federal;

d.. Summarize the requirements of the ARAR;

e. Specify in detail all activities that will be conducted to comply with the ARAR; and,

f. Specify in detail all activities that will be conducted to demonstrate compliance with the ARAR.

When sampling and analysis is conducted to demonstrate compliance, the Demonstration of Compliance Plan shall specify:

a. Sampling locations;

b. Sampling frequency;

c. Sampling methods;

d. Analytical methods;

e. Quality assurance and quality control activities; and

f. Statistical analysis and/or modeling and/or other data interpretation techniques.

The Demonstration of Compliance Plan shall also include all of the construction quality assurance/quality control testing and documentation required to demonstrate that the remedy was properly implemented. The construction quality assurance/quality control component in the Demonstration of Compliance Plan shall include, at a minimum:

a. Checklists for establishing that the required tests and inspections were performed;

b. Standard operation procedures for all field and laboratory tests;

c. The quality assurance and quality control plan for all field and laboratory tests; and, where necessary,

d. Erosion and sediment control plans.

B. Design Project Meetings

Unless otherwise determined by EPA, Design Project Meetings will take place at EPA offices in Boston, Massachusetts.

1. Conceptual Design Meeting

In accordance with the Design Schedule, the Appropriate Area of Concern Defendant shall hold a meeting to discuss the Conceptual Design. The Appropriate Area of Concern Defendant shall present and discuss, at a minimum, the results of any pre-design activities; the design criteria; the project delivery strategy; conceptual sketches; calculations; and outline of the required technical specifications; a preliminary construction schedule; organizational roles; and compliance with ARARs. The Appropriate Area of Concern Defendant shall document meeting minutes and submit responses to EPA and MassDEP comments in a written letter.

2. Other Design Meetings

The Appropriate Area of Concern Defendant shall hold meetings appropriate to discuss specific design or deliverable issues. Such meetings shall be held in accordance with the Design Schedule, or as agreed upon by EPA, MassDEP and the Appropriate Area of Concern Defendant.

VI. Remedial Action

The Remedial Action activities shall include, but are not limited to: (a) submission of final RA Work Plan; (b) pre-construction conference; (c) commencement of construction; (d) meetings during construction; (e) RA Progress Reports; (f) development and implementation of Operation and Maintenance Plan and Post-Construction Monitoring Plan; (g) final construction inspection; and (h) final remedial construction report. The

Appropriate Area of Concern Defendant shall submit to EPA and MassDEP any required deliverables as stated herein for each of these Remedial Action activities. Each deliverable shall be subject to review and approval or modification by EPA, after reasonable opportunity for review and comment by MassDEP, in accordance with Section XI of the Consent Decree, EPA Approval of Plans and Other Submissions.

A. Remedial Action Work Plan and Revised POP

Within thirty (30) days of: approval of the Remedial Design, the Appropriate Area of Concern Defendant shall submit to EPA and MassDEP, a final Remedial Action Work Plan and schedule for implementing the Remedial Action and associated activities, consistent with the approved Remedial Design. Activities contained or described in their entirety in other plans may be incorporated into the Remedial Action (RA) Work Plan. The RA Work Plan shall contain, at a minimum:

1. a description of the activities necessary to implement all components of the Remedial Action, in accordance with the Remedial Design, the SOW, the Consent Decree and the ROD, including, but not limited to, the following:

    a. award of project contracts, including any agreements with off-site treatment and/or disposal facilities;

    b. contractor mobilization/site preparation, including construction of necessary utility hookups;

    c. community communications plan, including, communication with local officials and affected citizens regarding hours of construction, truck routes, and community safety issues; and

    d. construction, and quality assurance/quality control testing of all components of the remedy.

2. A revised POP shall be prepared in support of all field work to be conducted according to the approved RA Work Plan.

3. a detailed schedule for completing the activities identified in Section VI, including the required deliverables and reporting requirements, and an identification of milestone events in the performance of the Remedial Action.

B. Pre-construction Conference

Within 21 days of receiving EPA's approval or modification of the RA Work Plan, the Appropriate Area of Concern Defendant shall hold a Pre-Construction Conference with EPA, MassDEP and their respective representatives.

C. Commencement of Construction

Within 30 days of receiving EPA's approval or modification of the Remedial Action Work Plan or such other date set forth in the schedule contained therein, the Appropriate Area of Concern Defendant shall commence the Remedial Action activities as specified in that Plan.

D. Meetings During Construction

During the construction period, the Appropriate Area of Concern Defendant and its construction contractor(s) shall meet monthly with EPA and MassDEP regarding the progress and details of construction. If, during the construction of the Remedial Action, conditions warrant modifications of the design, construction, and/or schedules, the Appropriate Area of Concern Defendant may propose such design, construction or schedule modifications. Following approval by EPA, after reasonable opportunity for review and comment by MassDEP, the Appropriate Area of Concern Defendant shall implement the design or construction modifications required. Conference calls may be substituted for meetings upon approval of EPA.

The Appropriate Area of Concern Defendant and/or EPA may schedule additional meetings as reasonably necessary during construction.

E. RA Progress Reports

The Appropriate Area of Concern Defendant shall submit RA Progress Reports to EPA and MassDEP no later than the 10th day of each month beginning with the month after submission of the final RA Work Plan. The reports shall summarize all activities that have been conducted in the month preceding the report, and all activities planned for the two months following the report. The RA Progress Reports shall also identify any problems encountered or changes to the schedule (and the resolution of any problems previously identified), and shall summarize the results of sampling, tests and all other data received by the Appropriate Area of Concern Defendant.

F. Operation and Maintenance Plan and Post-Construction Monitoring Plan

Within 30 days of the 75% construction complete date, the Appropriate Area of Concern Defendant shall submit to EPA and MassDEP: a) an Operation and Maintenance Plan to update the 95% Design to ensure the long-term, continued effectiveness of each component of the Remedial Action; and b) a Post-Construction Monitoring Plan to monitor achievement and conformance with the Performance Standards and evaluate the protectiveness of the remedy . These plans shall include, at a minimum, the following:

1. Operation and Maintenance Plan

   a. a periodic evaluation of the stability/condition of all cover systems;

   b. a description of normal operations and maintenance of all components of the remedy;

c. measures to prevent unauthorized access through fences;

d. an operational safety plan;

e. a description of major equipment;

f. operation and maintenance budget;

g. record keeping and reporting requirements;

h. a well maintenance program including, at a minimum, the following:

i. a provision for prompt and proper abandonment, as appropriate, of wells used during earlier activities which are currently unusable or which become unusable during the Remedial Action or Operation and Maintenance activities;

ii. a provision for inspection, continued maintenance and repair, if necessary, of all wells used during earlier activities and not abandoned;

iii. a provision for continued maintenance or abandonment of wells used during earlier activities and additional wells used during the Remedial Design, Remedial Action, and Operation and Maintenance phases; and

i. site closure and post-closure monitoring:

i. a cost estimate for post-closure care consistent with 40 C.F.R. Part 264 and 310 CMR 19.051;

ii. establishment of a financial assurance mechanism for post-closure care consistent with 40 C.F.R. Part 264; and

iii. post-closure activities schedule consistent with 40 C.F.R. Part 264 and 310 CMR 19.142.

2. Post-Construction Monitoring Plan

The Post-Construction Monitoring Plan shall be implemented as required under Section VI.I.

a. Groundwater Monitoring

The Groundwater Monitoring Plan shall involve monitoring designed to evaluate the effect of the source control remedy on concentrations of contaminants in groundwater. This plan shall be

consistent with the requirements of 40 C.F.R. 264.97, and shall include at a minimum, the following:

i. sampling locations;

ii. sampling frequency; and

iii. appropriate statistical modeling or other data interpretation techniques.

b. Revised POP

A revised POP shall be prepared in support of all fieldwork to be conducted according to the Post-Construction Monitoring Plan. This revised POP shall be prepared in accordance with Attachment A to this SOW.

G. Final (Pre-Certification) Construction Inspection

In accordance with Section XIV of the Consent Decree, within 30 days after the Appropriate Area of Concern Defendant concludes that the construction has been fully performed (100% complete) at an AOC for which it is responsible, the Appropriate Area of Concern Defendant shall schedule and the parties shall conduct a Final (Pre-Certification) Construction Inspection. This inspection shall include participants representing the Appropriate Area of Concern Defendant, EPA and MassDEP. The inspection and the determination regarding completion by EPA shall be conducted in accordance with Section XIV of the Consent Decree.

H. Final Remedial Construction Report

When construction of the Remedial Action is complete at any particular AOC, including all actions taken in response to written comments received as a result of the Final (Pre-Certification) Construction Inspection, the Appropriate Area of Concern Defendant shall submit the Final Remedial Construction Report for the appropriate Area of Concern (to be entitled "Construction Report") to EPA and MassDEP. The Construction Report shall include, at a minimum, all documents required by Section XIV of the Consent Decree and the following documentation:

1. a synopsis of the work defined in the SOW and 100% Remedial Design, and a synopsis of the work actually performed;

2. an explanation of any modifications to work in the SOW and the 100% Remedial Design, and why such modifications were necessary to implement the remedy;

3. as-built drawings and specifications for all components of the remedy;

4. a final inspection check-list;

5. all data and information necessary to demonstrate compliance according to the approved Demonstration of Compliance Plan (including construction quality assurance);

6. a detailed explanation as to how the Appropriate Area of Concern Defendant addressed each ARAR; and

7. conclusions regarding conformance of the remedy with the Performance Standards.

I. Operation and Maintenance and Post-Construction Monitoring

Within 7 days of receiving Completion of Construction Certification from EPA, the Appropriate Area of Concern Defendant shall implement Operation and Maintenance and Post-Construction Monitoring activities in accordance with the terms and schedules set forth in the Operation and Maintenance Plan and Post-Construction Monitoring Plan approved by EPA.

J. Institutional Controls

Upon notification from EPA, the Appropriate Area of Concern Defendant shall implement all required Institutional Controls, including without limitation, any grant, in accordance with Section IX of the Consent Decree and all approved work plans.

Attachment A to Statement of Work - Requirements for Project Operations Plans

Before any field activities commence at an Area of Concern ("AOC"), the Appropriate Area of Concern Defendant shall submit several AOC-specific plans to establish procedures to be followed by such Appropriate Area of Concern Defendant in performing field, laboratory, and analysis work. These AOC-specific plans include the:

1. AOC Management Plan (AMP)
2. Sampling and Analysis Plan (SAP) which is made up of:

    2.1. Quality Assurance Project Plan (QAPP)
    2.2. Field Sampling Plan (FSP)

3. Health and Safety Plan (HSP).

The AMP, QAPP, FSP, and HSP, form the Project Operations Plan (POP). The four components of the POP are described below:

The format and scope of each Plan shall be modified as needed to describe the sampling, analyses, and other activities that are clarified as the RD/RA progresses. EPA may modify the scopes of these activities at any time during the RD/RA at the discretion of EPA in response to the evaluation of RD/RA results, changes in RD/RA requirements, and other developments or circumstances. The Appropriate Area of Concern Defendant may also propose changes to EPA.

Submission and approval of each Plan shall be governed by Section XI (EPA Approval of Plans and Other Submissions) of the Consent Decree.

1. AOC Management Plan (AMP)

The AOC Management Plan (AMP) shall describe how the Appropriate Area of Concern Defendant will manage the project to complete the Work required at the AOC. The overall objective of the AOC Management Plan is to provide EPA and MassDEP with a written understanding and commitment of how access, security, contingency procedures, management responsibilities, waste disposal, budgeting, and data handling are being managed by the Appropriate Area of Concern Defendant. Specific objectives and provisions of the AOC Management Plan shall include, but are not limited to the following:

a. Provide a map and list of properties, the property owners, and addresses of owners to whose property access may be required.

b. Clearly indicate the exclusion zone, contamination reduction zone, and clean area for on-site activities, as applicable.

c. Establish necessary procedures and provide sample letters to land owners to arrange field activities and to inform EPA of access-related problems and issues, including issues relating to access to that portion of AOC 5 that is an active railroad yard.

d. Provide for the security of government and private property on the AOC.

e. Prevent unauthorized entry to the AOC, which might result in exposure of persons to potentially hazardous conditions.

f. Establish the location of a field office for on-site activities at the AOC. Supporting documents for each element of Work shall be located at the field office (HSP, FSP, etc.).

g. Provide contingency and notification plans for potentially dangerous activities associated with the RD/RA at the AOC.

h. Monitor airborne contaminants released by activities at the AOC that may affect the local populations.

i. Describe how all Work areas at the AOC will be maintained and restored to meet all performance standards. Restored areas shall have native vegetation established, if required by the Work for that AOC, and not allow erosion.

j. Communicate to EPA, MassDEP, and the public the organization and management of the RD/RA activities at the AOC, including key personnel and their responsibilities.

k. Provide a list of contractors and subcontractors of the Appropriate Area of Concern Defendant in the RD/RA and a description of their activities and roles.

l. Provide regular financial reports of the Appropriate Area of Concern Defendant's expenditures on the RD/RA activities at the AOC.

m. Provide for the proper disposal of materials used and wastes generated during the RD/RA (e.g., drill cuttings, extracted ground water, protective clothing, disposable equipment). These provisions shall be consistent with the off-site disposal requirements of SARA, RCRA, and applicable state laws. The Appropriate Area of Concern Defendant, or their authorized representative, or another party acceptable to EPA and MassDEP shall be identified as the generator of wastes for the purpose of regulatory or policy compliance at the AOC.

2. Sampling and Analysis Plan (SAP)

The SAP shall be consistent with Section VIII of the Consent Decree and shall be prepared by the Appropriate Area of Concern Defendant. The SAP is not a separate document but consists of the following two separate volumes:

1. a Quality Assurance Project Plan (QAPP) that describes the policy, organization, functional activities, and the quality assurance and quality control protocols necessary to achieve the data quality objectives dictated by the intended use of the data; and

2. the Field Sampling Plan (FSP) that provides guidance for all fieldwork at an AOC by defining in detail the sampling and data-gathering methods to be used on at an AOC.

The first component of the SAP shall be the framework of all anticipated field activities at an

AOC (e.g., sampling objectives, evaluation of existing data, standard operating procedures) and contain specific information on the initial field work (e.g., sampling locations and rationale, sample numbers and rationale, analyses of samples). During the RD/RA, the SAP shall be revised as necessary to cover each round of field or laboratory activities. The purpose of the SAP is to ensure that sampling data collection activities will be comparable to and compatible with previous data collection activities performed at the AOC while providing a mechanism for planning and approving field activities. The overall objectives of the two documents comprising the SAP are as follows:

a. to document specific objectives, procedures, and rationales for fieldwork and sample analytical work;

b. to provide a mechanism for planning and approving AOC and laboratory activities;

c. to ensure that sampling and analysis activities are necessary and sufficient; and

d. to provide a common point of reference for the Appropriate Area of Concern Defendant to ensure the comparability and compatibility of all objectives and the sampling and analysis activities.

To achieve this last objective, the SAP shall document all field and sampling and analysis objectives as noted above, as well as all data quality objectives and specific procedures/protocols for field sampling and analysis.

The following critical elements of the SAP shall be described for each medium to be sampled (e.g., ground water, surface water, soil, sediment, air, and biota) at the AOC and for each sampling event:

a. sampling objectives {There can be many objectives; for example, engineering related (well yields, zone of influence, performance monitoring, demonstration of attainment, five year review, etc.};

b. data quality objectives, including data uses and the rationale for the selection of analytical levels and detection limits (see Guidance for the Data Quality Objectives Process, EPA QA/G-4 (EPA/600/r-96/055, September 1994); Draft Data Quality Objectives Decision Errors Feasibility Trials (DEFT) Software EPA/600/R-96/056, September 1994); and Final Guidance Data Usability in Risk Assessment (Part A) (publication 9285.7-09A, April 1992, PB92-963356); Guidance for Data Usability in Risk Assessment (Part B). (publication 9285.7-09B, May 1992, PB92-963362)

c. AOC background update, including an evaluation of the validity, sufficiency, and sensitivity of existing data;

d. sampling locations and rationale;

e. sampling procedures and rationale and references;

f. numbers of samples and justification;

g. numbers of field blanks, trip blanks, and duplicates;

h. media to be sampled (e.g., ground water, surface water, soil, sediment, air, and buildings, facilities, and structures, including surfaces, structural materials, and residues);

i. sample equipment, containers, minimum sample quantities, sample preservation techniques, maximum holding times, etc.;

j. instrumentation and procedures for the calibration and use of portable air, soil-, or water-monitoring equipment to be used in the field;

k. chemical and physical parameters in the analysis of each sample;

l. chain-of-custody procedures must be clearly stated (see EPA NEIC Policies and Procedures Manual, EPA 330/9-78 001-R) May 1978, revised May 1986;

m. procedures to eliminate cross-contamination of samples (such as dedicated equipment);

n. sample types, including collection methods and if field and laboratory analyses will be conducted;

o. laboratory analytical procedures, equipment, and detection limits;

p. equipment decontamination procedures;

q. consistency with the other parts of the Work Plan(s) for the AOC by having identical objectives, procedures, and justification, or by cross-reference;

r. analysis from each medium to be sampled for all) inorganic and organic analytes;

s. analysis for other potential AOC-specific contaminants in each media;

t. analysis of selected background and contaminated ground water samples for substances listed in RCRA Appendix IX, unless the exclusion of certain substances on this list is approved by EPA; and

u. for any limited field investigation (field screening technique), provisions for the collection and laboratory analysis of parallel samples and for the quantitative correlation analysis in which screening results are compared with laboratory results.

The SAP must be the framework of all anticipated field activities (e.g., sampling objectives, evaluation of existing data, standard operating procedures) and contain specific information on each round of field sampling and analysis work (e.g., sampling locations and rationale, sample numbers and rationale, analyses of samples). During the RD/RA, the SAP shall be revised as necessary to cover each round of field or laboratory activities. Revisions or a statement regarding the need for revisions shall be included in each deliverable describing all new field

work.

The SAP shall allow for the Appropriate Area of Concern Defendant to notify EPA, at a minimum, three weeks before field sampling or monitoring activities commence at the AOC. The SAP shall also allow split, replicate, or duplicate samples to be taken by EPA (or their contractor personnel). At the request of EPA the Appropriate Area of Concern Defendant shall provide these samples in appropriately pre-cleaned containers to the government representatives. Identical procedures shall be used to collect the appropriate Area of Concern Defendant's and the parallel split samples unless otherwise specified by EPA. Several references shall be used to develop the SAP, for example:

1. Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA (OSWER Directive 9355.3-01, EPA/540/G-89/004, October 1988);

2. Test Methods for Evaluating Solid Waste, Physical/Chemical Method (EPA Pub. SW-846, Third Edition, most recent update);

3. EPA Requirements for Quality Assurance Plans, EPA QA/R-5 (EPA/240/B-01/003) March 2001

4. Region I, EPA-New England Compendium of Quality Assurance Project Plan Requirements and Guidance (U.S. EPA-New England Region I Quality Assurance Unit Staff, Office of Environmental Measurement and Evaluation; October 1999 Final).

5. Guidance for the Data Quality Objectives Process, EPA QA/G-4 (, EPA/600/r-96/055, September 1994);

6. Draft Data Quality Objectives Decision Errors Feasability Trials (DEFT) Software EPA/600/R-96/056, September 1994)

7. Guidance for the Data Quality Objectives Process for Hazardous Waste, EPA QA/G-4HW Draft

8. Guidance for Preparing Standard Operating Procedures(SOPs) EPA QA/G-6 (EPA/240/B-01/004) March 2001

9. Region I, EPA-New England Data Validation Functional Guidelines for Evaluating Environmental Analyses, Revised December 1996

10. Guidance for Data Quality Assessment: Practical Methods for Data Analysis, EPA QA/G-9 (EPA/600/R-96-084, QA 97 Version, January 1998)

2.1 QUALITY ASSURANCE PROJECT PLAN (QAPP)

The Quality Assurance Project Plan (QAPP) shall document in writing the AOC-specific objectives, policies, organizations, functional activities, sampling and analysis activities and specific quality assurance/quality control activities designed to achieve the data quality

objectives (DQOs) of the RD/RA in the AOC. The QAPP developed by the Appropriate Area of Concern Defendant for this project shall document quality control and quality assurance policies, procedures, routines, and specifications at the AOC.

Project activities throughout the RD/RA shall comply with the QAPP. QAPP sampling and analysis objectives and procedures shall be consistent with EPA Requirements QAPP for Environmental Data Operations (EPA QA/R-5) and appropriate EPA handbooks, manuals, and guidelines including Region I, EPA-New England Compendium of Quality Assurance Project Plan Requirements and Guidance (October 1999 Final)(the "Compendium"), Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (EPA Pub. SW-846, Third Edition, latest update) (CLP Routine Analytical Services, RAS, latest Statement of Work should be used) and Guidelines Establishing Test Procedures for the Analysis of Pollutants (40 CFR, Part 136), Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air, (EPA-600/4-84-041 April 1984)

All the QAPP elements identified in EPA QA/R-5 and the "Compendium" must be addressed.

As indicated in EPA QA/R-5 and the "Compendium", a list of essential elements must be considered in the QAPP for the RD/RA. If a particular element is not relevant to a project and therefore excluded from the QAPP, specific and detailed reasons for exclusion must be provided.

Information in a plan other than the QAPP may be cross-referenced clearly in the QAPP provided that all objectives, procedures, and rationales in the documents are consistent, and the reference material fulfills requirements of EPA/QA/R-5. Examples of how this cross reference might be accomplished can be found in the Guidance for the Data Quality Objectives Process (EPA/600/R-96/055) and the Data Quality Objectives decision Errors Feasibility Trials (DEFT) Software (EPA/600/R-96/056). EPA-approved references, or equivalent, or alternative methods approved by EPA shall be used, and their corresponding EPA-approved guidelines should be applied when they are available and applicable.

Laboratory QA/QC Procedures

The QA/QC procedures and SOPs for any laboratory (both fixed and mobile) used during the RD/RA shall be included in the Appropriate Area of Concern Defendant's QAPP. When this work is performed by a contractor to a private party, each laboratory performing chemical analyses shall meet the following requirements:

1) be approved by the State Laboratory Evaluation Program, if available;

2) have successful performance in one of EPA's National Proficiency Sample Programs (i.e., Water Supply or Water Pollution Studies or the State's proficiency sampling program);

3) be familiar with the requirements of 48 CFR Part 1546 contract requirements for quality assurance; and

4) have a QAPP for the laboratory including all relevant analysis. This plan shall be referenced as part of the contractor's QAPP.

Data Validation Procedures

The Appropriate Area of Concern Defendant is required to certify that a representative portion of the data has been validated by a person independent of the laboratory according to the Region I, EPA-New England Data Validation Functional Guidelines for Evaluating Environmental Analyses Revised December 1996 (amended as necessary to account for the differences between the approved analytical methods for the project and the current Contract Laboratory Program Statements of Work(CLP SOW). A data validation reporting package as described in the guidelines cited above must be delivered at the request of the EPA project manager. Approved validation methods shall be contained in the QAPP.

The independent validator shall not be the laboratory conducting the analysis and should be a person with a working knowledge of or prior experience with EPA data validation procedures. The independent validator shall certify that the data has been validated, discrepancies have been resolved if possible, and the appropriate qualifiers have been provided.

Data Package requirements:

The Appropriate Area of Concern Defendant must require and keep the complete data package for the AOC and make it available to EPA on request in order for EPA to conduct an independent validation of the data. The complete data package shall consist of all results, the raw data, and all relevant QA/QC information. The forms contained in the data validation functional guidelines must be utilized to report the data when applicable. Raw data includes the associated chromatograms and the instrument printouts with area and height peak results. The peaks in all standards and samples must be labeled. The concentration of all standards analyzed with the amount injected must be included. All laboratory tracking information must also be included in the data package. An example data package deliverable is listed below:

1) a summary of positive results and detection limits of non-detects with all raw data;
2) tabulate surrogate recoveries and QC limits from methods 3500 and 8000 in SW-846 and all validation and sample raw data;
3) tabulated matrix spike/matrix spike duplicate recoveries, relative percent differences, spike concentrations, and QC limits from methods 3500 and 8000 in SW-846 and all validation and sample raw data;
4) associated blanks (trip, equipment, and method with accompanying raw data for tests);
5) tabulated initial and continuing calibration results (concentrations, calibration factors or relative response factors and mean relative response factors, % differences and % relative standard deviations) with accompanying raw data;
6) tabulated retention time windows for each column;
7) a record of the daily analytical scheme (run logbook, instrument logbook) which includes samples and standards order of analysis;
8) the chain of custody for the sample shipment groups, DAS packing slip, DAS analytical specifications;

9) a narrative summary of method and any problems encounter during extraction or analysis;
10) tabulated sample weights, volumes, and % solids used in each sample calculation;
11) example calculation for positive values and detection limits; and
12) SW-846 method 3500 and 8000 validation data for all tests.

The forms contained in Chapter 1 of SW-846 (Second Edition 1982 as amended by Update I, April 1984, and Update II, April 1985) or the current CLP SOW forms must be utilized to report the data when applicable. Raw data includes the associated chromatograms and the instrument printouts with area and height peak results. The peaks in all standards and samples must be labeled. The concentration of all standards analyzed with the amount injected must be included. All internal and external laboratory sample tracking information must be included in the data package.

2.2 FIELD SAMPLING PLAN (FSP)

The objective of the Field Sampling Plan is to provide EPA, MassDEP, and the Appropriate Area of Concern Defendant with a common written understanding of all field work to be performed at the AOC. The FSP should be written so that a field sampling team unfamiliar with the Site or the AOC would be able to gather the samples and field information required. Guidance for the selection of field methods, sampling procedures, and custody can be acquired from the Compendium of Superfund Field Operations Methods (OSWER Directive 9355.0-14, EPA/540/P-87/001), December 1987, which is a compilation of demonstrated field techniques that have been used during remedial response activities at hazardous waste sites. The FSP shall be AOC-specific and shall include the following elements:

1. AOC Background. If the analysis of the existing AOC details is not included in the Work Plan or in the QAPP, it must be included in the FSP. This analysis shall include a description of the AOC and surrounding areas and a discussion of known and suspected contaminant sources, probable transport pathways, and other information about the AOC that is the subject of the FSP. The analysis shall also include descriptions of specific data gaps and ways in which sampling is designed to fill those gaps. Including this discussion in the FSP will help orient the sampling team in the field.

2. Sampling Objectives. Specific objectives of sampling effort that describe the intended uses of data must be clearly and succinctly stated.

3. Sampling Location and Frequency. This section of the FSP identifies each matrix to be collected and the constituents to be analyzed. Tables shall be used to clearly identify the number of samples, the type of sample (water, soil, etc.), and the number of quality control samples (duplicates, trip blanks, equipment blanks, etc.). Figures shall be included to show the locations of existing or proposed sample points.

4. Sample Designation. A sample numbering system shall be established for the project. The sample designation should include the sample or well number, the sample

round, the sample matrix (e.g., surface soil, ground water, soil boring), and the name of the Site.

5. Sampling Equipment and Procedures. Sampling procedures must be clearly written. Step-by-step instructions for each type of sampling that are necessary to enable the field team to gather data that will meet the Data Quality Objectives (DQOs). A list should include the equipment to be used and the material composition (e.g., Teflon, stainless steel) of equipment along with decontamination procedures.

6. Sampling Handling and Analysis. A table shall be included that identifies sample preservation methods, types of sampling jars, shipping requirements, and holding times. Examples of paperwork such as traffic reports, chain-of-custody forms, packing slips, and sample tags filled out for each sample as well as instructions for filling out the paperwork must be included. Field documentation methods including field notebooks and photographs shall be described.

The Field Sampling Plan submitted as a part of the Project Operations Plan for the RD/RA for the AOC shall be sufficiently detailed to carry out the study, and shall provide data needed to address the objective of the study and to complete the study. The FSP shall be related (by cross-references) to the other requirements in the Project Operations Plan.

In the Field Sampling Plan for the RD/RA for the AOC, the Appropriate Area of Concern Defendant shall include plans that describe how each of the following and other necessary studies shall be addressed:

1) site survey for the AOC;

2) soils and sources of contaminants;

3) subsurface and hydrogeological factors for overburden and bedrock;

4) air quality;

5) surface water and sediment sampling;

6) ecological assessment; and

7) monitoring and sampling;

3. HEALTH AND SAFETY PLAN (HSP)

The objective of the AOC-specific Health and Safety Plan is to establish the procedures, personnel responsibilities and training necessary to protect the health and safety of all on-site personnel during the RD/RA. The plan shall provide for routine but hazardous field activities and for unexpected emergencies.

The AOC-specific health and safety requirements and procedures in the HSP shall be updated based on an ongoing assessment of AOC conditions, including the most current information on each medium. For each field task during the RD/RA, the HSP shall identify:

1. possible problems and hazards and their solutions;

2. environmental surveillance measures;

3. specifications for protective clothing;

4. the appropriate level of respiratory protection;

5. the rationale for selecting that level; and

6. criteria, procedures, and mechanisms for upgrading the level of protection and for suspending activity, if necessary.

The HSP shall also include the delineation of any exclusion zone on a map and in the field. The HSP shall describe the on-site person responsible for implementing the HSP for the Appropriate Area of Concern Defendant's representatives at the AOC, protective equipment personnel decontamination procedures, and medical surveillance. The following documents shall be consulted:

1. Interim Standard Operations Safety Guides (Hazardous Response Support Division, Office of Emergency and Remedial Response EPA, Wash. D.C. 1982);

2. Superfund Public Health Evaluation Manual (OSWER Directive 9285.41, EPA/540/1-861060, EPA 1986);

3. Hazardous Waste Operations and Emergency Response Standard (Department of Labor, Occupational Safety and Health Administration, (OSHA) 29 CFR Part 1910.120); and

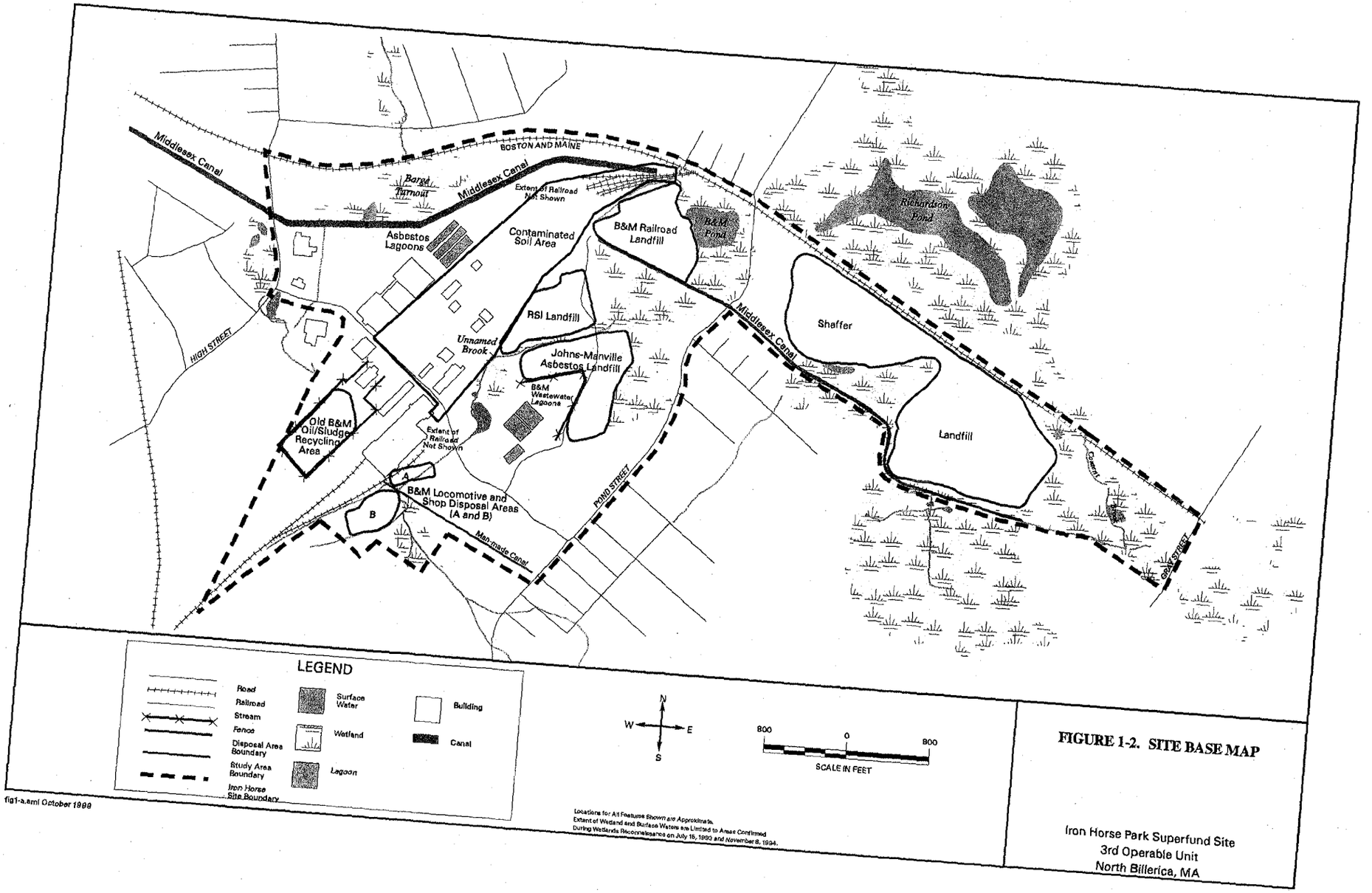
4. Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities: Appendix B (NIOSH/OSHA/EPA 1986).

OSHA regulations at 40 CFR 1910 and Chapter 9 of the Interim Standard Operating Safety Guide, which describes the routine emergency provisions of a site-specific health and safety plan, shall be the primary reference used by the Appropriate Area of Concern Defendant in developing and implementing the Health and Safety Plan.

The measures in the HSP shall be developed and implemented to ensure compliance with all applicable state and Federal occupational health and safety regulations. The HSP shall be updated at the request of EPA during the course of the RD/RA and as necessary.

Appendix C

Map of Areas of Concern



Locations for All Features Shown are Approximate.
Extent of Wetland and Surface Waters are Limited to Areas Confirmed During Wetlands Reconnaissance on July 16, 1993 and November 8, 1994.

FIGURE 1-2. SITE BASE MAP

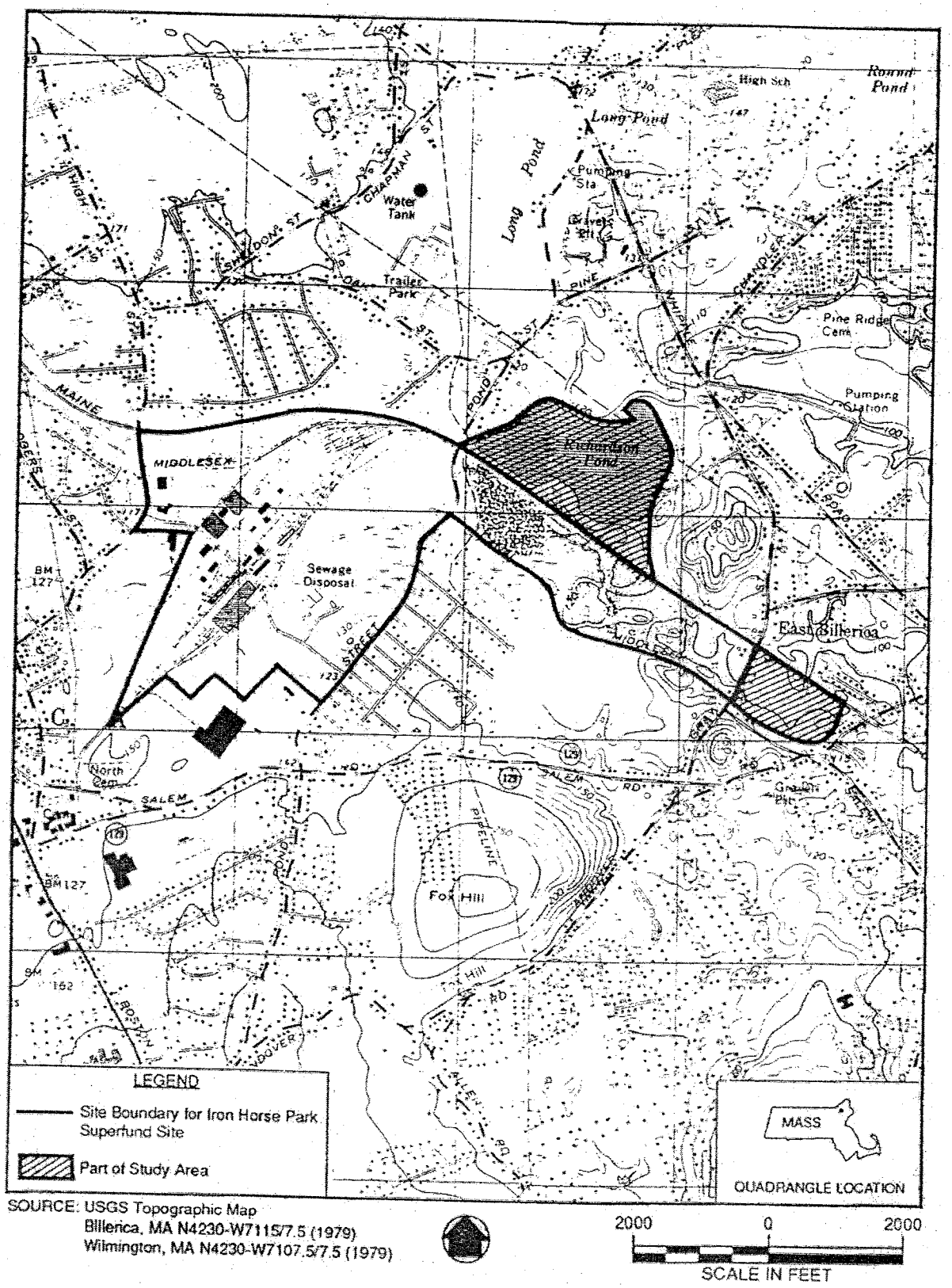
Iron Horse Park Superfund Site
3rd Operable Unit
North Billerica, MA

fig1-a.aml October 1998

Metcalf & Eddy

Appendix D

Map of the Site



SOURCE: USGS Topographic Map
Billerica, MA N4230-W7115/7.5 (1979)
Wilmington, MA N4230-W7107.5/7.5 (1979)

FIGURE 1-1. GEOGRAPHICAL LOCATION OF THE IRON HORSE PARK SUPERFUND SITE