IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF MICHIGAN

UNITED STATES OF AMERICA,	)	
	)	
Plaintiff,	)	
	)	
v.	)	No. 1:99-CV-414
	)	
ROBERT BOSCH LLC,	)	
	)	
Defendant.	)	

FIRST MODIFICATION TO CONSENT DECREE

Plaintiff, the United States of America on behalf of the United States Environmental Protection Agency ("EPA"), and Robert Bosch LLC ("Bosch")[1] are parties (collectively, "Parties") to a Consent Decree (the "Consent Decree" or "Decree") in this civil action entered by this Court on October 5, 1999.

On June 3, 1999, the United States filed a Complaint pursuant to Sections 106 and 107 of the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA"), 42 U.S.C. § 9606 and 9607, against Bosch seeking: (1) reimbursement of costs incurred by the United States for response actions undertaken at or in connection with the Bendix/Bosch Braking Systems Superfund Site (the "Site"), located in St. Joseph, Michigan, together with accrued

[1] The Consent Decree was entered into by Robert Bosch Corporation, a Delaware Corporation. However, subsequent to the entry of the Consent Decree, Robert Bosch Corporation was converted to a Delaware Limited Liability Company, and its name changed to Robert Bosch LLC.

interest; and (2) performance of studies and response work by Bosch at the Site not inconsistent with the National Contingency Plan, 40 C.F.R. Part 300 (as amended) (the "NCP"). The Parties have agreed to certain changes to the Consent Decree as reflected in this First Material Modification ("Modification").

A. The Site, which includes an iron casting foundry and machine shop, currently owned and operated by Bosch, is located at 3737 Red Arrow Highway, in Berrien County, Michigan, approximately four miles south of the City of St. Joseph, and approximately one-half mile from the eastern shore of Lake Michigan.

B. Simultaneously with the filing of the Complaint, the United States lodged the Consent Decree, attached to this Modification as Appendix 1,[2] which the Court entered on October 5, 1999. The Consent Decree requires Bosch to implement clean-up actions selected by EPA in the ROD for the Site including performing a contingent groundwater remedy, as set forth in the ROD, if contamination is discovered that exceeds triggering levels established in the Decree. Paragraph 54 of the Consent Decree also requires Bosch to reimburse the United States for past response costs that it incurred in investigating Site contamination. Paragraph 55 requires Bosch to pay the United States all Future Oversight Costs not inconsistent with the National Contingency Plan, but limits Bosch's liability for Oversight Costs as defined in the Consent Decree.

[2] The Consent Decree, including a portion of EPA's Record of Decision ("ROD") for the remedial action at the Site, which was filed as Appendix A to the Consent Decree, is attached to this Modification as Appendix 1 for the Court's convenience since the Consent Decree was lodged and entered before the Electronic Case Filing system was in use.

C. There are two groundwater plumes of concern at the Site. The western plume migrates to the north and west to Lake Michigan. The eastern plume migrates north and east to Hickory Creek. There are residences in the vicinity of the western plume and commercial buildings in the vicinity of the eastern plume. The primary components of the remedial action required under the Consent Decree consist of natural attenuation of the contaminated groundwater plumes, maintenance of the existing caps over the eastern source area loading dock and the south lagoon (the south lagoon was closed in 1978 with the installation of a Michigan Department of Natural Resources-approved clay cap), and soil vapor extraction at the eastern plume.[3] The Consent Decree (¶ 26.b-c) also requires Bosch to refrain from using the groundwater and to submit to EPA for review and approval an easement in substantially the same form as the document attached to the Consent Decree as Appendix E for those properties owned or controlled by Bosch where access and/or land/water use restrictions are needed in order to implement the Consent Decree.

D. Additionally, Paragraphs 11.b and 13.b of the Consent Decree and Section II.e of the Statement of Work ("SOW"), attached to the Consent Decree as Appendix C, require Bosch to develop contingency plans to identify possible alternative corrective actions to address exceedances, or projected exceedances, of the Performance Standards and the Point of Compliance criteria. In a letter dated August 30, 2007, EPA provided notice to Bosch of exceedances of the proposed Point of Compliance criteria documented in the April 19, 2005

[3] The portions of the Site referenced in this Paragraph are described in the ROD, Appendix A to the Consent Decree (Appendix 1 to this Modification) at PDF pages 103-09.

Alternate Concentration Limits Groundwater Monitoring Work Plan at one or more western groundwater plume Point of Compliance wells (as described in Section II.c of the SOW), which in turn, triggered the requirement to develop and implement a Contingent Remedial Action Plan as defined in the Consent Decree. In 2009, EPA issued an Explanation of Significant Differences ("ESD") to the ROD in which it determined that hazardous substance concentrations in groundwater exceeded the trigger levels. In the ESD, EPA required the installation of a groundwater extraction and treatment system.

E. The United States alleges that Bosch has failed to comply with the requirements of the Consent Decree in the manner and for the reasons set forth in Paragraphs F-L below. In entering into this Modification, Bosch does not admit to the allegations set forth in this Modification, nor does it admit to any liability to the United States arising out of the transactions or occurrences alleged in this Modification.

F. Paragraph 6 of the Consent Decree requires that Bosch "shall finance and perform the Work in accordance with this Consent Decree, the ROD, the SOW, and work plans and other plans, and schedules set forth herein, or developed by [Bosch] and approved by EPA pursuant to this Consent Decree." Consent Decree at ¶ 6. The ROD identifies maintenance of the cover system that existed at the time EPA issued the ROD (which consisted of asphalt, concrete slabs, and then-existing buildings), as a necessary component of the remedy designed to minimize the infiltration of precipitation into the subsurface, and thus minimize the migration of volatile organic compounds into groundwater and prevent direct human contact with contaminated soils. Consent Decree, Appendix 1 at PDF pages 104, 129.

G. Paragraph 26.b of the Consent Decree further requires Bosch to "refrain from

using such property, in any manner that would interfere with or adversely affect the integrity or protectiveness of the remedial measures to be implemented pursuant to this Consent Decree." Appendix 1 at ¶ 26(b).

H. The United States alleges that between April 1, 2008, and June 26, 2008, Bosch destroyed approximately 90 percent of a protective cover, in violation of Paragraphs 6 and 26.b of the Consent Decree.

I. Paragraph 16 of the Consent Decree requires Bosch to provide EPA with prior written notice before shipping Remediation Waste to an off-Site out-of-state waste management facility, unless the total volume of all such shipments does not exceed 10 cubic yards. The United States alleges that Bosch violated this requirement when it shipped the following material off-Site during the demolition of the foundry and maintenance building in 2008 without providing EPA with prior written notice: seventeen 55-gallon drums of liquid hazardous waste; 106,260 pounds of polychlorinated biphenyls ("PCBs") solid waste; 4,400 pounds of PCE impacted with trace PCBs; 4,400 pounds of liquid waste that included kerosene, gasoline, diesel fuel and triethylamine; 24 cylinders of compressed gas and similar materials; and 3,290 cubic yards of soil impacted with trichloroethylene (TCE) at the former foundry maintenance building.

J. Paragraph 26.c. of the Consent Decree required Bosch to submit to EPA for its review and approval a draft easement for the Site no later than November 19, 1999, substantially in the form of the Environmental Protection Easement and Declaration of Restrictive Covenants, attached to the Consent Decree as Appendix E. The United States alleges that Bosch did not do so until April 25, 2019.

K. Section II.g of the SOW requires Bosch to develop and implement a long-term

monitoring plan ("LTMP") to detail the operation and maintenance activities and evaluate the effectiveness of the remedy with a proposed schedule for submitting the LTMP to be included in a draft Remedial Design/Remedial Action ("RD/RA") Work Plan. Bosch submitted the RD/RA Work Plan as required under Section III of the SOW by February 4, 2004, but the United States alleges that Bosch failed to timely submit a LTMP until October 29, 2021.

L. The United States also believes that on two occasions, Bosch replaced its Project Coordinator without giving prior notice to the United States as required in Paragraph 43 of the Consent Decree.

M. The United States alleges that Bosch is liable for stipulated penalties under Section XX of the Consent Decree and/or civil penalties under CERCLA Section 122(l), 42 U.S.C. § 9622(l), for some or all of the alleged Consent Decree violations described above.

N. Paragraph 55 of the Consent Decree requires Bosch to pay the United States' Future Response Costs as defined in the Consent Decree. However, Paragraph 55 limits Bosch's liability for payment of Oversight Costs, defined in the Consent Decree as a subset of Future Response Costs, to $130,000 for the first year following entry of the Consent Decree, $90,000 per year for each of the next four years following entry of the Consent Decree and $25,000 per year for each year thereafter. Paragraph 55 states, however, that "[t]hese limitations shall be re-negotiated in the event that any Contingent Remedial Action is triggered." Consent Decree, Appendix 1 at ¶ 55.

O. The Contingent Remedial Action was triggered in 2009 with EPA's issuance of the ESD. Since that time the United States claims that its Oversight Costs incurred have exceeded the $25,000 annual limitation on Bosch's liability for such costs. As set forth herein,

the Parties agree that Bosch shall pay $764,484.64, in reimbursement for Oversight Costs incurred by the United States from October 1, 2019, through October 31, 2023. Bosch will reimburse EPA for Future Response Costs incurred by the United States after October 31, 2023, not inconsistent with the NCP. There will be no further dollar amount limitations on Bosch's liability for Oversight Costs or Future Response Costs.

P. The Consent Decree does not contain a specific provision detailing requirements to modify the Decree. However, Paragraph 111 of the Consent Decree states: "Nothing in this Decree shall be deemed to alter the Court's power to enforce, supervise or approve modifications to this Consent Decree." Consent Decree, Appendix 1, ¶ 111. The Parties agree to this proposed Modification and the Court possesses the inherent power to modify a consent decree when the parties have agreed to such a modification. *Vanguards of Cleveland v. City of Cleveland*, 23 F.3d 1013, 1018 (6th Cir. 1994).

Q. If for any reason the Court should decline to approve this Modification in the form presented, this agreement, except for ¶ R and ¶ S, is voidable at the sole discretion of any Party and its terms may not be used as evidence in any litigation between the Parties.

R. This Modification will be lodged with the Court for at least 30 days for public notice and comment in accordance with Section 122(d)(2) of CERCLA, 42 U.S.C. § 9622(d)(2), and 28 C.F.R. § 50.7. Notwithstanding that Bosch has already implemented some of the changes reflected in this Modification, the United States may withdraw or withhold its consent if the comments regarding the Modification disclose facts or considerations that indicate that the Modification is inappropriate, improper, or inadequate.

S. Bosch agrees not to oppose or appeal the entry of this Modification.

T. The Consent Decree, as amended by this Modification, shall remain in full force and effect in accordance with its terms except as specifically provided in this Modification.

NOW THEREFORE, before the taking of any further testimony and without further adjudication of any issue of fact or law, and upon the consent and agreement of the Parties, it is hereby ORDERED, JUDGED, and DECREED as follows:

1. Terms defined in the Consent Decree apply to this Modification unless otherwise provided in this Modification.

2. Paragraph 4 of the Consent Decree shall be modified to include the following additional definitions located in alphabetical order of the defined terms:

> "Date of Lodging of the First Modification" means the date that the Modification is first lodged with the court.
>
> "Fund" means the Hazardous Substance Superfund established under Section 9507 of the Internal Revenue Code, 26 U.S.C. § 9507.
>
> "Modification" or "this Modification" means the First Modification to Consent Decree.
>
> "Special Account" means the special account, within the Fund, established for the Site by EPA under Section 122(b)(3) of CERCLA.

3. The definition of "Settling Defendant" in Paragraph 4 of the Consent Decree shall be replaced with the following definition:

> "Settling Defendant" shall mean Robert Bosch LLC.

4. Paragraph 55 of the Consent Decree is replaced with the following language:

> Except as otherwise provided herein, Settling Defendant shall reimburse the EPA Hazardous Substance Superfund for all Future Response Costs incurred by the United States after October 1, 2019, not inconsistent with the NCP, as follows.

a. Within 60 Days after Court entry of the Modification, Settling Defendant shall pay EPA $764,484.64 in reimbursement of Oversight Costs paid by the United States from October 1, 2019, through October 31, 2023, and Settling Defendant shall not have any other liability for Oversight Costs incurred by the United States from date of entry of the Consent Decree through October 31, 2023.

b. Thereafter, Settling Defendant shall reimburse EPA for all Future Response Costs paid by the United States on or after November 1, 2023. On a periodic basis, EPA will send Settling Defendant a bill for Future Response Costs paid by the United States starting November 1, 2023. The bill shall include an Itemized Cost Summary listing direct and indirect costs paid by EPA, its contractors, subcontractors, and the Department of Justice. Settling Defendant shall make all payments required by this Paragraph within 90 days of Settling Defendant's receipt of each bill, except as otherwise provided in Paragraph 56.

c. Settling Defendant shall make the above required payment at https://www.pay.gov using the "EPA Miscellaneous Payments Cincinnati Finance Center" link, and including references to the Site/Spill ID #05A5, the Department of Justice case number 90-11-2-06028, and the purpose of the payment. Settling Defendant shall send notices of this payment to the United States and EPA.

d. EPA may, in its unreviewable discretion, deposit the amounts paid under this Paragraph in the Fund, in the Special Account, or both. EPA may, in its unreviewable discretion, retain and use any amounts deposited in the Special Account to conduct or finance response actions at or in connection with the Site, or transfer those amounts to the Fund.

5. Paragraph 83a shall be added after Paragraph 83 and shall state:

The Modification resolves Settling Defendant's liability for payment of Future Response Costs and Oversight Costs paid by EPA through October 31, 2023. The Modification also resolves Settling Defendant's liability for stipulated penalties under the Consent Decree and civil penalties under Section 122(l) of CERCLA, 42 U.S.C. § 9622(l), for the following alleged violations of the Consent Decree that occurred before the Date of Lodging of the First Modification.

a. Destruction of the cover system above the Eastern Plume source area (which consisted of existing asphalt, concrete slab, and buildings) from April 1, 2008, to June 26, 2008, which the United States alleges was removal of a protective cover and in violation of Paragraphs 6 and 26.b. of the

Consent Decree.

b. Off-site disposal of waste without prior notice to EPA beginning from April 1, 2008, to June 30, 2008, which EPA alleges was in violation of Paragraph 16 of the Consent Decree.

c. Failure to submit draft institutional controls to EPA as required by Paragraph 26.c of the Consent Decree, from November 19, 1999, until its submission of a draft Environmental Restrictive Covenant on April 25, 2019.

d. Failure to submit a LTMP as required by Section II.g of the SOW, from February 4, 2004, until its submission on October 29, 2021.

e. Any and all failures to submit timely or complete monthly and annual reports, which may have occurred from time to time from June 14, 1999, to the Date of Lodging of the First Modification, in violation of Paragraph 31 of the Consent Decree.

f. Any and all failures to submit or resubmit to EPA Certificates of Insurance, copies of insurance policies, or evidence of financial assurance, which may have occurred from time to time prior to the Date of Lodging of this Modification, as required by Paragraphs 46 through 49 and 60 of the Consent Decree.

g. Any and all failures to notify EPA of changes in the staffing of Settling Defendant's Project Coordinator by providing information about the successor Project Coordinator, which may have occurred from time to time prior to the Date of Lodging of the First Modification, as required by Paragraph 43 of the Consent Decree.

6. Paragraph 104 of the Consent Decree is modified so that written notice is instead required to be provided to the following individuals at the following addresses:

As to DOJ: *via email to*:
eescdcopy.enrd@usdoj.gov
Re: DJ # 90-11-2-06028

As to EPA: *via email to*:
harris.michael@epa.gov
and
kelly.joseph@epa.gov
Re: Site/Spill ID # 05AS

As to Settling Defendant:

Director, Environmental, Health and Safety
Corporate Office of Sustainability and EHS matters in the NA Region (C/SER-NA)
Robert Bosch LLC
38000 Hills Tech Drive
Farmington Hills, MI 48331

And

Legal Services - Region North America
(C/LSR-NA2)
Robert Bosch LLC
38000 Hills Tech Drive
Farmington Hills, MI 48331

7. Paragraph 109 of the Consent Decree is replaced with the following language:

> Except as provided in Paragraphs 18 and 20-21 and Section XI (EPA Approval of Plans and Other Submissions) of the Decree, nonmaterial modifications to Sections I through XXXIII and the Appendices must be in writing and are effective when signed (including electronically signed) by the Parties. Material modifications to Sections I through XXXIII and the Appendices must be in writing, signed (which may include electronically signed) by the Parties, and are effective upon approval by the Court. As to changes to the remedy, a modification to the Decree, including the SOW, to implement an amendment to the Record of Decision that "fundamentally alters the basic features" of

the Remedial Action within the meaning of 40 C.F.R. § 300.435(c)(2)(ii) will be considered a material modification.

This Modification to the Consent Decree is ENTERED and APPROVED this _____ day of _____, 2026.

_____

[Name of Judge]
United States District Judge
Western District of Michigan

FOR THE UNITED STATES OF AMERICA:

ADAM R.F. GUSTAFSON
Principal Deputy Assistant Attorney General
Environment and Natural Resources Division
U.S. Department of Justice

May 12, 2026
Date

s/ Brian Schaap
STEVEN D. ELLIS
Senior Counsel
BRIAN SCHAAP
Trial Attorney
Environmental Enforcement Section
Environment and Natural Resources Division
U.S. Department of Justice
Washington, DC 20044-7611

FOR THE U.S. ENVIRONMENTAL PROTECTION AGENCY:

THOMAS SHORT Digitally signed by THOMAS SHORT
Date: 2026.01.08 13:32:09 -06'00'

Date

MICHAEL D. HARRIS
Director, Superfund & Emergency Management Division, Region 5
U.S. Environmental Protection Agency

FOR ROBERT BOSCH LLC:

Paul_Thomas

Digitally signed by Paul_Thomas
DN: dc=com, dc=group-pki, o=BOSCH, ou=tsp1fh, cn=Paul_Thomas
Date: 2025.10.31 11:18:04 -04'00'

Date

PAUL THOMAS
President, Robert Bosch LLC

Daniela_Beloiu

Digitally signed by Daniela_Beloiu
Date: 2025.10.28 17:42:03 -04'00'

Date

DANIELA BELOIU
Vice President, Robert Bosch LLC

IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF MICHIGAN

UNITED STATES OF AMERICA,	)	
	)	
Plaintiff,	)	
	)	
v.	)	No. 1:99-CV-414
	)	
ROBERT BOSCH LLC,	)	
	)	
Defendant.	)	

APPENDIX 1 TO
FIRST MODIFICATION TO CONSENT DECREE

ORIGINAL CONSENT DECREE AND PORTION OF APPENDIX A TO ORIGINAL CONSENT DECREE

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IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF MICHIGAN

UNITED STATES OF AMERICA

Plaintiff,

v.

ROBERT BOSCH CORPORATION,

Defendant.

CIVIL ACTION NO. 1:99-CV-414

Douglas W. Hillman
Senior, U.S. District Judge

CONSENT DECREE

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IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF MICHIGAN

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CONSENT DECREE

BACKGROUND

A. The United States of America ("United States"), on behalf of the Administrator of the United States Environmental Protection Agency ("EPA"), filed a complaint in this matter pursuant to Sections 106 and 107 of the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA"), 42 U.S.C. §§ 9606, 9607.

B. The United States in its complaint seeks, inter alia: (1) reimbursement of costs incurred by EPA and the Department of Justice for response actions at the Bendix/Bosch Braking Systems Superfund Site in St. Joseph, Michigan, together with accrued interest; and (2) performance of studies and response work by the defendants at the Site consistent with the National Contingency Plan, 40 C.F.R. Part 300 (as amended) ("NCP").

C. In accordance with the NCP and Section 121(f)(1)(F) of

CERCLA, 42 U.S.C. § 9621(f)(1)(F), EPA notified the State of Michigan (the "State") on July 27, 1998, of negotiations with potentially responsible parties regarding the implementation of the remedial design and remedial action for the Site, and EPA has provided the State with an opportunity to participate in such negotiations and be a party to this Consent Decree.

D. In accordance with Section 122(j)(1) of CERCLA, 42 U.S.C. § 9622(j)(1), EPA notified the United States Fish and Wildlife Service on July 27, 1998, of negotiations with potentially responsible parties regarding the release of hazardous substances that may have resulted in injury to the natural resources under Federal trusteeship and encouraged the trustee to participate in the negotiation of this Consent Decree.

E. The defendant that has entered into this Consent Decree ("Settling Defendant") does not admit any liability to the Plaintiffs arising out of the transactions or occurrences alleged in the complaint, nor does it acknowledge that the release or threatened release of hazardous substances at or from the Site constitutes an imminent or substantial endangerment to the public health or welfare or the environment.

F. Pursuant to Section 105 of CERCLA, 42 U.S.C. § 9605, EPA placed the Site on the National Priorities List, set forth at 40 C.F.R. Part 300, Appendix B, by publication in the Federal Register on February 15, 1990.

G. In response to a release or a substantial threat of a release of a hazardous substances at or from the Site, the Site owner at the time, AlliedSignal, Inc., commenced in February 1989, a Remedial Investigation and Feasibility Study ("RI/FS") for the Site pursuant to 40 C.F.R. § 300.430 under the terms of an Administrative Order by Consent re: Remedial Investigation and Feasibility Study, U.S. EPA Docket No. V-W-89-C-003 (2/13/89).

H. After purchasing the Site from AlliedSignal, Inc. in 1996, the Settling Defendant completed a Remedial Investigation ("RI") Report on July 1, 1997, and the Settling Defendant completed a Feasibility Study ("FS") Report on July 1, 1997. The RI and FS were reviewed and approved by the EPA and State, and were determined to be consistent with the NCP. Bosch or it predecessor-in-interest with regard to the Site has reimbursed all Past Response Costs invoiced by EPA with regard to the Site through February 13, 1998.

I. Pursuant to Section 117 of CERCLA, 42 U.S.C. § 9617, EPA published notice of the completion of the FS and of the proposed plan for remedial action on August 12, 1997, in a major local newspaper of general circulation. EPA provided an opportunity for written and oral comments from the public on the proposed plan for remedial action. A copy of the transcript of the public meeting is available to the public as part of the administrative record upon which the Regional Administrator based the selection of the response action.

J. The decision by EPA on the remedial action to be implemented

at the Site is embodied in a final Record of Decision ("ROD"), executed on September 30, 1997, on which the State has given its concurrence. The ROD includes a responsiveness summary to the public comments. Notice of the final plan was published in accordance with Section 117(b) of CERCLA. The ROD selected a remedy that is protective of human health and the environment in that it requires restoration of groundwater to Drinking Water Standards (MCLs), or a cumulative excess cancer risk below 10E-4 and a cumulative Hazard Index below 1.0, throughout the groundwater plumes.

K. Based on the information presently available to EPA and the State, EPA and the State believe that the Work will be properly and promptly conducted by the Settling Defendant if conducted in accordance with the requirements of this Consent Decree and its appendices.

L. Solely for the purposes of Section 113(j) of CERCLA, the Remedial Action selected by the ROD and the Work to be performed by the Settling Defendant shall constitute a response action taken or ordered by the President.

M. The Parties recognize, and the Court by entering this Consent Decree finds, that this Consent Decree has been negotiated by the Parties in good faith and implementation of this Consent Decree will expedite the cleanup of the Site and will avoid prolonged and complicated litigation between the Parties, and that this Consent Decree is fair, reasonable, and in the public interest.

NOW, THEREFORE, it is hereby Ordered, Adjudged, and Decreed:

II. JURISDICTION

1. This Court has jurisdiction over the subject matter of this action pursuant to 28 U.S.C. §§ 1331 and 1345, and 42 U.S.C. §§ 9606, 9607, and 9613(b). This Court also has personal jurisdiction over the Settling Defendant. Solely for the purposes of this Consent Decree and the underlying complaint, Settling Defendant waives all objections and defenses that it may have to jurisdiction of the Court or to venue in this District. Settling Defendant shall not challenge the terms of this Consent Decree or this Court's jurisdiction to enter and enforce this Consent Decree.

III. PARTIES BOUND

2. This Consent Decree applies to and is binding upon the United States and the State and upon Settling Defendant and its successors and assigns. Except as otherwise provided in this Consent Decree or as agreed by the Parties in writing, any change in ownership or corporate status of a Settling Defendant including, but not limited to, any transfer of assets or real or personal property, shall in no way alter such Settling Defendant's responsibilities under this Consent Decree.

3. Settling Defendant shall provide a copy of this Consent Decree to each contractor hired to perform the Work (as defined below)

required by this Consent Decree and to each person representing the Settling Defendant with respect to the Site or the Work and shall condition all contracts entered into hereunder upon performance of the Work in conformity with the terms of this Consent Decree. Settling Defendant or its contractors shall provide written notice of the Consent Decree to all subcontractors hired to perform any portion of the Work required by this Consent Decree. Settling Defendant shall nonetheless be responsible for ensuring that its contractors and subcontractors perform the Work contemplated herein in accordance with this Consent Decree. With regard to the activities undertaken pursuant to this Consent Decree, each contractor and subcontractor shall be deemed to be in a contractual relationship with the Settling Defendant within the meaning of Section 107(b)(3) of CERCLA, 42 U.S.C. § 9607(b)(3).

IV. DEFINITIONS

4. Unless otherwise expressly provided herein, terms used in this Consent Decree which are defined in CERCLA or in regulations promulgated under CERCLA shall have the meaning assigned to them in CERCLA or in such regulations. Whenever terms listed below are used in this Consent Decree or in the appendices attached hereto and incorporated hereunder, the following definitions shall apply:

"CERCLA" shall mean the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, 42 U.S.C.

§§ 9601 et seq.

"Contingent Remedial Action" shall mean those actions, except for Operation and Maintenance, to be undertaken by the Settling Defendant to implement the Contingent Remedial Action Plan developed by Settling Defendant and approved by EPA (after review and comment by the State) pursuant to Paragraph 14.

"Consent Decree" shall mean this Decree and all appendices attached hereto (listed in Section XXIX). In the event of conflict between this Decree and any appendix, this Decree shall control.

"Day" shall mean a calendar day unless expressly stated to be a working day. "Working day" shall mean a day other than a Saturday, Sunday, or Federal holiday. In computing any period of time under this Consent Decree, where the last day would fall on a Saturday, Sunday, or Federal holiday, the period shall run until the close of business of the next working day.

"EPA" shall mean the United States Environmental Protection Agency and any successor departments or agencies of the United States.

"MDEQ" shall mean the Michigan Department of Environmental Quality and any successor departments or agencies of the State.

"Future Response Costs" shall mean all costs, including, but not limited to, direct and indirect costs, that the United States incurs following entry of this Consent Decree in reviewing or developing plans, reports and other items pursuant to this Consent Decree, verifying the Work, or otherwise implementing, overseeing, or

enforcing this Consent Decree, including, but not limited to, payroll costs, contractor costs, travel costs, laboratory costs, the costs incurred pursuant to Sections VII, IX (including, but not limited to, attorneys fees and any monies paid to secure access and/or to secure institutional controls, including the amount of just compensation), XV, and Paragraph 88 of Section XXI. Future Response Costs includes, but is not limited to, Oversight Costs.

"Interest," shall mean interest at the rate specified for interest on investments of the Hazardous Substance Superfund established under Subchapter A of Chapter 98 of Title 26 of the U.S. Code, compounded on October 1 of each year, in accordance with 42 U.S.C. § 9607(a).

"National Contingency Plan" or "NCP" shall mean the National Oil and Hazardous Substances Pollution Contingency Plan promulgated pursuant to Section 105 of CERCLA, 42 U.S.C. § 9605, codified at 40 C.F.R. Part 300, and any amendments thereto.

"Operation and Maintenance" or "O & M" shall mean all activities required to maintain the effectiveness of the Remedial Action as required under the Operation and Maintenance Plan approved or developed by EPA pursuant to this Consent Decree and the Statement of Work (SOW).

"Oversight Costs" shall mean that subset of Future Response Costs incurred by the United States in the process of reviewing, commenting upon, amending, observing, approving and verifying activities performed as part of the Remedial Design, Remedial Action, Operation

and Maintenance and any Contingent Remedial Action. Such costs shall not include Past Response Costs or those costs incurred by EPA pursuant to Paragraphs 28, 52 or 88.

"Paragraph" shall mean a portion of this Consent Decree identified by an Arabic numeral or an upper case letter.

"Parties" shall mean the United States and the Settling Defendant.

"Past Response Costs" shall mean all costs, including, but not limited to, direct and indirect costs, that the United States paid at or in connection with the Site through the date of entry of the Consent Decree.

Performance Standards" shall mean the standards and other measures of achievement of the goals of the Remedial Action, set forth in Section X of the ROD and defined in the SOW.

"Plaintiff" shall mean the United States.

"RCRA" shall mean the Solid Waste Disposal Act, as amended, 42 U.S.C. §§ 6901 et seq. (also known as the Resource Conservation and Recovery Act).

"Record of Decision" or "ROD" shall mean the EPA Record of Decision relating to the Site signed on September 30, 1997, by the Regional Administrator, EPA Region V, or his delegate, and all attachments thereto. The ROD is attached as Appendix A.

"Remedial Action" shall mean those activities, except for Operation and Maintenance, to be undertaken by the Settling Defendant to implement the scope of the remedy selected in the ROD, in

accordance with the SOW and the final Remedial Design/Remedial Action Work Plan and other plans approved by EPA. Remedial Action does not include Contingent Remedial Action. "Remedial Design" shall mean those activities to be undertaken by the Settling Defendant to develop the final plans and specifications for the Remedial Action pursuant to the Remedial Design/Remedial Action Work Plan.

"Remedial Design/Remedial Action Work Plan" shall mean the document developed pursuant to Paragraph 11 of this Consent Decree and approved by EPA, and any amendments thereto.

"Remediation Waste" shall mean wastes generated in connection with the work required pursuant to this Consent Decree.

"Section" shall mean a portion of this Consent Decree identified by a roman numeral.

"Settling Defendant" shall mean Robert Bosch Corporation.

"Site" shall mean the Bendix/Bosch Braking Systems Superfund Site, depicted generally on the map attached as Appendix B encompassing the property located at 3737 Red Arrow Highway, St. Joseph, Berrien County, Michigan (approximately 37 acres) and the groundwater contaminated by sources located at this address.

"State" shall mean the State of Michigan.

"Statement of Work" or "SOW" shall mean the statement of work for implementation of the Remedial Design, Remedial Action, and Operation and Maintenance at the Site, as set forth in Appendix B to this Consent Decree and any modifications made in accordance with this

Consent Decree.

"Supervising Contractor" shall mean the principal contractor retained by the Settling Defendant to supervise and direct the implementation of the Work under this Consent Decree.

"United States" shall mean the United States of America.

"Waste Material" shall mean (1) any "hazardous substance" under Section 101(14) of CERCLA, 42 U.S.C. § 9601(14); (2) any pollutant or contaminant under Section 101(33), 42 U.S.C. § 9601(33); (3) any "solid waste" under Section 1004(27) of RCRA, 42 U.S.C. § 6903(27); and (4) any "hazardous substance" under Michigan Comp. Laws § 324.20101(1)(t).

"Work" shall mean all activities Settling Defendant is required to perform under this Consent Decree, except those required by Section XXV (Retention of Records).

V. GENERAL PROVISIONS

5. Objectives of the Parties

The objectives of the Parties in entering into this Consent Decree are to protect public health or welfare or the environment at the Site by the design and implementation of response actions at the Site by the Settling Defendant, to reimburse response costs of EPA and to resolve the claims of Plaintiff against Settling Defendant as provided in this Consent Decree.

6. Commitments by Settling Defendant

Settling Defendant shall finance and perform the Work in accordance with this Consent Decree, the ROD, the SOW, and work plans and other plans, and schedules set forth herein or developed by Settling Defendant and approved by EPA pursuant to this Consent Decree. Settling Defendant shall also reimburse the United States for Past Response Costs and Future Response Costs as provided in this Consent Decree.

7. Compliance With Applicable Law

All activities undertaken by Settling Defendant pursuant to this Consent Decree shall be performed in accordance with the requirements of all applicable federal and state laws and regulations. Settling Defendant must also comply with all applicable or relevant and appropriate requirements of all Federal and state environmental laws as set forth in the ROD and the SOW. The activities conducted pursuant to this Consent Decree, if approved by EPA, shall be considered to be consistent with the NCP.

8. Permits

a. As provided in Section 121(e) of CERCLA and Section 300.400(e) of the NCP, no permit shall be required for any portion of the Work conducted entirely on-Site (i.e., within the areal extent of contamination or in very close proximity to the contamination and necessary for implementation of the Work). Where any portion of the Work that is not on-Site requires a federal or state permit or approval, Settling Defendant shall submit timely and complete

applications and take all other actions necessary to obtain all such permits or approvals.

b. The Settling Defendant may seek relief under the provisions of Section XVIII (Force Majeure) of this Consent Decree for any delay in the performance of the Work resulting from a failure to obtain, or a delay in obtaining, any permit required for the Work.

c. This Consent Decree is not, and shall not be construed to be, a permit issued pursuant to any federal or state statute or regulation.

9. Notice of Obligations to Successors-in-Title

a. With respect to any property owned or controlled by the Settling Defendant that is located within the Site, within 30 days after the entry of this Consent Decree, the Owner Settling Defendant shall file a notice to be recorded with the Recorder's Office of Berrien County, State of Michigan, which shall provide notice to all successors-in-title that such property is part of the Site, that EPA selected a remedy for the Site on September 30, 1997, and that Settling Defendant has entered into a Consent Decree requiring implementation of the remedy. Such notice shall identify the United States District Court in which the Consent Decree was filed, the name and civil action number of this case, and the date the Consent Decree was entered by the Court and shall be in a form substantially similar to Appendix D. The Settling Defendant shall provide EPA a copy of the notice within 10 days of its submittal to the Berrien County

Recorder's Office. The Settling Defendant shall provide EPA with a certified copy of the recorded notice(s) within 10 days of its receipt of such notice.

b. At least 30 days prior to the proposed conveyance by Settling Defendant of any fee or leasehold interest in property it owns that is located within the Site, the Settling Defendant proposing to convey the interest shall give the proposed grantee written notice of (i) this Consent Decree, (ii) any instrument by which an interest in real property has been conveyed that confers a right of access to the Site (hereinafter referred to as "Access Easements") pursuant to Section IX (Access and Institutional Controls), and (iii) any instrument by which an interest in real property has been conveyed that confers a right to enforce restrictions on the use of such property (hereinafter referred to as "Restrictive Easements") pursuant to Section IX (Access and Institutional Controls). At least 20 days prior to such proposed conveyance, the Settling Defendant conveying the interest shall also give written notice to EPA and the State of the proposed conveyance, including the name and address of the proposed grantee, and the date on which notice of the Consent Decree, Access Easements, and/or Restrictive Easements was given to the proposed grantee. Such notice to EPA and the State may be identified by Settling Defendant as confidential business information(CBI). EPA shall make a CBI determination in accordance with CERCLA and Agency regulations.

c. In the event of any such conveyance, the Settling Defendant's obligations under this Consent Decree, including, but not limited to, its obligation to provide or secure access shall continue to be met by the Settling Defendant to the extent practicable. In no event shall the conveyance release or otherwise affect the liability of the Settling Defendant to comply with all provisions of this Consent Decree, absent the prior written consent of EPA, which consent shall not be unreasonably withheld. If the United States approves, the grantee may perform some or all of the Work under this Consent Decree.

VI. PERFORMANCE OF THE WORK BY SETTLING DEFENDANT

10. Selection of Supervising Contractor.

a. All aspects of the Work to be performed by Settling Defendant pursuant to Sections VI (Performance of the Work by Settling Defendant), VII (Remedy Review), VIII (Quality Assurance, Sampling and Data Analysis), and XV (Emergency Response) of this Consent Decree shall be under the direction and supervision of the Supervising Contractor, the selection of which shall be subject to disapproval by EPA. No later than 10 days after the lodging of this Consent Decree, Settling Defendant shall notify EPA in writing of the name, title, and qualifications of any contractor proposed to be the Supervising Contractor. EPA will issue a notice of disapproval or an authorization to proceed. If at any time thereafter, Settling

Defendant proposes to change a Supervising Contractor, Settling Defendant shall give such notice to EPA and must obtain an authorization to proceed from EPA before the new Supervising Contractor performs, directs, or supervises any Work under this Consent Decree.

b. If EPA disapproves a proposed Supervising Contractor, EPA shall notify Settling Defendant in writing. Defendant shall submit to EPA a list of contractors, including the qualifications of each contractor, that would be acceptable to them within 30 days of receipt of EPA's disapproval of the contractor previously proposed. EPA will provide written notice of the names of any contractor(s) that it disapproves and an authorization to proceed with respect to any of the other contractors. Settling Defendant may select any contractor from that list that is not disapproved and shall notify EPA of the name of the contractor selected within 21 days of EPA's authorization to proceed.

c. If EPA fails to provide written notice of its authorization to proceed or disapproval as provided in this Paragraph and this failure prevents the Settling Defendant from meeting one or more deadlines in a plan approved by the EPA pursuant to this Consent Decree, Settling Defendant may seek relief under the provisions of Section XVIII (Force Majeure) hereof.

11. Remedial Design/Remedial Action.

a. Within 60 days after entry of the Consent Decree, pursuant to

Section IV of the SOW, Settling Defendant shall submit to EPA and the State a work plan for the design and implementation of the Remedial Action at the Site ("Remedial Design/Remedial Action Work Plan" or "RD/RA Work Plan"). The Remedial Design/Remedial Action Work Plan shall provide for design of the remedy set forth in the ROD, in accordance with the SOW and for achievement of the Performance Standards and other requirements set forth in this Consent Decree. Upon its approval by EPA, the Remedial Design/Remedial Action Work Plan shall be incorporated into and become enforceable under this Consent Decree. The Settling Defendant shall submit to EPA a Health and Safety Plan for field design activities and field activities which conforms to the applicable Occupational Safety and Health Administration and EPA requirements including, but not limited to, 29 C.F.R. § 1910.120 pursuant to the schedule in the SOW.

b. The Remedial Design/Remedial Action Work Plan shall include plans and schedules for implementation of all Remedial Design, pre-design and Remedial Action tasks identified in the SOW, including, but not limited to, plans, schedules and methodologies for the completion of: (1) pre-design sampling and analysis plan (including, but not limited to, a Quality Assurance Project Plan (QAPP) in accordance with Section IV of the SOW (Quality Assurance Project Plan); (2) an SVE treatability study; (3) a Pre-design Work Plan; (4) Preliminary (30% to 60%) SVE Design submittal; (5) Pre-final (90%-95%) SVE Design submittal; (6) a Final SVE Design

submittal; (7) a Construction Quality Assurance Plan; (8) selection of the contractor; (9) developing and submitting other required remedial action plans; (10) a groundwater monitoring plan; (11) satisfying permitting requirements; (12) implementation of the SVE Operation and Maintenance Plan; (13) preparation of the Contingency Plan; and (14) decontamination of equipment and the disposal of contaminated materials. The Remedial Design/Remedial Action work plan also shall include a schedule for implementation of all Remedial Action tasks identified in the final design submittal and shall identify the Settling Defendant's Remedial Action project team (including, but not limited to, the supervising contractor).

c. Upon approval of the Remedial Design/Remedial Action Work Plan by EPA, Settling Defendant shall implement the Remedial Design/Remedial Action Work Plan. The Settling Defendant shall submit to EPA and the state all plans, submittals and other deliverables required under the approved Remedial Design/Remedial Action Work Plan in accordance with the approved schedule for review and approval pursuant to Section XI (EPA Approval of Plans and Other Submissions). Unless otherwise directed by EPA, Settling Defendant shall not commence further Remedial Design activities at the Site prior to approval of the Remedial Design/Remedial Action Work Plan.

d. The preliminary (30% to 60%) SVE design submittal shall be consistent with Section III, Task 4 of the SOW.

e. The pre-final (95%) and final (100%) SVE design submittal

shall be consistent with Section III, Task 4 of the SOW. The CQAP, which shall detail the approach to quality assurance during construction activities at the Site, shall specify a quality assurance official ("QA Official") as required by Section IV.E. of the SOW.

12. The Settling Defendant shall continue to implement the Remedial Action, or the Contingent Remedial Action, and O&M until the Performance Standards are achieved and for so long thereafter as is otherwise required under this Consent Decree.

13. Modification of the SOW or Related Work Plans.

a. If EPA determines that modification to the work specified in the SOW and/or in work plans developed pursuant to the SOW is necessary to achieve and maintain the Performance Standards or to carry out and maintain the effectiveness of the remedy selected in the ROD, EPA may require that such modification be incorporated in the SOW and/or such work plans. Provided, however, that a modification may only be required pursuant to this Paragraph to the extent that it is consistent with the scope of the remedy selected in the ROD.

b. For the purposes of this Paragraph 13 and Paragraphs 50 and 51 only, the scope of "the remedy selected in the ROD" is: groundwater institutional controls and deed restrictions, soil vapor extraction (eastern plume loading dock vadose zone source), natural attenuation (western plume) monitoring (eastern and western plumes),

and preparation of the Contingency Plan. For purposes of this Paragraph 13, the scope of the remedy selected in the ROD shall not include implementation of the Contingency Plan.

c. If Settling Defendant objects to any modification determined by EPA to be necessary pursuant to this Paragraph, they may seek dispute resolution pursuant to Section XIX (Dispute Resolution), Paragraph 68 (record review). The SOW and/or related work plans (including the schedule) shall be modified in accordance with final resolution of the dispute.

d. Settling Defendant shall implement any work required by any modifications incorporated in the SOW and/or in work plans developed pursuant to the SOW in accordance with this Paragraph.

e. Nothing in this Paragraph shall be construed to limit EPA's authority to require performance of further response actions as otherwise provided in this Consent Decree.

14. Contingency Plan Procedures and Implementation

a. Following completion of the Baseline Groundwater Data Collection Program (BGWDCP) required in the SOW, and after review and comment by the State, EPA shall establish Point of Compliance (POC) criteria in the form of Alternate Concentration Levels (ACLs). With respect to any POC criteria, the Parties shall discuss the specific methodology to be used to calculate the POC Criteria. If no agreement is reached with respect to the methodology to be used, the United States shall determine the methodology to be used. Settling

Defendant may invoke Dispute Resolution with respect to any such Determination. If EPA determines pursuant to Section II.e. of the SOW that monitoring has predicted or detected exceedences of the POC criteria, or if, prior to the establishment of POC criteria, the findings of the Lake Study required by Section II. b. 7. of the SOW show ecological risks under current conditions, Settling Defendant shall propose a Contingent Remedial Action Plan within 90 days of EPA's notice of such exceedences or findings of ecological risk. The Contingent Remedial Action Plan shall include one or more measures outlined in the Contingency Plan including, but not limited to, increased groundwater monitoring, statistical analysis of existing and new data, sampling of surface water bodies, the implementation of one of the groundwater control measures identified in the Feasibility Study, groundwater bioventing or biosparging, enhanced biodegradation of plume contaminants, in-well stripping, a combination of these procedures or other suitable action approved by EPA.

b. If EPA determines that modification to the Contingent Remedial Action Plan is necessary to achieve and maintain the Performance Standards, EPA may require that such modification be incorporated in the Contingent Remedial Action Plan. If Settling Defendant objects to any modification determined by EPA to be necessary pursuant to this Paragraph, they may seek dispute resolution pursuant to Section XIX (Dispute Resolution), Paragraph 68 (record review). The Contingent Remedial Action Plan and/or related

work plans and schedules shall be modified in accordance with final resolution of the dispute.

c. If EPA determines after review and comment by the State, that the proposed Contingent Remedial Action Plan is appropriate and meets the Purposes of the SOW, EPA may require that such plan be implemented pursuant to the work plans and schedule required in the Contingent Remedial Action Plan.

d. Nothing in this Paragraph shall be construed to limit EPA's authority to require performance of further response actions as provided in Paragraph 20 of this Consent Decree.

15. Settling Defendant acknowledges and agrees that nothing in this Consent Decree, the SOW, or the Remedial Design or Remedial Action Work Plans constitutes a warranty or representation of any kind by Plaintiffs that compliance with the work requirements set forth in the SOW and the Work Plans will achieve the Performance Standards.

16. The Remedial Action does not contemplate off-Site shipment of Remediation Waste from the Site. However, in the event that the Work does require such shipment, Settling Defendant shall, prior to any off-Site shipment of Remediation Waste from the Site to an out-of-state waste management facility, provide written notification to the appropriate state environmental official in the receiving facility's state and to the EPA Project Coordinator of such shipment of Remediation Waste. However, this notification requirement shall

not apply to any off-Site shipments when the total volume of all such shipments will not exceed 10 cubic yards.

a. The Settling Defendant shall include in the written notification the following information, where available: (1) the name and location of the facility to which the Waste Material are to be shipped; (2) the type and quantity of the Waste Material to be shipped; (3) the expected schedule for the shipment of the Waste Material; and (4) the method of transportation. The Settling Defendant shall notify the state in which the planned receiving facility is located of major changes in the shipment plan, such as a decision to ship the Waste Material to another facility within the same state, or to a facility in another state.

b. The identity of the receiving facility and state will be determined by the Settling Defendant following the award of the contract for Remedial Action construction. The Settling Defendant shall provide the information required by Paragraph 16.a as soon as practicable after the award of the contract and before the Remediation Waste is actually shipped.

VII. REMEDY REVIEW

17. Periodic Review. Settling Defendant shall conduct such studies and investigations as requested by EPA, in order to permit EPA to conduct reviews of whether the Remedial Action is protective of human health and the environment at least every five years as

required by Section 121(c) of CERCLA and any applicable regulations.

18. EPA Selection of Further Response Actions. If EPA determines, at any time, that the Remedial Action or any Contingent Remedial Action is not protective of human health and the environment EPA may select further response actions for the Site in accordance with the requirements of CERCLA and the NCP.

19. Opportunity To Comment. Settling Defendant and, if required by Sections 113(k)(2) or 117 of CERCLA, the public, will be provided with an opportunity to comment on any further response actions proposed by EPA as a result of the review conducted pursuant to Section 121(c) of CERCLA and to submit written comments for the record during the comment period.

20. Settling Defendant's Obligation To Perform Further Response Actions. If EPA selects further response actions for the Site pursuant to Paragraph 18, the Settling Defendant shall undertake such further response actions to the extent that the reopener conditions in Paragraph 84 or Paragraph 85 (United States' reservations of liability based on unknown conditions or new information) are satisfied. Settling Defendant may invoke the procedures set forth in Section XIX (Dispute Resolution) to dispute (1) EPA's determination that the reopener conditions of Paragraph 84 or Paragraph 85 of Section XXI (Covenants Not To Sue by Plaintiffs) are satisfied, (2) EPA's determination that the Remedial Action and any Contingent Remedial Action that has been or may be implemented pursuant to

Paragraph 14 is not protective of human health and the environment, or (3) EPA's selection of the further response actions. Disputes pertaining to whether the Remedial Action or Contingent Remedial Action is protective or to EPA's selection of further response actions shall be resolved pursuant to Paragraph 68 (record review).

21. Submissions of Plans. If Settling Defendant is required to perform the further response actions pursuant to Paragraph 20, it shall submit a plan for such work to EPA for approval in accordance with the procedures set forth in Section XI. (EPA Approval of Plans and Other Submissions and shall implement the plan approved by EPA in accordance with the provisions of this Decree.

VIII. QUALITY ASSURANCE, SAMPLING, and DATA ANALYSIS

22. Settling Defendant shall use quality assurance, quality control, and chain of custody procedures for all treatability, design, compliance and monitoring samples in accordance with "EPA Requirements for Quality Assurance Project Plans for Environmental Data Operation," (EPA QA/R5; "Preparing Perfect Project Plans," (EPA /600/9-88/087), and subsequent amendments to such guidelines upon notification by EPA to Settling Defendant of such amendment. Amended guidelines shall apply only to procedures conducted after such notification. Prior to the commencement of any monitoring project under this Consent Decree, Settling Defendant shall submit to EPA for approval after a reasonable opportunity for review and

comment by the State, a Quality Assurance Project Plan ("QAPP") that is consistent with the SOW, the NCP and applicable guidance documents identified in the SOW. If relevant to the proceeding, the Parties agree that validated sampling data generated in accordance with the QAPP(s) and reviewed and approved by EPA shall be admissible as evidence, without objection, in any proceeding under this Decree. Settling Defendant shall ensure that EPA personnel and its authorized representatives are allowed access at reasonable times to all laboratories utilized by Settling Defendant in implementing this Consent Decree. In addition, Settling Defendant shall ensure that such laboratories shall analyze all samples submitted by EPA pursuant to the QAPP for quality assurance monitoring. Settling Defendant shall ensure that the laboratories they utilize for the analysis of samples taken pursuant to this Decree perform analyses according to accepted EPA analytical methods. Accepted EPA analytical methods consist of those methods which are documented in the "Contract Lab Program Statement of Work for Inorganic Analysis" and the "Contract Lab Program Statement of Work for Organic Analysis," dated February 1988, and any amendments made thereto during the course of the implementation of this Decree. Settling Defendant shall ensure that laboratories they use for analysis of samples taken pursuant to this Consent Decree participate in an EPA or EPA-equivalent QA/QC program. Settling Defendant shall ensure that field methodologies utilized in collecting samples for subsequent analysis pursuant to this Decree

will be conducted in accordance with the procedures set forth in the QAPP approved by EPA.

23. Upon request, the Settling Defendant shall allow split or duplicate samples to be taken by EPA or its authorized representatives. Settling Defendant shall notify EPA not less than 7 days in advance of any sample collection activity under this Consent Decree unless shorter notice is agreed to by EPA. Such notification can be completed pursuant to Paragraph 31(d). In addition, EPA shall have the right to take any additional samples that EPA deems necessary. Upon request, EPA shall allow the Settling Defendant to take split or duplicate samples of any samples it takes as part of the Plaintiff's oversight of the Settling Defendant's implementation of the Work.

24. Settling Defendant shall submit to EPA and the State two copies each of summaries of the results of sampling and/or tests or other data required to be obtained or generated by or on behalf of Settling Defendant with respect to the SOW and/or the implementation of this Consent Decree unless EPA agrees otherwise.

25. Notwithstanding any provision of this Consent Decree, the United States hereby retains all of its information gathering and inspection authorities and rights, including enforcement actions related thereto, under CERCLA, RCRA and any other applicable statutes or regulations.

IX. ACCESS AND INSTITUTIONAL CONTROLS

26. If the Site or any other property where access and/or land/water use restrictions are needed to implement this Consent Decree is owned or controlled by Settling Defendant, Settling Defendant shall:

a. commencing on the date of entry of this Consent Decree, provide the United States, the State and their representatives, including EPA and its contractors, with access at all reasonable times to such property, for the purpose of conducting any activity related to this Consent Decree including, but not limited to, the following activities:

i. Monitoring the Work;

ii. Verifying any data or information submitted to the United States;

iii. Conducting investigations relating to contamination at or near the Site;

iv. Obtaining samples;

v. Assessing the need for, planning, or implementing additional response actions at or near the Site;

vi. Implementing the Work pursuant to the conditions set forth in Paragraph 87 of this Consent Decree;

vii. Inspecting and copying records, operating logs, contracts, or other documents maintained or

generated by Settling Defendant or its agents, consistent with Section XXIV (Access to Information); and

viii. Assessing Settling Defendant's compliance with this Consent Decree.

b. commencing on the date of entry of this Consent Decree, refrain from using such property, in any manner that would interfere with or adversely affect the integrity or protectiveness of the remedial measures to be implemented pursuant to this Consent Decree. Such restrictions include, but are not limited to, use of groundwater; and

c. within 45 days of entry of this Consent Decree, submit to E P A for review and approval with respect to such propertya draft easement, in substantially the form attached hereto as Appendix E; and (i) within 15 days of EPA's approval and acceptance of the easement, Settling Defendant shall record the easement with the Recorder's Office of Berrien County; and (ii) within 30 days of recording the easement, such Settling Defendant shall provide EPA with a certified copy of the original recorded easement showing the clerk's recording stamps.

27. For property owned or controlled by persons other than the Settling Defendant where access and/or land/water use restrictions currently are needed to implement this Consent Decree, Settling Defendant has obtained access agreements from all such persons for

all such properties, a copy of which agreements have been provided to EPA and a list of which are attached hereto as Appendix F. Settling Defendant has also obtained restrictive covenants from substantially all such persons regarding substantially all such properties, which restrictive covenants are enforceable by the State of Michigan. A copy of such restrictive covenants for such properties has been provided to EPA by Settling Defendant, and a list of such restrictive covenants is attached hereto as Appendix G. A copy of the documents listed in Appendices F or G also are included in the Site file located at the St. Joseph Public Library. The Berrien County, Michigan Private and Type III Public Groundwater Supply Ordinance ("Ordinance") provides additional institutional control restrictions over use of the groundwater on all other properties in the vicinity of the Site. However, in the event that additional property where access and/or land/water use restrictions are needed to implement this Consent Decree, Settling Defendant shall use Best Efforts to secure from such persons:

a. an agreement to provide access thereto for Settling Defendant, as well as for the United States on behalf of EPA, as well as its designated representatives (including contractors), for the purpose of conducting any activity related to this Consent Decree including, but not limited to, those activities listed in Paragraph 26(a) of this Consent Decree;

b. an agreement, enforceable by the Settling Defendant and

the United States, to refrain from using such property in any manner that would interfere with or adversely affect the integrity or effectiveness of the remedial measures to be undertaken pursuant to this Consent Decree or that are otherwise necessary to implement, or ensure non-interference with, or ensure the protectiveness of the remedial measures to be implemented pursuant to this Consent Decree; and

c. within 45 days of determining that such additional property and/or land/water use restrictions are needed to implement this Consent Decree, Settling Defendant shall submit to EPA for review and approval with respect to such property a draft license that is enforceable under the laws of the State of Michigan, free and clear of all prior liens and encumbrances (except as approved by EPA), and acceptable under the Attorney General's Title Regulations promulgated pursuant to 40 U.S.C. § 255. Within 15 days of EPA's approval and acceptance of the license, Settling Defendant shall record the license with the Recorder's Office of Berrien County. Within 30 days of the recording of the license, Settling Defendant shall provide EPA with a certified copy of the original recorded license showing the clerk's recording stamps.

28. For purposes of Paragraph 27 of this Consent Decree, "Best Efforts" includes the payment of reasonable sums of money in consideration of access, access easements, land/water use

restrictions, and/or restrictive easements up to a maximum aggregate total of $25,000. If any access or land/water use restriction agreements required by Paragraphs 27(a) or 27(b) of this Consent Decree are not obtained within 120 days of the date EPA determines that such additional access and/or land/water restrictions are needed to implement this Consent Decree Settling Defendant shall promptly notify the United States in writing, and shall include in that notification a summary of the steps that Settling Defendant has taken to attempt to comply with Paragraph 27 of this Consent Decree. The United States may, as it deems appropriate, assist Settling Defendant in obtaining access or land/water use restrictions, either in the form of contractual agreements or in the form of easements running with the land. Settling Defendant shall reimburse the United States in accordance with the procedures in Section XVI (Reimbursement of Response Costs), for all costs incurred, direct or indirect, by the United States in obtaining such access and/or land/water use restrictions including, but not limited to, the cost of attorney time and the amount of monetary consideration paid.

29. The Berrien County, Michigan Private and Type III Public Groundwater Supply Ordinance ("Ordinance") requires, among other things, a license from the Berrien County Health Department for installation of groundwater use wells, thereby restricting use of groundwater under or adjacent to the Site. In the event that the Ordinance is proposed to be amended, modified or rescinded, Settling

Defendant shall notify EPA and the State of such proposed amendment, modification or rescission within fourteen (14) days of receipt by Settling Defendant of actual notice of such proposed action. If EPA determines that additional land/water use restrictions in the form of state or local laws, regulations, ordinances or other governmental controls are needed to implement the remedy selected in the ROD, ensure the integrity and protectiveness thereof, or ensure non-interference therewith, Settling Defendant shall cooperate with EPA's efforts to secure such governmental controls.

30. Notwithstanding any provision of this Consent Decree, the United States retain all of their access authorities and rights, as well as all of their rights to require land/water use restrictions, including enforcement authorities related thereto, under CERCLA, RCRA and any other applicable statute or regulations.

X. REPORTING REQUIREMENTS

31. In addition to any other requirement of this Consent Decree, Settling Defendant shall submit to EPA and the State 2 copies each of written monthly progress reports that: (a) describe the actions which have been taken toward achieving compliance with this Consent Decree during the previous month; (b) include a summary of the results of sampling and tests and all other data received or generated by Settling Defendant or its contractors or agents pursuant to this Consent Decree in the previous month; (c) identify all work plans,

plans and other deliverables required by this Consent Decree completed and submitted during the previous month; (d) describe actions, including, but not limited to, sample collection and implementation of work plans, which are scheduled for the next six weeks and provide other information relating to the progress of construction; (e) include information regarding percentage of completion, unresolved delays encountered or anticipated that may affect the future schedule for implementation of the Work, and a description of efforts made to mitigate those delays or anticipated delays; (f) include any modifications to the work plans or other schedules that Settling Defendant has proposed to EPA or that have been approved by EPA; and (g) describe activities undertaken in support of the Community Relations Plan during the previous month and those to be undertaken in the next six weeks. Settling Defendant shall submit these progress reports to EPA and the State by the tenth day of every month following the lodging of this Consent Decree until EPA notifies the Settling Defendant pursuant to Paragraph 51.b of Section XIV (Certification of Completion). If requested by EPA, Settling Defendant shall also provide briefings for EPA to discuss the progress of the Work.

32. The Settling Defendant shall notify EPA of any change in the schedule described in the monthly progress report for the performance of any activity, including, but not limited to, data collection and implementation of work plans, no later than seven days prior to the

performance of the activity.

33. Upon the occurrence of any event during performance of the Work that Settling Defendant is required to report pursuant to Section 103 of CERCLA or Section 304 of the Emergency Planning and Community Right-to-know Act (EPCRA), Settling Defendant shall within 24 hours of the onset of such event orally notify the EPA Project Coordinator or the Alternate EPA Project Coordinator (in the event of the unavailability of the EPA Project Coordinator), or, in the event that neither the EPA Project Coordinator or Alternate EPA Project Coordinator is available, the Emergency Response Section, Region V, United States Environmental Protection Agency. These reporting requirements are in addition to the reporting required by CERCLA Section 103 or EPCRA Section 304.

34. Within 20 days of the onset of such an event, Settling Defendant shall furnish to Plaintiff a written report, signed by the Settling Defendant's Project Coordinator, setting forth the events which occurred and the measures taken, and to be taken, in response thereto. Within 30 days of the conclusion of such an event, Settling Defendant shall submit a report setting forth all actions taken in response thereto.

35. Settling Defendant shall submit two (2)copies of all drafts and three (3) copies of all final plans, reports, and data required by the SOW, the Remedial Design/Remedial Action Work Plan, or any other approved plans to EPA in accordance with the schedules set

forth in such plans. Settling Defendant shall simultaneously submit two (2) copies of all drafts and two (2) copies of all final versions of such plans, reports and data to the State.

36. All reports and other documents submitted by Settling Defendant to EPA (other than the monthly progress reports referred to above) which purport to document Settling Defendant's compliance with the terms of this Consent Decree shall be signed by an authorized representative of the Settling Defendant.

XI. EPA APPROVAL OF PLANS AND OTHER SUBMISSIONS

37. After review of any plan, report or other item which is required to be submitted for approval pursuant to this Consent Decree, EPA, after reasonable opportunity for review and comment by the State, shall: (a) approve, in whole or in part, the submission; (b) approve the submission upon specified conditions; (c) modify the submission to cure the deficiencies; (d) disapprove, in whole or in part, the submission, directing that the Settling Defendant modify the submission; or (e) any combination of the above. However, EPA shall not modify a submission without first providing Settling Defendant at least one notice of deficiency and an opportunity to cure within 14 days, except where to do so would cause serious disruption to the Work or where previous submission(s) have been disapproved due to material defects (and such material defects were not cured in a timely fashion) and the deficiencies in the submission

under consideration indicate a bad faith lack of effort to submit an acceptable deliverable.

38. In the event of approval, approval upon conditions, or modification by EPA, pursuant to Paragraph 37(a), (b), or (c), Settling Defendant shall proceed to take any action required by the plan, report, or other item, as approved or modified by EPA subject only to their right to invoke the Dispute Resolution procedures set forth in Section XIX (Dispute Resolution) with respect to the modifications or conditions made by EPA. In the event that EPA modifies the submission to cure the deficiencies pursuant to Paragraph 37(c) and the submission has a material defect, EPA retains its right to seek stipulated penalties, as provided in Section XX (Stipulated Penalties).

a. Upon receipt of a notice of disapproval pursuant to Paragraph 37(d), Settling Defendant shall, within 14 days or such longer time as specified by EPA in such notice, correct the deficiencies and resubmit the plan, report, or other item for approval. Any stipulated penalties applicable to the submission, as provided in Section XX, shall accrue during the 14-day period or otherwise specified period but shall not be payable unless the resubmission is disapproved or modified due to a material defect as provided in Paragraphs 37 and 38.

b. Notwithstanding the receipt of a notice of disapproval pursuant to Paragraph 37(d), Settling Defendant shall proceed, at the

direction of EPA, to take any action required by any non-deficient portion of the submission. Implementation of any non-deficient portion of a submission shall not relieve Settling Defendant of any liability for stipulated penalties under Section XX (Stipulated Penalties).

40. In the event that a resubmitted plan, report or other item, or portion thereof, is disapproved by EPA, EPA may again require the Settling Defendant to correct the deficiencies, in accordance with the preceding Paragraphs. EPA also retains the right to modify or develop the plan, report or other item. Settling Defendant shall implement any such plan, report, or item as modified or developed by EPA, subject only to their right to invoke the procedures set forth in Section XIX (Dispute Resolution).

41. If upon resubmission, a plan, report, or item is disapproved or modified by EPA due to a material defect, Settling Defendant shall be deemed to have failed to submit such plan, report, or item timely and adequately unless the Settling Defendant invokes the dispute resolution procedures set forth in Section XIX (Dispute Resolution) and EPA's action is overturned pursuant to that Section. The provisions of Section XIX (Dispute Resolution) and Section XX (Stipulated Penalties) shall govern the implementation of the Work and accrual and payment of any stipulated penalties during Dispute Resolution. If EPA's disapproval or modification is upheld, stipulated penalties shall accrue for such violation from the date on

which the initial submission was originally required, as provided in Section XX.

42. All plans, reports, and other items required to be submitted to EPA under this Consent Decree shall, upon approval or modification by EPA , be enforceable under this Consent Decree. In the event EPA approves or modifies a portion of a plan, report, or other item required to be submitted to EPA under this Consent Decree, the approved or modified portion shall be enforceable under this Consent Decree.

XII. PROJECT COORDINATORS

43. Within 20 days of lodging this Consent Decree, Settling Defendant and EPA will notify each other, in writing, of the name, address and telephone number of their respective designated Project Coordinators and Alternate Project Coordinators. If a Project Coordinator or Alternate Project Coordinator initially designated is changed, the identity of the successor will be given to the other Parties at least 5 working days before the changes occur, unless impracticable, but in no event later than the actual day the change is made. The Settling Defendant's Project Coordinator shall be subject to disapproval by EPA and shall have the technical expertise sufficient to adequately oversee all aspects of the Work. The Settling Defendant's Project Coordinator shall not be an attorney for the Settling Defendant in this matter. He or she may assign other

representatives, including other contractors, to serve as a Site representative for oversight of performance of daily operations during remedial activities.

44. EPA shall identify its RD/RA oversight contractor to Settling Defendant within 14 days of lodging of the Consent Decree. The performance of EPA's oversight contractor shall be reviewed by EPA annually, prior to the end of each Federal Fiscal Year, after consultation with Settling Defendant. Plaintiff may designate other representatives, including, but not limited to, EPA employees, and federal contractors and consultants, to observe and monitor the progress of any activity undertaken pursuant to this Consent Decree. EPA's Project Coordinator and Alternate Project Coordinator shall have the authority lawfully vested in a Remedial Project Manager (RPM) and an On-Scene Coordinator (OSC) by the National Contingency Plan, 40 C.F.R. Part 300. In addition, EPA's Project Coordinator or Alternate Project Coordinator shall have authority, consistent with the National Contingency Plan, to halt any Work required by this Consent Decree and to take any necessary response action when s/he determines that conditions at the Site constitute an emergency situation or may present an immediate threat to public health or welfare or the environment due to release or threatened release of Waste Material.

45. EPA's Project Coordinator and the Settling Defendant's Project Coordinator will meet on a periodic basis at such frequency

as the EPA Project Coordinator determines to be necessary.

XIII. ASSURANCE OF ABILITY TO COMPLETE WORK

46. Within 30 days of entry of this Consent Decree, Settling Defendant shall establish and maintain financial security in the amount of $4,168,000 in one or more of the following forms:

(a) A surety bond guaranteeing performance of the Work;

(b) One or more irrevocable letters of credit equaling the total estimated cost of the Work;

(c) A trust fund;

(d) A guarantee to perform the Work by one or more parent corporations or subsidiaries, or by one or more unrelated corporations that have a substantial business relationship with the Settling Defendant; or

(e) A demonstration that the Settling Defendant satisfies the requirements of 40 C.F.R. Part 264.143(f);

47. If the Settling Defendant seeks to demonstrate the ability to complete the Work through a guarantee by a third party pursuant to Paragraph 46(d) of this Consent Decree, Settling Defendant shall demonstrate that the guarantor satisfies the requirements of 40 C.F.R. Part 264.143(f). If Settling Defendant seeks to demonstrate their ability to complete the Work by means of the financial test or the corporate guarantee pursuant to Paragraph 46(d) or (e), it shall resubmit sworn statements conveying the information required by 40

C.F.R. Part 264.143(f) annually, on the anniversary of the effective date of this Consent Decree. In the event that EPA determines at any time that the financial assurances provided pursuant to this Section are inadequate, Settling Defendant shall, within 30 days of receipt of notice of EPA's determination, obtain and present to EPA for approval one of the other forms of financial assurance listed in Paragraph 46 of this Consent Decree. Settling Defendant's inability to demonstrate financial ability to complete the Work shall not excuse performance of any activities required under this Consent Decree.

48. If Settling Defendant can show that the estimated cost to complete the remaining Work has diminished below the amount set forth in Paragraph 46 above after entry of this Consent Decree, Settling Defendant may, on any anniversary date of entry of this Consent Decree, or at any other time agreed to by the Parties, reduce the amount of the financial security provided under this Section to the estimated cost of the remaining work to be performed. Settling Defendant shall submit a proposal for such reduction to EPA, in accordance with the requirements of this Section, and may reduce the amount of the security upon approval by EPA. In the event of a dispute, Settling Defendant may reduce the amount of the security in accordance with the final administrative or judicial decision resolving the dispute.

49. Settling Defendant may change the form of financial assurance

provided under this Section at any time, upon notice to and approval by EPA, provided that the new form of assurance meets the requirements of this Section. In the event of a dispute, Settling Defendant may change the form of the financial assurance only in accordance with the final administrative or judicial decision resolving the dispute.

XIV. CERTIFICATION OF COMPLETION

50. Completion of the Remedial Action/Contingent Remedial Action

a. Within 90 days after Settling Defendant concludes that the Remedial Action (or Contingent Remedial Action if such has been triggered) has been fully performed and the Performance Standards have been attained, Settling Defendant shall schedule and conduct a pre-certification inspection to be attended by Settling Defendant and EPA. If, after the pre-certification inspection, the Settling Defendant still believes that the Remedial Action (or Contingent Remedial Action) has been fully performed and the Performance Standards have been attained, it shall submit a written report requesting certification to EPA for approval pursuant to Section XI (EPA Approval of Plans and Other Submissions) within 30 days of the inspection. In the report, a registered professional engineer and the Settling Defendant Project Coordinator shall state that the Remedial Action (or Contingent Remedial Action) has been completed in full satisfaction of the requirements of this Consent Decree. The

written report shall include as-built drawings signed and stamped by a professional engineer. The report shall contain the following statement, signed by a responsible corporate official of a Settling Defendant or the Settling Defendant's Project Coordinator:

> "To the best of my knowledge, after thorough investigation, I certify that the information contained in or accompanying this submission is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

If after completion of the pre-certification inspection and receipt and review of the written report, EPA after reasonable opportunity to review and comment by the State, determines that the Remedial Action (or Contingent Remedial Action) or any portion thereof has not been completed in accordance with this Consent Decree or that the Performance Standards have not been achieved, EPA will notify Settling Defendant in writing of the activities that must be undertaken by Settling Defendant pursuant to this Consent Decree to complete the Remedial Action (or Contingent Remedial Action) and to achieve the Performance Standards. Provided, however, that EPA may only require Settling Defendant to perform such activities pursuant to this Paragraph (i) with regard to the Remedial Action, to the extent that such activities are consistent with the "scope of the remedy selected in the ROD," as that term is defined in Paragraph 13;

(ii) with regard to the Contingent Remedial Action, to the extent such activities are consistent with the Contingent Remedial Action Plan developed pursuant to Paragraph 14.a. EPA will set forth in the notice a schedule for performance of such activities consistent with the Consent Decree and the SOW or require the Settling Defendant to submit a schedule to EPA for approval pursuant to Section XI (EPA Approval of Plans and Other Submissions). Settling Defendant shall perform all activities described in the notice in accordance with the specifications and schedules established pursuant to this Paragraph, subject to their right to invoke the dispute resolution procedures set forth in Section XIX (Dispute Resolution).

b. If EPA concludes, based on the initial or any subsequent report requesting Certification of Completion and after a reasonable opportunity for review and comment by the State, that the Remedial Action (or Contingent Remedial Action) has been performed in accordance with this Consent Decree and that the Performance Standards have been achieved, EPA will so certify in writing to Settling Defendant. This certification shall constitute the Certification of Completion of the Remedial Action for purposes of this Consent Decree, including, but not limited to, Section XXI (Covenants Not to Sue by Plaintiffs). Certification of Completion of the Remedial Action shall not affect Settling Defendant's obligations under this Consent Decree.

51. Completion of the Work

a. Within 90 days after Settling Defendant concludes that all phases of the Work (including O & M), have been fully performed, Settling Defendant shall schedule and conduct a pre-certification inspection to be attended by Settling Defendant and EPA. If, after the pre-certification inspection, the Settling Defendant still believes that the Work has been fully performed, Settling Defendant shall submit a written report by a registered professional engineer stating that the Work has been completed in full satisfaction of the requirements of this Consent Decree. The report shall contain the following statement, signed by a responsible corporate official of Settling Defendant or the Settling Defendant's Project Coordinator:

> "To the best of my knowledge, after thorough investigation, I certify that the information contained in or accompanying this submission is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

If, after review of the written report, EPA, after reasonable opportunity to review and comment by the State, determines that any portion of the Work has not been completed in accordance with this Consent Decree, EPA will notify Settling Defendant in writing of the activities that must be undertaken by Settling Defendant pursuant to this Consent Decree to complete the Work. Provided, however, that EPA may only require Settling Defendant to perform such activities

pursuant to this Paragraph to the extent that such activities are consistent with the "scope of the remedy selected in the ROD," as that term is defined in Paragraph 13.b., or with the Contingent Remedial Action Plan developed pursuant to Paragraph 14.a. EPA will set forth in the notice a schedule for performance of such activities consistent with the Consent Decree and the SOW or require the Settling Defendant to submit a schedule to EPA for approval pursuant to Section XI (EPA Approval of Plans and Other Submissions). Settling Defendant shall perform all activities described in the notice in accordance with the specifications and schedules established therein, subject to its right to invoke the dispute resolution procedures set forth in Section XIX (Dispute Resolution).

b. If EPA concludes, based on the initial or any subsequent request for Certification of Completion by Settling Defendant and after a reasonable opportunity for review by the State, that the Work has been performed in accordance with this Consent Decree, EPA will so notify the Settling Defendant in writing.

XV. EMERGENCY RESPONSE

52. In the event of any action or occurrence during the performance of the Work which causes or threatens a release of Waste Material from the Site that constitutes an emergency situation or may present an immediate threat to public health or welfare or the

environment, Settling Defendant shall, subject to Paragraph 53, immediately take all appropriate action to prevent, abate, or minimize such release or threat of release, and shall immediately notify the EPA's Project Coordinator, or, if the Project Coordinator is unavailable, EPA's Alternate Project Coordinator. If neither of these persons is available, the Settling Defendant shall notify the EPA Emergency Response Unit, Region V. Settling Defendant shall take such actions in consultation with EPA's Project Coordinator or other available authorized EPA officer and in accordance with all applicable provisions of the Health and Safety Plans, the Contingency Plans, the SOW, any other applicable plans or documents developed pursuant to the SOW, and this Consent Decree. In the event that Settling Defendant fails to take appropriate response action as required by this Section, and EPA takes such action instead, Settling Defendant shall reimburse EPA all costs of the response action not inconsistent with the NCP pursuant to Section XVI (Reimbursement of Response Costs).

53. Nothing in the preceding Paragraph or in this Consent Decree shall be deemed to limit any authority of the United States, a) to take all appropriate action to protect human health and the environment or to prevent, abate, respond to, or minimize an actual or threatened release of Waste Material on, at, or from the Site, or b) to direct or order such action, or seek an order from the Court, to protect human health and the environment or to prevent, abate,

respond to, or minimize an actual or threatened release of Waste Material on, at, or from the Site, subject to Section XXI (Covenants Not to Sue by Plaintiffs).

XVI. REIMBURSEMENT OF RESPONSE COSTS

54. a. EPA shall send to Settling Defendant an invoice of its Past Response Costs incurred through the date of entry of this Consent Decree.

b. Within 45 days of receipt of EPA's Past Response Costs invoice, Settling Defendant shall pay to the EPA Hazardous Substance Superfund the amount stated in the invoice in reimbursement of Past Response Costs, by FedWire Electronic Funds Transfer ("EFT" or wire transfer) to the U.S. Department of Justice account in accordance with current electronic funds transfer procedures, referencing U.S.A.O. file number , the EPA Region and Site/Spill ID #05AS, and DOJ case number 90-11-2-06028. Payment shall be made in accordance with instructions provided to the Settling Defendant by the Financial Litigation Unit of the United States Attorney's Office for the District of Western District of Michigan following lodging of the Consent Decree. Any payments received by the Department of Justice after 4:00 P.M. (Eastern Time) will be credited on the next business day. Settling Defendant shall send notice that such payment has been made to the United States as specified in Section XXVI (Notices and Submissions) and Howard M. Levin. Chief, Program

Accounting and Analysis Section, United States Environmental Protection Agency, Region 5, Mail Code MF-10J, 77 W. Jackson Blvd., Chicago, Illinois 60604.

55. Except as otherwise provided herein, Settling Defendant shall reimburse the EPA Hazardous Substance Superfund for all Future Response Costs not inconsistent with the National Contingency Plan. Reimbursement for Oversight Costs with respect to Remedial Design, Remedial Action, and Operation and Maintenance shall be limited to one hundred thirty thousand dollars ($130,000) for the first year following entry of the Consent Decree, ninety thousand dollars ($90,000) per year for each of the next four years following entry of the Consent Decree and twenty-five thousand dollars ($25,000) per year for each year thereafter. These limitations shall be re-negotiated in the event that any Contingent Remedial Action is triggered. The United States will send Settling Defendant a bill requiring payment that includes an Itemized Cost Summary on an annual basis. Settling Defendant shall make all payments within 30 days of Settling Defendant's receipt of each bill requiring payment, except as otherwise provided in Paragraph 56. The Settling Defendant shall make all payments required by this Paragraph in the form of a certified or cashier's check or checks made payable to "EPA Hazardous Substance Superfund" and referencing the EPA Region and Site/Spill ID #05AS, the DOJ case number 90-11-2-06028, and the name and address of the party making payment. The Settling Defendant shall forward the

certified check(s) to U.S. EPA Region V, Attention: Superfund Accounting, P. O. Box 70753, Chicago, Illinois 60673, and shall send copies of the check(s) to the United States as specified in Section XXVII (Notices and Submissions).

56. Settling Defendant may contest payment of any Past or Future Response Costs under Paragraphs 54 or 55 if it determines that the United States has made an accounting error or if it alleges that a cost item that is included represents costs that are inconsistent with the NCP. Such objection shall be made in writing within 90 days of receipt of the bill and must be sent to the United States (if the United States' accounting is being disputed) pursuant to Section XXVI (Notices and Submissions). Any such objection shall specifically identify the contested Future Response Costs and the basis for objection. In the event of an objection, the Settling Defendant shall within the 90 day period pay all uncontested Future Response Costs to the United States in the manner described in Paragraph 55. Simultaneously, the Settling Defendant shall establish an interest-bearing escrow account in a federally-insured bank duly chartered in the State of Michigan and remit to that escrow account funds equivalent to the amount of the contested Future Response Costs. The Settling Defendant shall send to the United States, as provided in Section XXVI (Notices and Submissions), a copy of the transmittal letter and check paying the uncontested Future Response Costs, and a copy of the correspondence that establishes and funds the escrow

account, including, but not limited to, information containing the identity of the bank and bank account under which the escrow account is established as well as a bank statement showing the initial balance of the escrow account. Simultaneously with establishment of the escrow account, the Settling Defendant shall initiate the Dispute Resolution procedures in Section XIX (Dispute Resolution). If the United States prevails in the dispute, within 5 days of the resolution of the dispute, the Settling Defendant shall pay the sums due (with accrued interest) to the United States in the manner described in Paragraph 55. If the Settling Defendant prevails concerning any aspect of the contested costs, the Settling Defendant shall pay that portion of the costs (plus associated accrued interest) for which it did not prevail to the United States. Settling Defendant shall be disbursed any balance of the escrow account. The dispute resolution procedures set forth in this Paragraph in conjunction with the procedures set forth in Section XIX (Dispute Resolution) shall be the exclusive mechanisms for resolving disputes regarding the Settling Defendant's obligation to reimburse the United States for its Future Response Costs.

57. In the event that the payment required by Paragraph 54 is not made within 30 days of receipt of EPA's Past Response Cost invoice, or the payment required by Paragraph 55 is not made within 90 days of the Settling Defendant's receipt of the bill, Settling Defendant shall pay Interest on the unpaid balance. The Interest to be paid on

Past Response Costs and under this Paragraph shall begin to accrue 90 days after receipt of EPA's Past Response Cost invoice. The Interest on Future Response Costs shall begin to accrue 30 days after Settling Defendant's receipt of the bill. The Interest shall accrue through the date of the Settling Defendant's payment. Payments of Interest made under this Paragraph shall be in addition to such other remedies or sanctions available to Plaintiffs by virtue of Settling Defendant's failure to make timely payments under this Section. The Settling Defendant shall make all payments required by this Paragraph in the manner described in Paragraph 55.

XVII. INDEMNIFICATION AND INSURANCE

58. a. The United States does not assume any liability by entering into this agreement or by virtue of any designation of Settling Defendant as EPA's authorized representatives under Section 104(e) of CERCLA. Settling Defendant shall indemnify, save and hold harmless the United States, and its officials, agents, employees, contractors, subcontractors, or representatives for or from any and all claims or causes of action arising from, or on account of, negligent or other wrongful acts or omissions of Settling Defendant, their officers, directors, employees, agents, contractors, subcontractors, and any persons acting on their behalf or under their control, in carrying out activities pursuant to this Consent Decree, including, but not limited to, any claims arising from any

designation of Settling Defendant as EPA's authorized representatives under Section 104(e) of CERCLA. Further, the Settling Defendant agrees to pay the United States all costs it incurs including, but not limited to, attorneys fees and other expenses of litigation and settlement arising from, or on account of, claims made against the United States based on negligent or other wrongful acts or omissions of Settling Defendant, its officers, directors, employees, agents, contractors, subcontractors, and any persons acting on its behalf or under its control, in carrying out activities pursuant to this Consent Decree. The United States shall not be held out as a party to any contract entered into by or on behalf of Settling Defendant in carrying out activities pursuant to this Consent Decree. Neither the Settling Defendant nor any such contractor shall be considered an agent of the United States.

b. The United States shall give Settling Defendant at least 30 days prior notice of any claim for which the United States plans to seek indemnification pursuant to Paragraph 58.a., and shall consult with Settling Defendant prior to settling such claim.

59. Settling Defendant waives all claims against the United States for damages or reimbursement or for set-off of any payments made or to be made to the United States, arising from or on account of any contract, agreement, or arrangement between Settling Defendant and any person for performance of Work on or relating to the Site, including, but not limited to, claims on account of construction

delays. In addition, Settling Defendant shall indemnify and hold harmless the United States with respect to any and all claims for damages or reimbursement arising from or on account of any contract, agreement, or arrangement between Settling Defendant and any person for performance of Work on or relating to the Site, including, but not limited to, claims on account of construction delays.

60. No later than 15 days before commencing any on-site Work, Settling Defendant shall secure, and shall maintain until the first anniversary of EPA's Certification of Completion of the Remedial Action pursuant to Paragraph 50.b. of Section XIV (Certification of Completion) comprehensive general liability insurance with limits of one million dollars ($1,000,000), combined single limit, and automobile liability insurance with limits of one million dollars ($1,000,000), combined single limit, naming the United States as additional insured. In addition, for the duration of this Consent Decree, Settling Defendant shall satisfy, or shall ensure that their contractors or subcontractors satisfy, all applicable laws and regulations regarding the provision of worker's compensation insurance for all persons performing the Work on behalf of Settling Defendant in furtherance of this Consent Decree. Prior to commencement of the Work under this Consent Decree, Settling Defendant shall provide to EPA certificates of such insurance and a copy of each insurance policy. Settling Defendant shall resubmit such certificates and copies of policies each year on the anniversary

of the effective date of this Consent Decree. If Settling Defendant demonstrates by evidence satisfactory to EPA that any contractor or subcontractor maintains insurance equivalent to that described above, or insurance covering the same risks but in a lesser amount, then, with respect to that contractor or subcontractor, Settling Defendant needs provide only that portion of the insurance described above which is not maintained by the contractor or subcontractor.

XVIII. FORCE MAJEURE

61. "Force majeure," for purposes of this Consent Decree, is defined as any event arising from causes beyond the control of the Settling Defendant, of any entity controlled by Settling Defendant, or of Settling Defendant's contractors, that delays or prevents the performance of any obligation under this Consent Decree despite Settling Defendant's best efforts to fulfill the obligation. The requirement that the Settling Defendant exercise "best efforts to fulfill the obligation" includes using best efforts to anticipate any potential force majeure event and best efforts to address the effects of any potential force majeure event (1) as it is occurring and (2) following the potential force majeure event, such that the delay is minimized to the greatest extent possible. "Force Majeure" does not include financial inability to complete the Work or a failure to attain the Performance Standards.

62. If any event occurs or has occurred that may delay the

performance of any obligation under this Consent Decree, whether or not caused by a force majeure event, the Settling Defendant shall notify orally EPA's Project Coordinator or, in his or her absence, EPA's Alternate Project Coordinator or, in the event both of EPA's designated representatives are unavailable, the Director of the Superfund Division, EPA Region V, within 48 hours of when Settling Defendant first knew that the event might cause a delay. Within 15 days thereafter, Settling Defendant shall provide in writing to EPA and the State an explanation and description of the reasons for the delay; the anticipated duration of the delay; all actions taken or to be taken to prevent or minimize the delay; a schedule for implementation of any measures to be taken to prevent or mitigate the delay or the effect of the delay; the Settling Defendant's rationale for attributing such delay to a force majeure event if they intend to assert such a claim; and a statement as to whether, in the opinion of the Settling Defendant, such event may cause or contribute to an endangerment to public health, welfare or the environment. The Settling Defendant shall include with any notice all available documentation supporting their claim that the delay was attributable to a force majeure. Failure to comply with the above requirements shall preclude Settling Defendant from asserting any claim of force majeure for that event for the period of time of such failure to comply, and for any additional delay caused by such failure. Settling Defendant shall be deemed to know of any circumstance of

which Settling Defendant, any entity controlled by Settling Defendant, or Settling Defendant's contractors knew or should have known.

63. If EPA agrees that the delay or anticipated delay is attributable to a force majeure event, the time for performance of the obligations under this Consent Decree that are affected by the force majeure event will be extended by EPA for such time as is necessary to complete those obligations. An extension of the time for performance of the obligations affected by the force majeure event shall not, of itself, extend the time for performance of any other obligation. If EPA does not agree that the delay or anticipated delay has been or will be caused by a force majeure event, EPA will notify the Settling Defendant in writing of its decision. If EPA agrees that the delay is attributable to a force majeure event, EPA will notify the Settling Defendant in writing of the length of the extension, if any, for performance of the obligations affected by the force majeure event.

64. If the Settling Defendant elects to invoke the dispute resolution procedures set forth in Section XIX (Dispute Resolution) with regard to EPA's force majeure decision in Paragraph 63, it shall do so no later than 15 days after receipt of EPA's notice. In any such proceeding, Settling Defendant shall have the burden of demonstrating by a preponderance of the evidence that the delay or anticipated delay has been or will be caused by a force majeure

event, that the duration of the delay or the extension sought was or will be warranted under the circumstances, that best efforts were exercised to avoid and mitigate the effects of the delay, and that Settling Defendant complied with the requirements of Paragraphs 61 and 62, above. If Settling Defendant carries this burden, the delay at issue shall be deemed not to be a violation by Settling Defendant of the affected obligation of this Consent Decree identified to EPA and the Court.

XIX. DISPUTE RESOLUTION

Unless otherwise expressly provided for in this Consent Decree, the dispute resolution procedures of this Section shall be the exclusive mechanism to resolve disputes arising under or with respect to this Consent Decree. However, the procedures set forth in this Section shall not apply to actions by the United States to enforce obligations of the Settling Defendant that have not been disputed in accordance with this Section.

66. a. Informal dispute resolution period. The Parties to this consent decree shall attempt to resolve expeditiously any disagreements concerning the meaning, application or implementation of this Consent Decree. Any Party seeking dispute resolution first shall provide the other Party with an "informal notice of dispute" in writing and request an informal dispute resolution period, which shall not exceed thirty (30) days.

b. Employment of neutral mediator. Within ten (10) days of the filing of an informal notice of dispute (or in the event of an alleged "force majeure" event, within ten (10) days of EPA's notification of disagreement pursuant to paragraph 63), either the United States or the Settling Defendant may, by providing notice in writing, request the employment of a neutral mediator to be selected in accordance with subparagraph 66(c). The United States and the Settling Defendant agree to fund (on a per capita basis) employment of a neutral mediator pursuant to a negotiated agreement. EPA's share of such funding shall not be considered a Future Response Cost or Oversight Cost. Any mediation shall not last longer than forty-five (45) days from the filing of the informal notice of dispute (expiration of the informal dispute resolution period notwithstanding) or, in the event of an alleged "force majeure" event, forty-five (45) days from EPA's notification of disagreement pursuant to paragraph 61, unless extended by written agreement of the United States and Settling Defendant. Any report, findings, recommendations, written records, or notes prepared by the mediator shall not be binding on any Party and shall not be part of the administrative record or admissible in dispute resolution proceedings pursuant to this Consent Decree or otherwise, or any other legal proceeding. The Director, Superfund Division, Region V, and management for the Settling Defendant shall review any report, findings, or recommendations of the mediator, but the Director may

not consider or rely on such report, findings, or recommendations in issuing a final decision on dispute resolution pursuant to subparagraph 68b or 69a.

c. Selection of neutral mediator roster. Within forty-five (45) days after entry of this Consent Decree, Settling Defendant and the United States shall submit to each other a list of at least three suggested mediators, who shall each have the qualifications of (a) demonstrated experience in the use of alternative dispute resolution, (b) independence, (c) subject matter experience, and (d) lack of actual or apparent bias. A description of the qualifications of a proposed mediator shall accompany the submittal. Settling Defendant and the United States shall, within twenty-one (21) days after receipt of a list of mediators, strike those names to which they will not agree. If necessary, additional names shall be submitted and considered, until a roster of at least two available mediators is agreed upon. If for any reason, at any time, a previously agreed upon mediator is unavailable, then the selection process shall be promptly reinstated so as to have at least two mediators readily available.

d. Appointment of neutral mediator. Upon the timely request of the United States or Settling Defendant for the employment of a neutral mediator in accordance with subparagraph 66.b., a mediator shall be selected at random (e.g., by names being drawn blindly) from the available roster. The United States and Settling Defendant shall expeditiously enter into a written contract with the mediator for the

provision of required services, including salary, terms of payments, each parties share of costs, and a confidentiality agreement. The contract shall include the following provision on confidentiality:

> "In order to promote frank and productive discussion, the mediation process will be confidential. The parties, their representatives, and the mediator may not disclose information regarding the negotiations, including settlement terms, proposals, offers, or other statements made during the mediation process or negotiations, to third parties, unless the United States and Settling Defendant otherwise agree in writing. The mediation process and negotiations shall be treated as compromise negotiations under Rule 408 of the Federal Rules of Evidence or other applicable rules of evidence. The mediator will be disqualified as and shall not appear as a witness, consultant or expert in any pending or future action relating to the subject matter or mediation, including actions between persons not parties to the mediation."

67. a. In the event that the parties cannot resolve a dispute by informal negotiations under the preceding Paragraph, then the position advanced by EPA shall be considered binding unless, within 7 days after the conclusion of the informal negotiation period, Settling Defendant invokes the formal dispute resolution procedures of this Section by serving on the United States a written Statement

of Position on the matter in dispute, including, but not limited to, any factual data, analysis or opinion supporting that position and any supporting documentation relied upon by the Settling Defendant. The Statement of Position shall specify the Settling Defendant's position as to whether formal dispute resolution should proceed under Paragraph 68 or Paragraph 69.

b. Within 14 days after receipt of Settling Defendant's Statement of Position, EPA will serve on Settling Defendant its Statement of Position, including, but not limited to, any factual data, analysis, or opinion supporting that position and all supporting documentation relied upon. EPA's Statement of Position shall include a statement as to whether formal dispute resolution should proceed under Paragraph 68 or 69. Within 14 days after receipt of EPA's Statement of Position, Settling Defendant may submit a Reply.

c. If there is disagreement between EPA and the Settling Defendant as to whether dispute resolution should proceed under Paragraph 68 or 69, the parties to the dispute shall follow the procedures set forth in the paragraph determined by EPA to be applicable. However, if the Settling Defendant ultimately appeals to the Court to resolve the dispute, the Court shall determine which paragraph is applicable in accordance with the standards of applicability set forth in Paragraphs 68 and 69.

68. Formal dispute resolution for disputes pertaining to the

selection or adequacy of any response action and all other disputes that are accorded review on the administrative record under applicable principles of administrative law shall be conducted pursuant to the procedures set forth in this Paragraph. For purposes of this Paragraph, the adequacy of any response action includes, without limitation: (1) the adequacy or appropriateness of plans, procedures to implement plans, or any other items requiring approval by EPA under this Consent Decree; and (2) the adequacy of the performance of response actions taken pursuant to this Consent Decree. Nothing in this Consent Decree shall be construed to allow any dispute by Settling Defendant regarding the validity of the ROD's provisions.

a. An administrative record of the dispute shall be maintained by EPA and shall contain all statements of position, including supporting documentation, submitted pursuant to this Section. Where appropriate, EPA may allow submission of supplemental statements of position by the parties to the dispute.

b. The Director of the Superfund Division, EPA Region V, will expeditiously issue a final administrative decision resolving the dispute based on the administrative record described in Paragraph 68.a This decision shall be binding upon the parties to the dispute, subject only to the right to seek judicial review pursuant to Paragraph 68.c. and d.

c. Any administrative decision made by EPA pursuant to

Paragraph 68.b. shall be reviewable by this Court, provided that a motion for judicial review of the decision is filed by the Settling Defendant with the Court and served on all Parties within 10 days of receipt of EPA's decision. The motion shall include a description of the matter in dispute, the efforts made by the parties to resolve it, the relief requested, and the schedule, if any, within which the dispute must be resolved to ensure orderly implementation of this Consent Decree. The United States may file a response to Settling Defendant's motion.

d. In proceedings on any dispute governed by this Paragraph, Settling Defendant shall have the burden of demonstrating that the decision of the Superfund Division Director is arbitrary and capricious or otherwise not in accordance with law. Judicial review of EPA's decision shall be on the administrative record compiled pursuant to Paragraph 68.a.

69. Formal dispute resolution for disputes that neither pertain to the selection or adequacy of any response action nor are otherwise accorded review on the administrative record under applicable principles of administrative law, shall be governed by this Paragraph.

a. Following receipt of Settling Defendant's Reply submitted pursuant to Paragraph 67, the Director of the Superfund Division, EPA Region V, will issue a final decision resolving the dispute. The Superfund Division Director's decision shall be binding

on the parties to the dispute unless, within 10 days of receipt of the decision, the Settling Defendant files with the Court and serves on the parties to the dispute a motion for judicial review of the decision setting forth the matter in dispute, the efforts made by the parties to resolve it, the relief requested, and the schedule, if any, within which the dispute must be resolved to ensure orderly implementation of the Consent Decree. The United States may file a response to Settling Defendant's motion.

b. Notwithstanding Paragraph M of Section I (Background) of this Consent Decree, judicial review of any dispute governed by this Paragraph shall be governed by applicable principles of law.

70. The invocation of formal dispute resolution procedures under this Section shall not extend, postpone or affect in any way any obligation of the Settling Defendant under this Consent Decree, not directly in dispute, unless EPA or the Court agrees otherwise. Stipulated penalties with respect to the disputed matter shall continue to accrue but payment shall be stayed pending resolution of the dispute as provided in Paragraph 79. Notwithstanding the stay of payment, stipulated penalties shall accrue from the first day of noncompliance with any applicable provision of this Consent Decree. In the event that the Settling Defendant does not prevail on the disputed issue, stipulated penalties shall be assessed and paid as provided in Section XX (Stipulated Penalties).

XX. STIPULATED PENALTIES

71. Settling Defendant shall be liable for stipulated penalties in the amounts set forth in Paragraphs 72, 73 and 74 to the United States for failure to comply with the requirements of this Consent Decree specified below, unless excused under Section XVIII (Force Majeure). "Compliance" by Settling Defendant shall include completion of the activities under this Consent Decree or any work plan or other plan approved under this Consent Decree identified below in accordance with all applicable requirements of law, this Consent Decree, the SOW, and any plans or other documents approved by EPA pursuant to this Consent Decree and within the specified time schedules established by and approved under this Consent Decree.

72. a. The following stipulated penalties shall accrue per violation per day for any noncompliance identified in subparagraph b of this Paragraph 72.:

PENALTY PER VIOLATION PER DAY	PERIOD OF NONCOMPLIANCE
$ 500	Days 1-14
$ 1,000	Days 15-30
$ 2,000	Days 31+

b. Failure to meet the compliance milestones for the following activities, which are set forth in Section V. of the SOW, shall subject Settling Defendant to the stipulated penalties established in subparagraph a of this Paragraph 72:

FINAL RD/RA WORK PLAN
PRE-DESIGN STUDY REPORTS
INSTALL MONITORING WELL SYSTEM
LONG TERM MONITORING PLAN
FINAL BGWDCP REPORT
FINAL SVE DESIGN
INITIATE CONSTRUCTION OF SVE

73. a. The following stipulated penalties shall accrue per violation per day for any noncompliance identified in subparagraph b:

PENALTY PER VIOLATION PER DAY	PERIOD OF NONCOMPLIANCE
$ 250	DAYS 1-14
$ 500	DAYS 15-30
$ 1,000	DAYS 31+

b. Failure to meet the compliance milestones for the following activities, which are set forth in Section V., of the SOW, shall subject Settling Defendant to the stipulated penalties established in subparagraph a of this Paragraph 73:

FINAL QUALITY ASSURANCE PROJECT PLANS
FINAL O&M PLAN
FINAL COMPLETION OF CONSTRUCTION OF SVE REPORT

74. The following stipulated penalties shall be payable per violation per day to the United States for failure to make payments when due or failure to submit timely or adequate monthly progress reports or other written documents pursuant to Section X. (Reporting Requirements) of this Consent Decree or annual SVE, long term monitoring and operation and maintenance reports:

PENALTY PER VIOLATION PER DAY	PERIOD OF NONCOMPLIANCE
$ 250	DAYS 1-14

$ 500	DAYS 15-30
$1,000	DAYS 31+

75. In the event that EPA assumes performance of a portion or all of the Work pursuant to Paragraph 88 of Section XXI (Covenants Not to Sue by Plaintiffs) and in lieu of any other stipulated penalties that may apply under Paragraphs 72, 73 and 74, Settling Defendant shall be liable for a one-time stipulated penalty in the amount of $500,000.

76. All penalties shall begin to accrue on the day after the complete performance is due or the day a violation occurs, and shall continue to accrue through the final day of the correction of the noncompliance or completion of the activity. However, stipulated penalties shall not accrue: (1) with respect to a deficient submission under Section XI (EPA Approval of Plans and Other Submissions), during the period, if any, beginning on the 31st day after EPA's receipt of such submission until the date that EPA notifies Settling Defendant of any deficiency; (2) with respect to a decision by the Director of the Superfund Division, EPA Region V, under Paragraph 68.b. or 69.a. of Section XIX (Dispute Resolution), during the period, if any, beginning on the tenth day after the date that Settling Defendant's reply to EPA's Statement of Position is received until the date that the Director issues a final decision regarding such dispute; or (3) with respect to judicial review by this Court of any dispute under Section XIX (Dispute Resolution), during the period, if any, beginning on the 31st day after the Court's receipt of the final submission regarding the dispute until

the date that the Court issues a final decision regarding such dispute. Nothing herein shall prevent the simultaneous accrual of separate penalties for separate violations of this Consent Decree.

77. Following EPA's determination that Settling Defendant has failed to comply with a requirement of this Consent Decree, EPA shall give Settling Defendant written notification of the same and describe the noncompliance. EPA shall send the Settling Defendant a written demand for the payment of the penalties. However, penalties shall accrue as provided in the preceding Paragraph regardless of whether EPA has notified the Settling Defendant of a violation.

78. All penalties accruing under this Section shall be due and payable to the United States within 30 days of the Settling Defendant's receipt from EPA of a demand for payment of the penalties, unless Settling Defendant invokes the Dispute Resolution procedures under Section XIX (Dispute Resolution). All payments to the United States under this Section shall be paid by certified or cashier's check(s) made payable to "EPA Hazardous Substances Superfund," shall be mailed to U.S. EPA Region V, Attention: Superfund Accounting, P. O. Box 70753, Chicago, Illinois 60673, shall indicate that the payment is for stipulated penalties, and shall reference the EPA Region and Site/Spill ID Number 05AS, the DOJ Case Number 90-11-2-06028, and the name and address of the party making payment. Copies of check(s) paid pursuant to this Section, and any accompanying transmittal letter(s), shall be sent to the United

States as provided in Section XXVI (Notices and Submissions).

79. The payment of penalties shall not alter in any way Settling Defendant's obligation to complete the performance of the Work required under this Consent Decree.

80. Penalties shall continue to accrue as provided in Paragraph 76 during any dispute resolution period, but need not be paid until the following:

a. If the dispute is resolved by agreement or by a decision of EPA that is not appealed to this Court, accrued penalties determined to be owing shall be paid to EPA within 15 days of the agreement or the receipt of EPA's decision or order;

b. If the dispute is appealed to this Court and the United States prevails in whole or in part, Settling Defendant shall pay all accrued penalties determined by the Court to be owed to EPA within 60 days of receipt of the Court's decision or order, except as provided in Subparagraph c below;

c. If the District Court's decision is appealed by any Party, Settling Defendant shall pay all accrued penalties determined by the District Court to be owing to the United States into an interest-bearing escrow account within 60 days of receipt of the Court's decision or order. Penalties shall be paid into this account as they continue to accrue, at least every 60 days. Within 15 days of receipt of the final appellate court decision, the escrow agent shall pay the balance of the account to EPA or to Settling Defendant

to the extent that it prevails.

81. a. If Settling Defendant fails to pay stipulated penalties when due, the United States may institute proceedings to collect the penalties, as well as interest. Settling Defendant shall pay Interest on the unpaid balance, which shall begin to accrue on the date of demand made pursuant to Paragraph 78.

b. Nothing in this Consent Decree shall be construed as prohibiting, altering, or in any way limiting the ability of the United States to seek any other remedies or sanctions available by virtue of Settling Defendant's violation of this Decree or of the statutes and regulations upon which it is based, including, but not limited to, penalties pursuant to Section 122(l) of CERCLA. Provided, however, that the United States shall not seek civil penalties pursuant to Section 122(l) of CERCLA for any violation for which a stipulated penalty is provided herein, except in the case of a willful violation of the Consent Decree.

82. Notwithstanding any other provision of this Section, the United States may, in its unreviewable discretion, waive any portion of stipulated penalties that have accrued pursuant to this Consent Decree.

XXI. COVENANTS NOT TO SUE BY PLAINTIFF

83. In consideration of the actions that will be performed and the payments that will be made by the Settling Defendant under the

terms of the Consent Decree, and except as specifically provided in Paragraphs 84, 85, and 87 of this Section, the United States covenants not to sue or to take administrative action against Settling Defendant pursuant to Sections 106 and 107(a) of CERCLA, 42 U.S.C. §§9606 and 9607(a), and Section 7003 of RCRA, 42 U.S.C. §6973 relating to the Site. Except with respect to future liability, these covenants not to sue shall take effect upon the receipt by EPA of the payments required by Paragraph 54 of Section XVI (Reimbursement of Response Costs). With respect to future liability, these covenants not to sue shall take effect upon Certification of Completion of Remedial Action by EPA pursuant to Paragraph 51.b of Section XIV (Certification of Completion). These covenants not to sue are conditioned upon the satisfactory performance by Settling Defendant of its obligations under this Consent Decree. These covenants not to sue extend only to the Settling Defendant and do not extend to any other person.

84. United States' Pre-certification reservations. Notwithstanding any other provision of this Consent Decree, the United States reserves, and this Consent Decree is without prejudice to, the right to institute proceedings in this action or in a new action, or to issue an administrative order seeking to compel Settling Defendant (1) to perform further response actions relating to the Site or (2) to reimburse the United States for additional costs of response if, prior to Certification of Completion of the

Remedial Action:

(i) conditions at the Site, previously unknown to EPA, are discovered, or

(ii) information, previously unknown to EPA, is received, in whole or in part,

and these previously unknown conditions or information together with any other relevant information indicates that the Remedial Action is not protective of human health or the environment.

85. United States' Post-certification reservations. Notwithstanding any other provision of this Consent Decree, the United States reserves, and this Consent Decree is without prejudice to, the right to institute proceedings in this action or in a new action, or to issue an administrative order seeking to compel Settling Defendant (1) to perform further response actions relating to the Site or (2) to reimburse the United States for additional costs of response if, subsequent to Certification of Completion of the Remedial Action:

(i) conditions at the Site, previously unknown to EPA, are discovered, or

(ii) information, previously unknown to EPA, is received, in whole or in part,

and these previously unknown conditions or this information together with other relevant information indicate that the Remedial Action is not protective of human health or the environment.

86. For purposes of Paragraph 84, the information and the conditions known to EPA shall include only that information and those conditions known to EPA as of the date the ROD was signed and set forth in the Record of Decision for the Site; the administrative record supporting the Record of Decision; the Plume Profiling Investigation (data transmitted to EPA/MDEQ August 25, 1998); the SVE Pilot Test (data transmitted to EPA/MDEQ August 28, 1998); and the EPA Kerr Laboratory John Wilson Lake Investigation (data received by Bosch June 22, 1998). For purposes of Paragraph 85, the information and the conditions known to EPA shall include only that information and those conditions known to EPA as of the date of Certification of Completion of the Remedial Action and set forth in the Record of Decision, the administrative record supporting the Record of Decision, the Plume Profiling Investigation (data transmitted to EPA/MDEQ August 25, 1998); the SVE Pilot Test (data transmitted to EPA/MDEQ August 28, 1998); and the EPA Kerr Laboratory John Wilson Lake Investigation (data received by Bosch June 22, 1998); the post-ROD administrative record, or in any information received by EPA pursuant to the requirements of this Consent Decree prior to Certification of Completion of the Remedial Action.

87. General reservations of rights. The covenants not to sue set forth above do not pertain to any matters other than those expressly specified in Paragraph 83. The United States reserves, and this Consent Decree is without prejudice to, all rights against Settling

Defendant with respect to all other matters, including but not limited to, the following:

(1) claims based on a failure by Settling Defendant to meet a requirement of this Consent Decree;

(2) liability arising from the past, present, or future disposal, release, or threat of release of Waste Materials outside of the Site;

(3) liability for future disposal of Waste Material at the Site, other than as provided in the ROD, the Work, this Consent Decree, or otherwise ordered by EPA;

(4) liability for damages for injury to, destruction of, or loss of natural resources, and for the costs of any natural resource damage assessments;

(5) criminal liability;

(6) liability for violations of federal or state law which occur during or after implementation of the Remedial Action; and

(7) liability, prior to Certification of Completion of the Remedial Action, for additional response actions that EPA determines are necessary to achieve Performance Standards, but that cannot be required pursuant to Paragraph 13 (Modification of the SOW or Related Work Plans).

88. Work Takeover. In the event EPA determines that Settling Defendant has ceased implementation of any portion of the Work, are seriously or repeatedly deficient or late in their performance of the

Work, or are implementing the Work in a manner which may cause an endangerment to human health or the environment, EPA may assume the performance of all or any portions of the Work as EPA determines necessary. Settling Defendant may invoke the procedures set forth in Section XIX (Dispute Resolution), Paragraph 68, to dispute EPA's determination that takeover of the Work is warranted under this Paragraph. Costs incurred by the United States in performing the Work pursuant to this Paragraph shall be considered Future Response Costs that Settling Defendant shall pay pursuant to Section XVI (Reimbursement of Response Costs).

89. Notwithstanding any other provision of this Consent Decree, the United States retains all authority and reserves all rights to take any and all response actions authorized by law.

XXII. COVENANTS BY SETTLING DEFENDANTS

90. Covenant Not to Sue. Subject to the reservations in Paragraph 91, Settling Defendant hereby covenants not to sue and agrees not to assert any claims or causes of action against the United States with respect to the Site or this Consent Decree, including, but not limited to:

a. any direct or indirect claim for reimbursement from the Hazardous Substance Superfund (established pursuant to the Internal Revenue Code, 26 U.S.C. § 9507) through CERCLA Sections 106(b)(2), 107, 111, 112, 113 or any other provision of law;

b. any claims against the United States, including any department, agency or instrumentality of the United States under CERCLA Sections 107 or 113 related to the Site, or

c. any claims arising out of response activities at the Site, including claims based on EPA's selection of response actions, oversight of response activities or approval of plans for such activities.

The Settling Defendant reserves, and this Consent Decree is without prejudice to, claims against the United States, subject to the provisions of Chapter 171 of Title 28 of the United States Code, for money damages for injury or loss of property or personal injury or death caused by the negligent or wrongful act or omission of any employee of the United States while acting within the scope of his office or employment under circumstances where the United States, if a private person, would be liable to the claimant in accordance with the law of the place where the act or omission occurred. However, any such claim shall not include a claim for any damages caused, in whole or in part, by the act or omission of any person, including any contractor, who is not a federal employee as that term is defined in 28 U.S.C. § 2671; nor shall any such claim include a claim based on EPA's selection of response actions, or the oversight or approval of the Settling Defendant's plans or activities. The foregoing applies only to claims which are brought pursuant to any statute other than CERCLA and for which the waiver of sovereign immunity is found in a

statute other than CERCLA.

1.Nothing in this Consent Decree shall be deemed to constitute preauthorization of a claim within the meaning of Section 111 of CERCLA, 42 U.S.C § 9611, or 40 C.F.R. § 300.700(d).

XXIII. EFFECT OF SETTLEMENT; CONTRIBUTION PROTECTION

93. Nothing in this Consent Decree shall be construed to create any rights in, or grant any cause of action to, any person not a Party to this Consent Decree. The preceding sentence shall not be construed to waive or nullify any rights that any person not a signatory to this decree may have under applicable law. Each of the Parties expressly reserves any and all rights (including, but not limited to, any right to contribution), defenses, claims, demands, and causes of action which each Party may have with respect to any matter, transaction, or occurrence relating in any way to the Site against any person not a Party hereto.

94. The Parties agree, and by entering this Consent Decree this Court finds, that the Settling Defendant is entitled, as of the effective date of this Consent Decree, to protection from contribution actions or claims as provided by CERCLA Section 113(f)(2), 42 U.S.C. § 9613(f)(2), for matters addressed in this Consent Decree.

95. The Settling Defendant agrees that with respect to any suit or claim for contribution brought by them for matters related to this

Consent Decree they will notify the United States in writing no later than 60 days prior to the initiation of such suit or claim.

96. The Settling Defendant also agrees that with respect to any suit or claim for contribution brought against them for matters related to this Consent Decree they will notify in writing the United States within 10 days of service of the complaint on them. In addition, Settling Defendant shall notify the United States within 10 days of service or receipt of any Motion for Summary Judgment and within 10 days of receipt of any order from a court setting a case for trial.

97. In any subsequent administrative or judicial proceeding initiated by the United States for injunctive relief, recovery of response costs, or other appropriate relief relating to the Site, Settling Defendant shall not assert, and may not maintain, any defense or claim based upon the principles of waiver, res judicata, collateral estoppel, issue preclusion, claim-splitting, or other defenses based upon any contention that the claims raised by the United States in the subsequent proceeding were or should have been brought in the instant case; provided, however, that nothing in this Paragraph affects the enforceability of the covenants not to sue set forth in Section XXI (Covenants Not to Sue by Plaintiffs).

XXIV. ACCESS TO INFORMATION

98. Settling Defendant shall provide to EPA, upon request, copies

of all documents and information within its possession or control or that of its contractors or agents relating to the implementation of this Consent Decree, including, but not limited to, sampling, analysis, chain of custody records, manifests, trucking logs, receipts, reports, sample traffic routing, correspondence, or other documents or information related to the Work. Settling Defendant shall also make available to EPA for purposes of investigation, information gathering, or testimony, its employees, agents, or representatives with knowledge of relevant facts concerning the performance of the Work.

99. a. Settling Defendant may assert business confidentiality claims covering part or all of the documents or information submitted to Plaintiff under this Consent Decree to the extent permitted by and in accordance with Section 104(e)(7) of CERCLA, 42 U.S.C. § 9604(e)(7), and 40 C.F.R. § 2.203(b). Documents or information determined to be confidential by EPA will be afforded the protection specified in 40 C.F.R. Part 2, Subpart B. If no claim of confidentiality accompanies documents or information when they are submitted to EPA, or if EPA has notified Settling Defendant that the documents or information are not confidential under the standards of Section 104(e)(7) of CERCLA, the public may be given access to such documents or information without further notice to Settling Defendant.

b. The Settling Defendant may assert that certain documents,

records and other information are privileged under the attorney-client privilege or any other privilege recognized by federal law. If the Settling Defendant asserts such a privilege in lieu of providing documents, it shall provide the Plaintiff with the following: (1) the title of the document, record, or information; (2) the date of the document, record, or information; (3) the name and title of the author of the document, record, or information; (4) the name and title of each addressee and recipient; (5) a description of the contents of the document, record, or information: and (6) the privilege asserted by Settling Defendant. However, no documents, reports or other information created or generated pursuant to the requirements of the Consent Decree shall be withheld on the grounds that they are privileged except (i) drafts of final documents; (ii) documents generated for Dispute Resolution proceedings (Section XIX) that are not Statements of Position or Replies; or (iii) documents which have been provided to the neutral as confidential under the terms of an alternative dispute resolution agreement.

100. No claim of confidentiality shall be made with respect to any data generated pursuant to this Consent Decree, including, but not limited to, all sampling, analytical, monitoring, hydrogeologic, scientific, chemical, or engineering data, or any other documents or information evidencing conditions at or around the Site.

XXV. RETENTION OF RECORDS

101. Until 30 years after entry of this Consent Decree the Settling Defendant shall preserve and retain all records and documents now in its possession or control or which come into its possession or control that relate in any manner to the performance of the Work or liability of any person for response actions conducted and to be conducted at the Site, regardless of any corporate retention policy to the contrary. Until 30 years after entry of this Consent Decree Settling Defendant shall also instruct its contractors and agents to preserve all documents, records, and information of whatever kind, nature or description relating to the performance of the Work.

102. At the conclusion of this document retention period, Settling Defendant shall notify the United States at least 90 days prior to the destruction of any such records or documents, and, upon request by the United States, Settling Defendant shall deliver any such records or documents to EPA. However, Settling Defendant shall retain and shall not destroy any of the following documents until ten (10) years after Settling Defendant's receipt of EPA's notification pursuant to Paragraph 51.b of Section XIV (Certification of Completion of the Work):

Remedial Investigation Report
Feasibility Study Report
Record of Decision
Consent Decree (and Appendices)
Long-Term Monitoring Plan (including Contingency Plan)
RD/RA Work Plans

Following the initial 30-year period after entry of this Consent Decree, for all other documents subsequently created, Settling Defendant shall retain such records until completion of the next five-year review undertaken pursuant to Section VII. Following approval of the five-year review documents, Settling Defendant shall notify the United States at least 90 days prior to the destruction of such records or documents and, upon request by the United States Settling Defendant shall deliver documents to such parties. The Settling Defendant may assert that certain documents, records and other information are privileged under the attorney-client privilege or any other privilege recognized by federal law. If the Settling Defendant assert such a privilege, they shall provide the Plaintiff with the following: (1) the title of the document, record, or information; (2) the date of the document, record, or information; (3) the name and title of the author of the document, record, or information; (4) the name and title of each addressee and recipient; (5) a description of the subject of the document, record, or information; and (6) the privilege asserted by Settling Defendant. However, no documents, reports or other information created or generated pursuant to the requirements of the Consent Decree shall be withheld on the grounds that they are privileged.

103. Settling Defendant hereby certifies that, to the best of its knowledge and belief, after thorough inquiry, it has not altered, mutilated, discarded, destroyed or otherwise disposed of any records, documents or other information relating to its potential liability regarding the Site since notification of potential liability by the United States or the filing of suit against it regarding the Site and that it has fully complied with any and all EPA requests for information pursuant to Section 104(e) and 122(e) of CERCLA, 42 U.S.C. 9604(e) and 9622(e), and Section 3007 of RCRA, 42 U.S.C. 6927.

XXVI. NOTICES AND SUBMISSIONS

104. Whenever, under the terms of this Consent Decree, written notice is required to be given or a report or other document is required to be sent by one Party to another, it shall be directed to the individuals at the addresses specified below, unless those individuals or their successors give notice of a change to the other Party in writing. All notices and submissions shall be considered effective upon receipt, unless otherwise provided. Written notice as specified herein shall constitute complete satisfaction of any written notice requirement of the Consent Decree with respect to the United States, EPA, and the Settling Defendant, respectively.

As to the United States:

Chief, Environmental Enforcement Section
Environment and Natural Resources Division
U.S. Department of Justice
P.O. Box 7611
Ben Franklin Station
Washington, D.C. 20044
Re: DOJ #90-11-2-06028

And

William E. Muno
Director Superfund Division
United States Environmental Protection Agency
Region V
77 W. Jackson Blvd.
Chicago, Illinois 60604

As to EPA:

Kenneth Glatz
EPA Project Coordinator
United States Environmental Protection Agency
Region V
77 W. Jackson Blvd.
Chicago, Illinois 60604
Mail Code SR-6J

As to the Settling Defendant:

Gregory Kerr
Manager, Health Safety & Environmental
Bosch Braking System Corp.
3737 Red Arrow Highway
St. Joseph, Michigan 49085

And

David Van Slyke, Esq.
Preti, Flaherty, Beliveau & Pachios, LLC
One City Center
P.O. Box 9546
Portland, ME 04112-9546

And

Karl D. Kasper

Settling Defendant's Project Coordinator
Woodard & Curran
41 Hutchins Drive
Portland, ME 04102

Any notice or other communications with the State regarding this Consent Decree shall be sent to:

Mark Henry
State Project Coordinator
Michigan DEQ
P.O. Box 30426
Lansing, MI 48909-7973

XXVII. EFFECTIVE DATE

105. The effective date of this Consent Decree shall be the date upon which this Consent Decree is entered by the Court, except as otherwise provided herein.

XXVIII. RETENTION OF JURISDICTION

106. This Court retains jurisdiction over both the subject matter of this Consent Decree and the Settling Defendant for the duration of the performance of the terms and provisions of this Consent Decree for the purpose of enabling any of the Parties to apply to the Court at any time for such further order, direction, and relief as may be necessary or appropriate for the construction or modification of this Consent Decree, or to effectuate or enforce compliance with its terms, or to resolve disputes in accordance with Section XIX (Dispute Resolution) hereof.

XXIX. APPENDICES

107. The following appendices are attached to and incorporated into this Consent Decree:

"Appendix A" is the ROD;

"Appendix B" is the SOW;

"Appendix C" is Site Map;

"Appendix D" is the Draft Notice of Obligations to Successors-in-Title;

"Appendix E" is the Draft Easement;

"Appendix F" is the List of Site Access Agreements;

"Appendix G" is the List of Restrictive Covenants; and

"Appendix H" is the Berrien County, Michigan Private and Type III Public Groundwater Supply Ordinance.

XXX. COMMUNITY RELATIONS

108. Settling Defendant shall propose to EPA their participation in the community relations plan to be developed by EPA. EPA will determine the appropriate role for the Settling Defendant under the Plan. Settling Defendant shall also cooperate with EPA in providing information regarding the Work to the public. As requested by EPA, Settling Defendant shall participate in the preparation of such information for dissemination to the public and in public meetings which may be held or sponsored by EPA to explain activities at or relating to the Site.

XXXI. MODIFICATION

109. Schedules specified in this Consent Decree for completion of the Work may be modified by agreement of EPA and the Settling Defendant. All such modifications shall be made in writing.

Except as provided in Paragraph 13 ("Modification of the SOW or related Work Plans"), no material modifications shall be made to the SOW without written notification to and written approval of the United States, Settling Defendant, and the Court. Prior to providing its approval to any modification, the United States will provide the State with a reasonable opportunity for review and comment on the proposed modification. Modifications to the SOW other than to the schedules in the SOW or Work Plans required pursuant to the SOW that do not materially alter that document may be made by written agreement between EPA, after providing the State with a reasonable opportunity for review and comment on the proposed modification, and the Settling Defendant.

111. Nothing in this Decree shall be deemed to alter the Court's power to enforce, supervise or approve modifications to this Consent Decree.

XXXII. LODGING AND OPPORTUNITY FOR PUBLIC COMMENT

112. This Consent Decree shall be lodged with the Court for a period of not less than thirty (30) days for public notice and comment in accordance with Section 122(d)(2) of CERCLA, 42 U.S.C. § 9622(d)(2), and 28 C.F.R. § 50.7. The United States reserves the right to withdraw or withhold its consent if the comments regarding the Consent Decree disclose facts or considerations which indicate that the Consent Decree is inappropriate, improper, or inadequate. Settling Defendant consents to the entry of this Consent Decree without further notice.

113. If for any reason the Court should decline to approve this Consent Decree in the form presented, this agreement is voidable at the sole discretion of any Party and the terms of the agreement may not be used as evidence in any litigation between the Parties.

XXXIII. SIGNATORIES/SERVICE

114. Each undersigned representative of the Settling Defendant to this Consent Decree, the Assistant Attorney General for Environment and Natural Resources of the Department of Justice, and the U. S. Environmental Protection Agency certifies that he or she is fully authorized to enter into the terms and conditions of this Consent Decree and to execute and legally bind such Party to this document.

115. The Settling Defendant hereby agrees not to oppose entry of this Consent Decree by this Court or to challenge any provision of

this Consent Decree unless the United States has notified the Settling Defendant in writing that it no longer supports entry of the Consent Decree.

116. The Settling Defendant shall identify, on the attached signature page, the name, address and telephone number of an agent who is authorized to accept service of process by mail on behalf of that Party with respect to all matters arising under or relating to this Consent Decree. Settling Defendant hereby agrees to accept service in that manner and to waive the formal service requirements set forth in Rule 4 of the Federal Rules of Civil Procedure and any applicable local rules of this Court, including, but not limited to, service of a summons. SO ORDERED, THIS 5th DAY OF October, 1999.

Douglas W. Hillman

United States District Judge

DOUGLAS W. HILLMAN
SENIOR JUDGE

[signature]

Date 12/3/99

THE UNDERSIGNED PARTIES enter into this Consent Decree in the matter of United States v. Robert Bosch Corporation relating to the Bendix/Bosch Braking Systems Superfund Site.

FOR THE UNITED STATES OF AMERICA

Date: 6-3-99

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Washington, D.C. 20530

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United States v. Robert Bosch Corporation
Consent Decree Signature Page

THE UNDERSIGNED PARTY enters into this Consent Decree in the matter of United States v. Robert Bosch Corporation, relating to the Bendix/Bosch Braking Systems Superfund Site.

FOR BOSCH BRAKING SYSTEMS, A DIVISION OF ROBERT BOSCH CORPORATION

Date: March 30, 1999

Gary M. Saunders
Executive Vice President and Chief Financial Officer
Robert Bosch Corporation

Agent Authorized to Accept Service on Behalf of Above-signed Party:

David B. Van Slyke, Esq.
Environmental Practice Group Chair
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APPENDIX A

RECORD OF DECISION

REMEDIAL ACTION

BENDIX SUPERFUND SITE

ST. JOSEPH, MICHIGAN

September, 1997

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DECLARATION

SELECTED REMEDIAL ACTION FOR THE BENDIX SUPERFUND SITE ST. JOSEPH, MICHIGAN

STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected remedial action for the Bendix Superfund Site (Bendix Site) in St. Joseph, Michigan and describes the legal and technical basis for the selection. The remedial action was chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986, and is in compliance with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) to the extent practicable. This decision is supported by documentation contained in the Administrative Record for the Bendix Site.

The State of Michigan Department of Environmental Quality (MDEQ) concurs with the selected remedy.

ASSESSMENT OF THE BENDIX SITE

Actual or threatened releases of hazardous substances from this Bendix Site, if not addressed by implementing the response action selected in this Record of Decision (ROD), present a potential future threat to public health, welfare, or the environment.

DESCRIPTION OF THE SELECTED REMEDY

This final remedial action addresses contamination associated with two ground water plumes at the Bendix Site (Western Plume and Eastern Plume). The statutory and regulatory requirements for the remedial action at the Bendix Site are to:

- Reduce/eliminate the potential risks to human health associated with exposure to chlorinated volatile organic compounds (VOCs) in the Western and Eastern Plumes;
- Reduce the concentrations of VOCs in the Western and Eastern Plumes to drinking water standards;
- Reduce/control the VOC source of contaminants; and
- Satisfy Applicable or Relevant and Appropriate Requirements (ARARs).

The selected remedial alternative for the Bendix Site is Alternative 3: Ground Water Institutional Controls and Deed Restrictions, Soil Vapor Extraction (Eastern Plume Inferred Source Removal), and Monitored Natural Attenuation (Eastern and Western Plumes). The selected remedy focuses on confirming and monitoring the natural degradation of contaminants that is occurring in the Western and Eastern Plumes. If GSI criteria exceedences are predicted or detected through monitoring, contingency plans will be implemented to insure compliance with the GSI criteria. In addition, a soil vapor extraction (SVE) system in the vicinity of the Eastern Plume source area would be used to control/reduce VOCs in the vadose zone soils. The major components of this remedy include:

- Environmental monitoring to evaluate the effectiveness of natural attenuation processes in the Plumes
- Deed restrictions to prohibit future ground water use
- Land use restrictions to restrict access to Bendix Site-related VOCs in vadose zone soils
- Natural attenuation of ground water Plumes to continue destruction of ground water contaminants
- Five-year site reviews

In addition the following three components will be implemented to address the Eastern Plume source area:

- Maintenance of existing cover system to minimize infiltration of precipitation to VOCs in vadose zone soils and restrict access to/direct contact with those soils
- Operation of SVE system to control/reduce contaminants in the vadose zone
- Installation of SVE vapor phase treatment system to remove VOCs from the treatment off-gases

STATUTORY DETERMINATIONS

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

Because this remedy will result in hazardous substances remaining on site, a review will be conducted within five years after start-up of the remedial action to ensure that the remedy continues to provide adequate protection of human health and the environment. This review will be conducted at least every five years as long as hazardous substances are present above health-based clean-up levels.

STATE CONCURRENCE

Upon receipt, the State of Michigan concurrance letter will be included in the Administrative Record and Appendix A of this ROD

William E. Muno
Superfund Division Director
U S EPA Region V

9/30/97
Date

DECISION SUMMARY

I. SITE NAME, LOCATION, AND DESCRIPTION

The Bendix Superfund Site is a National Priorities List (NPL) site located in Lincoln Township, Berrien County, Michigan, approximately four miles south of the City of St. Joseph (Figure 1). The Bendix Site is located at 3737 Red Arrow Highway, approximately one-half mile from the eastern shore of Lake Michigan, and approximately one-third mile west of Hickory Creek, and bordered to the west by Red Arrow Highway.

The Bendix Site's topography is generally flat and the land surface is mostly covered by manufacturing buildings and pavement. The land surface rises slightly to the west of the Bendix Plant to the lake bluff. The land surface to the east gently slopes toward Hickory Creek falling steeply away at the creek. Land surface between Hickory Creek and Lake Michigan is generally open and covered with grass, allowing rainwater to recharge ground water. Ground water flows beneath the Bendix Site from the south. A natural divide causes ground water to flow from the Bendix Site toward Hickory Creek (to the east) and toward Lake Michigan (to the west). Hickory Creek and Lake Michigan are used for recreational purposes. Ground water associated with the Bendix Site is not used. The entire area adjacent to the Bendix Site is supplied with drinking water from the City of St. Joseph municipal water supply. The source of the drinking water is Lake Michigan.

Currently, land use in the vicinity of the Bendix Site is a mixture of commercial, residential, and industrial. The area between Red Arrow Highway and Lake Michigan is mostly residential. Commercial and industrial facilities are located between the Bendix Site and Hickory Creek. Areas north and south of the Bendix Site are a mixture of commercial and residential properties.

II. SITE HISTORY AND ENFORCEMENT ACTIVITIES

The Bendix Site was originally farmland but was developed in 1939 by the Nylen Products Corporation. The 36-acre facility consisted of an iron casting foundry and a machine shop. The Bendix Corporation (Bendix) purchased the property in 1952 that was later acquired by Allied Chemical in 1983. It's successor, AlliedSignal Inc. sold the facility to Bosch Braking Systems Corporation (Bosch, current owner) in 1996. The facility currently contains a foundry and a manufacturing plant (Figure 2).

Oil-based cutting fluids were used at the facility during the 1950s and 1960s. Water-soluble cutting fluids were used beginning in 1967. Chlorinated solvents were reportedly used in the 1960s and 1970s. From 1965 to 1975, foundry dust collector and machine shop oily waste waters were disposed into three former unlined lagoons: (1) foundry "A" lagoon, (2) south lagoon, and (3) the loading dock lagoon. The foundry "A" lagoon and the loading dock lagoon were closed and their contents disposed into the south lagoon. The south lagoon was closed in 1978 with the installation of a Michigan Department of Natural Resources (MDNR)-approved clay cap. Bendix used an on-site liquid incinerator, lagoons, and off-site commercial disposal facilities until the mid 1970s. A landfill (Maiden Lane Landfill) was also used from 1966 to 1979 for the disposal of foundry residues, asbestos in brake shoes, and encapsulated asbestos pellets. Environmental investigations began at the Bendix Site in 1975 when three ground water wells were installed around the south lagoon. Since that time numerous investigations have been conducted to evaluate the nature and distribution of industrial chemicals in soil, ground water, surface water, and sediments associated with the Bendix Site and

neighboring properties. Industrial chemicals identified in the environment include both organic and inorganic compounds associated with the manufacture of braking systems.

In June 1988, the Bendix Site was proposed for inclusion on the NPL. AlliedSignal, Inc., owners of the Bendix Site at that time, were informed that it was potentially responsible for contamination at the Bendix Site. On February 13, 1989, AlliedSignal entered into a Consent Agreement with U.S. EPA to conduct a Remedial Investigation and Feasibility Study (RI/FS). The Bendix Site was officially listed on the NPL on February 15, 1990.

As a result of industrial activities at the Bendix Site and the natural ground water divide, two VOC Plumes have been identified (Eastern and Western Plumes). The major site-related contaminants are trichloroethylene (TCE) and its degradation products. The Eastern Plume source is in the vicinity of the loading dock, creating a Plume that extends northeast to its primary discharge point along Hickory Creek. The Western Plume originates in the area of the north parking lot and extends to the northwest where it discharges to Lake Michigan (see Figure 2). The closed south lagoon is located over the ground water divide and continues to release low levels of industrial cutting oil residuals to the ground water.

III. HIGHLIGHTS OF COMMUNITY PARTICIPATION

A complete chronology of community relations activities for the Bendix Superfund Site is provided in the Responsiveness Summary (Appendix C). Recent activities include issuance of the RI/FS report and the Proposed Plan for the Bendix Site. These documents were introduced into the Administrative Record on August 12, 1997. Bendix Site documents are available to the public as part of the Administrative Record which is housed at three information repository locations: (1) U.S. EPA Docket Room for Region V in Chicago, Illinois; (2) Maud Preston Palenske Memorial Library in St. Joseph, Michigan; and (3) Lincoln Township Public Library in Stevensville, Michigan. The Administrative Record index and addresses of the Information Repositories are presented in Appendix B.

A Public Comment period was held from August 14, 1997 to September 12, 1997. U.S. EPA and Bosch ran a concurrent news release on August 13, 1997, in the St. Joseph Herald Palladium to announce the comment period and the Public Meeting. A Public Meeting was held August 20, 1997 at the Lincoln Township Hall in Stevensville, Michigan. The meeting included a summary of site history and a presentation of the proposed remedy. The response to the comments received during the public comment period is included in the Responsiveness Summary (Appendix C).

IV. SCOPE AND ROLE OF THE RESPONSE ACTION

The selected remedy for the Bendix Site provides a comprehensive approach for site remediation. The remedy includes natural attenuation of the Eastern and Western Plumes by natural degradation of VOCs in Bendix Site ground water. If GSI criteria exceedences are predicted or detected through monitoring, contingency plans will be implemented to insure compliance with the GSI criteria. Additionally, an SVE treatment system in the vicinity of the Eastern Plume source area will be utilized to remove VOCs from vadose zone soils. These VOCs are a source of ground water contamination in the Eastern Plume. Contaminants will be captured through vapor extraction wells. Emissions from the SVE capture system will be treated using photocatalytic oxidation to destroy VOCs in the off-gases prior to discharge.

These remedial actions will prevent the potential for future human health risks associated with exposure to

VOCs in the ground water Plumes and the air through volatile emissions by (1) reducing VOC concentrations in the Eastern Plume source area (2) reducing volatile emissions in the vadose zone over the Eastern Plume, and (3) reducing concentrations of VOCs in ground water associated with the Eastern and Western Plumes. In the event that monitoring shows confirmed, statistically significantly exceedences of ground water contamination above the established values at the point of compliance (POC), a contingency plan will be implemented to prevent further release of contaminants into surface water bodies.

V. SUMMARY OF SITE CHARACTERISTICS

A. LAND USE

Land use in the area of the Bendix Site is a mixture of agricultural, industrial, residential, and recreational. The source of drinking water in the area is primarily Lake Michigan surface water via the St. Joseph municipal water supply system. The entire area in the vicinity of the Bendix Site has access to this public water supply. Water supply surveys have been conducted by MDEQ and Bendix/Bosch over the past several years. The results indicate that contaminated ground water is not being used as a primary drinking water source. Select residential drinking water wells located primarily to the east of Hickory Creek will continue to be monitored periodically for site contaminants.

B. SURFACE WATER

Two surface water bodies dominate the surface water drainage in the vicinity of the Bendix Site; Lake Michigan to the west and Hickory Creek to the east (see Figure 2). The Bendix Site is situated on a topographic divide approximately one-half mile east of Lake Michigan and one-third of a mile west of Hickory Creek. Bosch is currently discharging non-contact cooling water and storm water runoff to Hickory Creek. This is a permitted discharge in compliance with the provisions of the Federal Water Pollution Control Act. The storm water collection system for the plant is fully described in the Bosch MDNR National Pollutant Discharge Elimination System permit No. MI003174.

C. GEOLOGY

The current land surface features are dominated by the deposition and subsequent erosion of Wisconsin continental ice sheets. These deposits are generically referred to as glacial drift, which was deposited as the ice sheet advanced (tills and moraine deposits), or as the ice melted and reworked unconsolidated deposits. The majority of the area around the Bendix Site was submerged below glacial Lake Chicago and consists of lacustrine deposits, which are characterized as deep water deposits made up of fine sand, silts and clay. The final stages of deglaciation resulted in unvegetated planes of exposed sand. This sand was reworked by surface drainages, creating the incised drainage currently occupied by Hickory Creek. Dune sand deposits along the present-day shoreline of Lake Michigan are windblown sand forming the lake shore bluff.

The uppermost soil unit at the Bendix Site is a fine to medium sand. This sand extends from the surface to approximately 40 to 50 feet below ground surface. This medium to fine sand unit allows rain water to infiltrate the subsurface and recharge the ground water. This unit also has the greatest hydraulic conductivity (K), which has been measured in the 10^{-3} to 10^{-4} cm/sec range (Keck, 1986 and W&C, 1995). Therefore, this unit is of particular interest with regard to contaminant transport. These fine to medium sands grade to fine silty sands with depth.

At an elevation of between 580 and 560 feet above Mean Sea Level (MSL), the soil type changes to

interlayered clayey silts and silty sands with occasional gravel. This unit is discontinuous and is most prevalent below the eastern side of the Bendix Site. When present, this fine-grained unit ranges in thickness from a few feet to approximately 20 feet. The K values of the silt/clay layers are generally 10^{-5} cm/sec with occasional 10^{-6} cm/sec values in the clay units (W&C, 1995). The interlayered silty sands have K values ranging from 10^{-4} to 10^{-3} cm/sec. Ground water movement through this interlayered unit will occur principally within the more conductive thin silty sand layers.

Below the interlayered clayey silt sand is a stiff clay to silty clay. This clay unit is most prevalent at the center of the Bendix Site near the plant. The K value of this unit was measured at 10^{-6} cm/sec (W&C, 1995). This unit has a significantly lower permeability than the sands located stratigraphically above, and will act as a hydraulic barrier to the vertical migration of ground water and/or contaminants.

D. HYDROGEOLOGY

Regional ground water flow is toward Lake Michigan with a current lake elevation of 580 feet above MSL. The maximum ground water elevation in the vicinity of the plant is approximately 600 feet above MSL. Superimposed on this regional flow are the localized effects of Hickory Creek. Hickory Creek has incised the sandy surface soils to a current creek elevation of 586 feet above MSL. This elevation difference between the ground water and the creek causes the localized ground water to flow toward Hickory Creek. This has created a ground water divide in the vicinity of the Bendix/Bosch plant (see Figure 2). Ground water on the east side of this divide flows toward and discharges to Hickory Creek, while ground water on the west side of this divide flows toward and discharges to Lake Michigan.

Directly beneath the Bendix Site, there are three distinct hydrogeologic units, the unconfined water table aquifer, a series of aquicludes (semi-confining layers) consisting of interbedded silts and sands; and the lower clay unit acting as an aquatard (confining layer).

VI. MAJOR FINDINGS - REMEDIAL INVESTIGATION AND RISK ASSESSMENT

In July of 1997, the RI report for the Bendix Site was issued. The nature and distribution of contaminants at the Bendix Site have been investigated since the early 1980s. Industrial chemicals identified in the environment include both organic compounds and inorganic elements associated with the manufacture of braking systems. The most frequently detected contaminants at the Bendix Site are TCE and 1,1,1-trichloroethane (1,1,1-TCA), along with their degradation products, vinyl chloride, cis-1,2-dichloroethene (cis-1,2-DCE) and trans-1,2-dichloroethene (trans-1,2-DCE), and 1,1-dichloroethane (1,1-DCA).

The Bendix Site is located on a ground water divide approximately half way between Lake Michigan to the west and Hickory Creek to the east. As a result of industrial activities occurring at the Bendix Site and the natural ground water divide, two VOC ground water Plumes have been identified as the Western and Eastern Plumes (see Figure 2)

A. SOURCE AREAS

The Western Plume originates in the area of the north parking lot and extends to the northwest where it discharges to Lake Michigan. The Eastern Plume originates in the area of the current loading dock creating a Plume that extends northeast to its discharge point along Hickory Creek. During the RI several potential source areas were evaluated, and the following three were identified as significant continuing sources of

contaminants to ground water:

- the former south lagoon;
- the inferred deep VOC source below the north parking lot; and
- the inferred shallow VOC source in the vicinity of the loading dock.

1. Former South Lagoon

The former south lagoon is located at the south end of the Bendix Site upgradient of the plant. This location is situated across the ground water divide (see Figure 2). As a result, ground water flowing below the former south lagoon diverges, moving both east toward Hickory Creek and west toward Lake Michigan. The lagoon was operated as an evaporation/infiltration lagoon from 1965 to 1975. The lagoon received waste water from the foundry and manufacturing plant. This material contained both petroleum- and vegetable-based cutting oils, and possibly some chlorinated hydrocarbons. The non-chlorinated compounds appear to be the primary food source (substrate) for microbial activity occurring in the ground water below and down gradient of the closed south lagoon. As a result of this microbial activity, the ground water below and down gradient of the lagoon has become anoxic (depleted of oxygen). This is a critical step in the anaerobic dechlorination of chlorinated VOCs that is occurring within both the Western and Eastern Plumes.

2. Western Plume

The inferred source of the Western Plume is a deep TCE dense non-aqueous phase liquid (DNAPL) that is located beneath the north parking lot approximately 70 to 80 feet below ground surface. VOCs detected above the federal Maximum Contaminant Levels (MCLs) in the Western Plume include vinyl chloride, 1-1-dichloroethene (1,1-DCE), 1,2-dichloroethene (1,2-DCE) (total of cis- and trans-), and TCE. Once the source material has dissolved into the ground water, it travels predominantly by advection. The ground water in this area is flowing toward and discharging to Lake Michigan (see Figure 2). VOCs were not detected in the surface water of Lake Michigan, however they do exceed estimated mixing zone based criteria.

3. Eastern Plume

The Eastern Plume is primarily a chlorinated solvent Plume that emanates from the area of the loading dock and to a lesser extent the former south lagoon. VOCs detected above the MCLs in the Eastern Plume include vinyl chloride, 1,1-DCE, cis-1,2-DCE, trans-1,2-DCE, and TCE. The Plume extends from the loading dock area to the northeast; in the vicinity of Maiden Lane, the Plume is drawn to the east by the low head conditions created along Hickory Creek (see Figure 2). Based on the results of the RI, the source of the Eastern Plume is located at approximately 30 feet below ground surface in the vicinity of the water table (Figure 4). This source material is inferred and has not been directly observed or sampled. The nature of the source material and its location has been inferred based on ground water samples collected directly below the loading dock. High concentrations of VOCs (cis-1,2-DCE at 440,000 μg/L) in the shallow ground water with correspondingly low concentrations of VOCs from deeper ground water samples indicate the presence of a non aqueous phase liquid (NAPL) at or near the capillary fringe directly below the loading dock, but not deeper within the aquifer.

The Eastern Plume consists primarily of TCE and its degradation products (e.g., cis-1,2-DCE and vinyl chloride). The Plume extends from the source areas (former south lagoon and loading dock area) to Hickory Creek. Eastern Plume ground water appears to be discharging to Hickory Creek. Concentrations of Plume-related contaminants detected in the shallow ground water monitoring wells closest to Hickory Creek exceed the MDEQ estimated Ground Water/Surface Water (GSI) mixing zone based criteria. Predictive mixing-

zone based modeling for Hickory Creek indicates the Plume complies with the mixing-zone based GSI criteria at the Ground Water/Surface Water discharge point, and will be verified during remedial action activities. Long-term monitoring of the ground water is required to confirm the model and the assumptions used in the predictive model. Contingency plans will be developed and if necessary implemented to bring potential discharges back into compliance with the GSI criteria.

B. FATE AND TRANSPORT OF SITE-RELATED CONTAMINANTS

The ground water contamination in both the Western and Eastern Plumes consists primarily of VOCs (i.e., TCE, DCE, and vinyl chloride). U.S. EPA's Kerr Laboratory has attributed the occurrence of DCE and vinyl chloride to the natural anaerobic degradation of TCE.

U.S. EPA's Kerr Laboratory has conducted extensive evaluations of the conditions at the Bendix Site, and has indicated that the most important natural degradation mechanism is reductive dechlorination. This mechanism involves microbially catalyzed reactions caused by the replacement of chlorine atoms on the organic solvent molecules with hydrogen atoms. Reductive dechlorination of TCE results in the formation of daughter products, most significantly cis-1,2-DCE and vinyl chloride (Figure 5). Vinyl chloride, in turn, is degraded either aerobically or anaerobically to carbon dioxide or ethene, respectively.

All biodegradation reactions require an electron donor and an electron acceptor. In reductive dechlorination reactions, the contaminants (i.e., TCE, DCE) serve as electron acceptors rather than the primary food source (electron donor) for microbes. Thus, a primary organic substrate (food source) is necessary to serve as the electron donor for microbial energy and reproduction. A number of low molecular weight organic compounds can serve as electron donors. Data from the Bendix Site suggests that one source of the primary substrate (electron donors) used by anaerobic microorganisms to drive the dechlorination reactions originates from the former south lagoon. The low levels of soluble cutting oil residuals and other non-chlorinated organic compounds are being released into the ground water from the former south lagoon.

Reductive dechlorination of TCE and DCE leads to the production of vinyl chloride. Vinyl chloride is more readily treated in aerobic and iron-reducing conditions than in anaerobic conditions. The model for the destruction of TCE in both the Western and Eastern Plumes (see Figure 5) occurs in two steps:

Anaerobic reduction of TCE to cis-1,2-DCE, vinyl chloride, and finally to ethene.
Aerobic oxidation of any remaining vinyl chloride to carbon dioxide.

VII. SUMMARY OF SITE RISK

A Baseline Risk Assessment was conducted to evaluate potential risks from contaminant exposure at this facility, and determine the need for and extent of remediation. The complete Human Health Risk Assessment and the Ecological Risk Assessment is presented in Section 6.0 of the RI Report (W&C, 1997a). Risk assessment was conducted in accordance with U.S. EPA's guidance, including: "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation" (U.S. EPA, 1989a) and "Risk Assessment Guidance for Superfund: Volume II Environmental Evaluation Manual" (U.S. EPA, 1989b). These documents provide the methodology and standard assumptions used for evaluating risk and developing appropriate cleanup standards.

A. OBJECTIVES

The specific objectives of the baseline risk assessment for the Bendix Site facility are to provide:

- an evaluation of potential human health and ecological risks and a basis for determining the need, as required, for remedial action at this facility;
- a basis for determining the appropriate remedial target cleanup levels for contaminants in soils, ground water, sediments, and/or surface water, as necessary; and
- a basis for comparing the health impacts of various proposed remedial alternatives.

B. HUMAN HEALTH

The Human Health Risk Assessment for the Bendix Site is a quantitative evaluation, conducted in accordance with U.S. EPA and state guidance, and consists of the following components:

- Hazard Assessment;
- Exposure Assessment;
- Toxicity Assessment; and
- Risk Characterization.

The Human Health Risk Assessment for the Bendix Site indicates that the ground water contaminant concentrations present in the Eastern and Western Plumes result in carcinogenic and non-carcinogenic risk estimates greater than the U.S. EPA target risk range. Other media evaluated (i.e., site soils, surface water, and sediments) were below target risk ranges and are therefore not considered a potential risk.

1. Hazard Assessment

The objective of the Hazard Assessment is to identify the compounds of potential concern (CPCs) for each medium. Identification of CPCs are selected based on historical use at the Bendix Site, the frequency, spatial distribution, and magnitude of detection in each medium of concern, and comparison of detected concentrations to appropriate health/risk-based federal and state criteria. Table 1 presents identified CPCs for Bendix Site ground water including: frequency of detection; minimum, maximum, and average concentrations; and federal and state drinking water standards, as appropriate.

2. Exposure Assessment

The purpose of the Exposure Assessment is to estimate the type and magnitude of potential exposure to CPCs at or migrating from the Bendix Site based on site-specific conditions. Exposure is quantified by calculating exposure doses for each exposure scenario. Exposure doses are calculated based on the exposed populations, exposure point concentrations, and exposure pathways using the equations and default values presented in U.S. EPA and state guidance (U.S. EPA 1988, 1989a, 1991, and MDEQ 1996). Standard equations and exposure parameters used for estimating exposure doses, organized by exposure medium, exposure route, and population are presented as Table 6-6 of the RI (W&C, 1997a). The exposure assessment considers both current and future potential land uses to identify potentially exposed populations. The Bendix Site is currently used for industrial purposes, and it is expected that future uses will remain industrial. A significant portion of the Bendix Site consists of buildings and paved areas, and the property boundary is fenced. The Bendix Site slopes to the east towards Hickory Creek and rises slightly to the west towards Lake Michigan. Land use between the Bendix Site and Hickory Creek is industrial. Residences are present on the east (far) side of Hickory Creek. Land use between the Bendix Site and Lake Michigan is a

mixture of residential and commercial. City of St. Joseph municipal water is available in this area. Hickory Creek and Lake Michigan are used for recreational purposes. Table 2 presents a summary of the media evaluated, exposed population and complete exposure pathways.

3. Toxicity Assessment

The toxicity assessment provides information regarding the potential for a specific CPC to cause adverse effects in humans, and characterizes the relationship between the dose of a chemical and the incidence of adverse health effects in the exposed population. This assessment, therefore, identifies a dose-response value that can be used to quantitatively evaluate potential health risks as a function of chemical exposure.

Carcinogens

Carcinogenicity is quantified by the cancer slope factor (CSF). The CSF is U.S. EPA's upper-bound lifetime probability of an individual developing cancer as a result of a lifetime exposure to a carcinogen. CSFs are determined by U.S. EPA and published in an integrated risk information system (IRIS, 1995d), an on-line database for toxicity data, and health effects assessment summary tables (HEAST, 1994a). A summary of the oral dose-response information for carcinogenic effects, including the CSFs, for each CPC is provided in Table 6-13 of the RI report (W&C, 1997a).

Non-Carcinogens

Non-carcinogens are those compounds that cause an effect (e.g., liver damage) other than carcinogenicity. Carcinogens may also have non-carcinogenic effects; these effects are considered and included with the effects of non-carcinogenic compounds. In addition, non-carcinogenic compounds differ from carcinogens in that they are believed to have threshold dosage levels below which adverse effects are not expected. U.S. EPA's preferred criterion for quantifying non-carcinogenic risk is the reference dose (RfD), which corresponds to U.S. EPA's identification of the threshold effects level with an added margin of safety. The IRIS database maintains a current listing of all the verified RfDs, which are reported in units of mg/kg-day. By definition, the RfD is an estimate of an average daily exposure level below which significant, adverse non-carcinogenic health effects are not expected. Table 6-14 presented in the RI report presents the chronic RfDs and oral dose-response information for non-carcinogenic effects for each CPC. Toxicity profiles for the CPCs are available from the IRIS database.

4 Risk Characterization

The Risk Characterization integrates the quantitative exposure and toxicity values for each exposure scenario. Table 3 presents a summary of the quantitative summary of site risk.

Carcinogenic Effects

Carcinogenic risks are evaluated by multiplying the estimated exposure dose by the CSF to obtain an estimate of incremental risk, as follows:

$$\text{Carcinogenic Risk} = \text{Exposure Dose (mg/kg-day)} \times \text{CSF (mg/kg-day)}^{-1}$$

The cancer risks of each compound are summed within each exposure scenario. U.S. EPA's guidelines state that the total incremental carcinogenic risk for an individual resulting from exposure at a hazardous waste site should not exceed a target risk range of 1×10^{-6} to 1×10^{-4} (U.S. EPA 1990). In this risk assessment, the

estimated carcinogenic risk for each exposure scenario was compared to these values. If the estimated risk is below the acceptable range, no further action is recommended. If the estimated risk is within the acceptable range, the exposure scenario is reviewed to determine whether further actions are warranted, depending on where the estimated risks fall within that range. Further actions are recommended for estimated risks exceeding the upper end of the target risk range ($1x10^{-4}$).

Non-carcinogenic Effects

Non-carcinogenic effects are quantified in terms of a Hazard Index (HI), which is calculated by dividing the exposure dose by the RfD:

Hazard Index (HI) = Exposure Dose (mg/kg-day) / RfD (mg/kg-day)

Non-carcinogenic risks are evaluated by dividing the exposure dose of each compound by its respective RfD, and summing the resulting hazard index for each compound within each exposure scenario. The resulting cumulative non-carcinogenic risk for each exposure scenario was compared to the U.S. EPA target HI of 1. If the HI is less than or equal to 1, no adverse health effects are anticipated from the predicted exposure dose level. If the HI is greater than 1, the predicted exposure dose level could potentially cause adverse effects (U.S. EPA 1989a). Table 3 presents a summary of the carcinogenic and non-carcinogenic risk estimates for each exposure scenario.

5. Summary of Human Health Risk Assessment

Based on the Bendix Site conceptual model developed in the RI, five media at and surrounding the Bendix Site were identified as the focus of this assessment:

- Site soils;
- Eastern Ground Water Plume;
- Western Ground Water Plume;
- Hickory Creek surface water and sediments; and
- Lake Michigan surface water.

Site Soils

Based on the results of this risk assessment, no remedial action is necessary to protect human health due to contaminants present in subsurface site soils, given the current and foreseeable industrial land use. Contamination in site soils is limited to the Bosch property. A site-specific quantification of potential risks was calculated using a utility worker scenario. The estimated carcinogenic and non-carcinogenic risks were well below U.S. EPA target risk ranges. At each exposure point where a receptor may come into contact with known or potentially contaminated media, exposure point concentrations (EPCs) are determined for each CPC. To provide a range of risk estimates, the maximum and/or average (arithmetic mean) concentrations of the CPCs were used as the EPCs for each medium. The qualitative evaluation indicated that none of the EPCs exceeded the Draft MDEQ soil direct contact values or U.S. EPA residential soil screening level for lead. Furthermore, the EPCs did not exceed the MDEQ Volatile Soil Inhalation Criteria (MDEQ, April 1997) for potential commercial/industrial exposures due to the volatilization of VOCs from soil to air.

Eastern and Western Ground Water Plumes

The risk assessment indicates that the ground water contaminant concentrations present in the Eastern and

Western Plumes result in carcinogenic and non-carcinogenic risk estimates greater than the U.S. EPA target risk range, based on residential drinking water scenarios. Contamination in ground water is migrating off-site in the Eastern Plume (discharging to Hickory Creek) and Western Plume (discharging to Lake Michigan). Ground water in the area of the plant is identified as a potential future drinking water resource by the MDEQ. However this area is provided with municipal water. Future potential receptors were assumed to be residents using the ground water for drinking water. Potential drinking water exposure could be via ingestion, dermal contact, or inhalation of VOCs from ground water.

A site-specific quantification of potential risks was calculated for ground water from within both the Eastern and Western Plume areas using the residential drinking water scenario. The estimated carcinogenic and non-carcinogenic risks (using both maximum and average EPCs) exceeded the U.S. EPA target risk ranges for the Eastern Plume and the Western Plume. The results of the qualitative human health risk assessment indicate that the majority of the CPCs are at or above federal or state drinking water standards and/or other state screening criteria. These contaminants include vinyl chloride, 1,1-DCE, 1,2-DCE (total), TCE, cis-1,2-DCE, trans-1,2-DCE, 1,1,2-TCA, aluminum, arsenic, iron, manganese, and zinc in the Eastern Plume. In the Western Plume, the contaminants exceeding these criteria are vinyl chloride, 1,1-DCE, 1,2-DCE (total), TCE, 1,1,2-TCA, cis-1,2-DCE benzene, iron, manganese, zinc.

Hickory Creek

The results of this risk assessment indicate that no remedial action is necessary to protect human health due to contaminants present in Hickory Creek surface water and sediments.

Contaminated ground water from the Eastern Plume appears to discharge into Hickory Creek. Potential exposure points are surface water and sediments in the creek. Potential receptors were identified as children using the creek for recreational purposes. Potential exposure was evaluated as surface water ingestion/dermal contact, or sediment ingestion/dermal contact. A site-specific quantification of potential risks was calculated using a child recreational scenario. The estimated carcinogenic and non-carcinogenic risks were below the U.S. EPA target risk ranges.

The compounds in surface water were also qualitatively compared to drinking water criteria. No surface water CPCs exceeded drinking water standards, with the exception of high iron and manganese values, which are due to the high background values for these metals. No applicable standards or criteria are available to qualitatively evaluate exposure to sediments.

Lake Michigan

The results of this risk assessment indicate that no remedial action is necessary to protect human health due to the Western Plume discharging to Lake Michigan surface water.

Ground water from the Western Plume is discharging to Lake Michigan. Potential exposure points in the lake are surface water. No Plume-related chemicals were detected in the surface waters of Lake Michigan. However, to provide a conservative risk evaluation, concentrations of Plume-related chemicals measured in the Western Plume ground water were also compared to federal and state criteria. A dilution factor of 10 was applied to projected ground water concentrations based on the common dilution factor used by MDEQ for developing mixing zone based criteria for discharges to Lake Michigan. Potential receptors were identified as adults and children using the lake for recreational purposes (e.g. swimming). Potential exposure could be via surface water ingestion/dermal contact.

A site-specific quantification of potential risks was calculated using child and adult recreational scenarios. The estimated carcinogenic and non-carcinogenic risks were below the U.S. EPA target risk ranges. The results of the qualitative risk assessment indicate that none of the EPCs exceed federal/state health based drinking water standards.

C. ECOLOGICAL RISK ASSESSMENT

The objective of the Baseline Ecological Risk Assessment is to characterize the current and future potential ecological risks that may exist at the Bendix Site. This Ecological Assessment is based on a qualitative evaluation, by comparing reported concentrations with appropriate standards. An exposure assessment was conducted to determine ecologically sensitive areas that may be potentially impacted by the site contaminants. CPCs were selected for contaminated media in these areas. The EPCs were then compared to environmental screening criteria.

1. Exposure Assessment

The Bendix Site is industrial, consisting of pavement and buildings, and does not contain significant ecological habitats. Contaminated soils are located under pavement, buildings, or are capped, and are not directly accessible to ecological receptors. Ground water is located 25 to 30 feet below ground surface and is not accessible to ecological receptors. However, ground water discharges to two surface water bodies that are the subject of this ecological risk assessment.

The exposure assessment identifies ecologically sensitive areas as a result of the contamination at the Bendix Site. These include the areas where the Eastern Plume discharges to Hickory Creek and where the Western Plume discharges to Lake Michigan. Potential ecological receptors include the flora and fauna associated with Hickory Creek and Lake Michigan ecosystems.

Hickory Creek is located approximately one-third of a mile to the east of the plant, and is a perennial stream approximately 30 feet across and generally one to two feet deep. Hickory Creek water use is classified by MDEQ as suitable for agriculture, navigational, industrial water supply, public water supply at the point of intake, cold water fish, other indigenous aquatic life and wildlife, partial body contact recreation, and total body contact recreation from May through October (MDEQ Fact Sheet Permit No. MI0003174). Hickory Creek receives non-contact cooling water from the Bosch facility, as well as storm water runoff from the Bosch facility and the municipal storm water system. The confluence of Hickory Creek and St. Joseph River is approximately three miles to the north, with the St. Joseph River entering Lake Michigan approximately six miles downstream of the plant.

Lake Michigan is located approximately one-half mile to the west of the plant. The lake is used for recreational purposes, including swimming, fishing, and navigation, and is suitable for cold water fish and other indigenous aquatic life and wildlife.

2. Evaluation of Protected Species in the St. Joseph Area

Currently there is no available documentation that suggests that protected or endangered species are present within the area of the Bendix Site. The following is a summary of the Michigan Natural Features Inventory review of the Bendix Site conducted by the MDEQ: "there are no known occurrences of federal- or State-listed endangered, threatened or otherwise significant species, natural plant communities, or natural features at the location specified: Berrien County, T5S R19W, Sections 3,4,9,10."

3. Selection of Compounds of Potential Concern

CPCs and EPCs were selected for the surface water and sediments in Hickory Creek and surface water of Lake Michigan based on a review of the existing data base. The same CPCs identified in the human health risk assessment were retained as CPCs in the ecological risk assessment. The only compounds detected and eliminated from this evaluation were sodium, magnesium, and calcium (see Table 1). To provide a conservative estimate of risk, the EPC for each CPC was the maximum detected concentration.

4. Qualitative Ecological Risk Characterization

The qualitative assessment of potential risk to the environment consists of comparing the EPCs of each CPC for each media to applicable environmental screening criteria. Concentrations of Plume-related chemicals measured in Hickory Creek surface water were compared to the federal and state standards, as presented in Table 4. No Plume-related chemicals were reported from the surface water of Lake Michigan (Table 5). However, to provide a conservative risk evaluation, concentrations of Plume-related chemicals measured in the Western Plume ground water were also compared to federal and state criteria. A dilution factor of 10 was applied to projected ground water concentrations based on the common dilution factor used by MDEQ for developing mixing zone based criteria for discharges to Lake Michigan. The Criteria are:

- Federal Ambient Water Quality Criteria (AWQCs). These criteria are established by the U.S. EPA to be protective of aquatic organisms in surface water (U.S. EPA, 1986). Fresh water chronic and acute criteria are available for many of the CPCs.

- Michigan Ground Water/Surface Water Interface (GSI) values are criteria used to evaluate the potential impact of contaminated ground water venting to a surface water body. These criteria are developed by the state in accordance with Rule 323.1057 of Part 4 of Part 31 of the Natural Resources and Environmental Protection Act, 1994 PA 451 (Part 31). Under this act mixing zones may also be allowed. Mixing zone allowances for ground water are applied in the same manner as for point source discharges, except that no permit is required. However, like point source discharges, mixing-zone-based discharged criteria are calculated on a case by case basis in accordance with Part 31.

Contaminant concentrations measured in Hickory Creek sediments were compared to the following environmental criteria:

- Effects Range-Low (ER-L). The U.S. EPA screening guidelines include the ER-L for comparison of compounds detected in sediments. The ER-L value is the concentration equivalent to that calculated at the lower 10th percentile of the available, screened sediment toxicity data. As such, it represents the low end of the range of concentrations at which effects were observed.

- Apparent Effects Threshold (AET). The U.S. EPA screening guidelines include the AET values, which relate the chemical concentrations in sediments to at least one biological indicator of injury (e.g., sediment bioassays or altered benthic fauna abundance) to determine the concentration of the contaminant above which biological effects would always be expected.

Hickory Creek

Mixing zone-based GSI criteria were estimated using the MDEQ Interim Environmental Response Division

Operational Memorandum #17 dated April, 1996. Mixing zone based GSI criteria are exceeded in the existing ground water monitoring wells nearest Hickory Creek.

However, predictive modeling for the Eastern Plume indicates the Plume will comply with the mixing-zone-based GSI values as the Plume migrates and discharges to Hickory Creek. Because this is a prediction only, long-term monitoring of the Plume is required to ensure ground water does not vent to Hickory Creek above GSI criteria. If GSI criteria exceedances are predicted or detected through monitoring, contingency plans will be implemented to insure compliance with the GSI criteria.

The surface water quality for Hickory Creek also includes a requirement of 6 mg/l dissolved oxygen (DO) for cold water fish (R 323.1065, MDNR 1994). Based on the DO measurement collected during the surface water and sediment investigation (W&C 1996), the cold water fish requirement is satisfied. Surface water samples collected from Hickory Creek and Lake Michigan do not contain Plume-related contaminants that exceed federal Ambient Water Quality Criteria (U.S. EPA, 1986). The contaminant concentrations in Hickory Creek sediments are below the ER-L and AET criteria, indicating the CPC concentrations are below levels considered to have an effect on aquatic biota.

Lake Michigan

To evaluate the potential impact of the Western Plume on Lake Michigan, U.S. EPA Kerr Laboratory and the University of Michigan have completed several surface water and shallow ground water investigations along the interface of the Western Plume and Lake Michigan. The results of these investigations are summarized in Section 5.0 of the RI report (W&C, 1997a) and provide the basis for this ecological assessment.

Western Plume ground water is discharging to Lake Michigan. Concentrations of Plume-related contaminants detected in existing ground water monitoring wells nearest to Lake Michigan exceed estimated MDEQ GSI mixing zone-based values. However, predictive modeling for the Western Plume indicates the Plume will comply with the mixing-zone based GSI values as the Plume migrates and discharges to Lake Michigan. Long-term monitoring of the ground water is required to ensure ground water does not vent to Lake Michigan above GSI criteria. If GSI criteria exceedances are predicted or detected through monitoring, contingency plans will be implemented to insure compliance with the GSI criteria.

5. Summary of Ecological Risk Assessment

Based on this qualitative assessment, the Ecological Risk Assessment concludes that the contaminant concentrations in Hickory Creek and Lake Michigan surface water and sediments do not pose a significant threat to the environment. Estimated GSI mixing zone based criteria are exceeded in monitoring wells near Hickory Creek and Lake Michigan. Predictive modeling for the Plumes venting to Lake Michigan and Hickory Creek indicates the Plumes will comply with the mixing-zone based GSI criteria at the Ground Water/Surface Water discharge points. Long term monitoring will be required to evaluate the remedy and demonstrate compliance with GSI criteria. Contingency plans will be implemented in a timely manner in the event monitoring indicates GSI exceedences are predicted or have occurred.

VIII. DESCRIPTION OF ALTERNATIVES

Twenty six potential remedial technologies were identified in the FS (Table 3-1 of FS). Six options were retained for detailed analysis of the Western Plume, and eight options were retained for detailed analysis of

the Eastern Plume. These alternatives range from No Action (used as a baseline to compare with the other alternatives) to containment to permanent treatment. Four alternatives were selected for the Proposed Plan and are discussed below. Detailed descriptions of each alternative can be found in Section 6.0 of the FS report.

A. ALTERNATIVE 1 - NO ACTION

This alternative was developed and evaluated in the FS to serve as a baseline with which to compare the other remedial alternatives. For the No Action Alternative, no institutional controls would be implemented and no remedial actions would be conducted. This alternative would not implement institutional controls to prevent the potential for future exposure to contaminated ground water and would not include remedial action statutory and regulatory requirements to reduce ground water VOC concentrations to drinking water standards.

Ground water flow modeling was conducted to estimate remedial time frames for the Eastern and Western Plumes. The limiting factor associated with meeting drinking water standards throughout the aquifer is the dissolution of inferred source material to the dissolved phase in ground water. Based on the current natural attenuation processes occurring in the Plumes, it is estimated that it will take approximately 150 to 250 years for chlorinated VOCs to be degraded to drinking water standards throughout the aquifer. This estimate assumes that active remedial activities would not be conducted for the Eastern and Western Plume inferred source areas.

A detailed discussion of the ground water flow modeling used to estimate the remedial time line frames is presented in Appendix A of the FS report.

Estimated Time to Design and Construct = No remedial activities required
Estimated Remedial Time Frame = 150 to 250 years
Estimated Capital Cost = $0
Estimated Operation and Maintenance Costs (net present worth) = $0
Estimated Total Cost (net present worth) = $0

B. ALTERNATIVE 2 - GROUND WATER INSTITUTIONAL CONTROLS AND DEED RESTRICTIONS, SOIL VAPOR EXTRACTION (SVE) TREATMENT OF THE EASTERN Plume SOURCE AREA, SOURCE CONTAINMENT OF WESTERN Plume, TREATMENT WITHIN THE CONTAINMENT SYSTEM, AND MONITORED NATURAL ATTENUATION (EASTERN AND WESTERN PlumeS), WITH PROTECTIVE CONTINGENCIES

This alternative would consist of the following components:

- Environmental Monitoring
- Institutional Controls
- Natural Attenuation of Dissolved Plumes
- Five-year Site Reviews

Eastern Plume Source Area

- Maintenance of Existing Cover System
- Operation of SVE System to remove volatile contaminants from the vadose zone
- Installation of SVE Vapor Phase Treatment System

Western Plume Source Containment

- Installation of Low Permeability Barrier System
- Installation of Ground Water Extraction System
- Installation and Operation of Ground Water Treatment System within Low Permeability Barrier System
- Discharge of Treated Ground Water

1. Environmental Monitoring

Environmental monitoring will be used to evaluate (1) the effectiveness of natural attenuation processes in the Plume, (2) the subsurface microbial environment, (3) compliance with appropriate MDEQ GSI criteria, and (4) evaluating the change in risks to human health and the environment over time. Environmental monitoring will consist of routine periodic sampling and analysis of ground water and Lake Michigan and Hickory Creek surface water.

Contaminated ground water discharging to Hickory Creek and Lake Michigan will be monitored at the POC and at sentinel wells within the ground water Plumes. The protection criteria for the POC will be the more restrictive of either the contaminant concentrations found during the monitoring well installation, as a baseline value, or the calculated GSI mixing zone-based value. POC wells will be installed in the ground water Plumes as close to Hickory Creek and Lake Michigan as possible where ground water gradients demonstrate movement toward the creek and the lake.

Sentinel wells are to be located in the Plumes between the inferred source areas and the POC. Sentinel wells are used to predict or provide early warning of potential exceedances of POC criteria and to monitor the effectiveness of the remedy to reduce the level of contaminants within the Plume.

The details of establishing progress toward aquifer restoration will be developed in the Long Range Monitoring Plan in the Statement of Work and will be based on mathematical projections showing the projected/actual change in the ground water concentrations over time. The individual contaminants, and the cumulative risk posed by these contaminants, will be evaluated at each monitoring event to establish the trend (improving or deteriorating) of the ground water restoration. Least square fit and linear regression analysis are two mathematical approaches that can be used to show these trends. A contingency plan will be provided in the Long-Term Monitoring Plan and will be implemented to protect human health and the environment if environmental monitoring predicts or detects exceedences of POC criteria. For mathematical trends that predict POC exceedences this plan will require an evaluation of the impacts of the exceedence, potentially leading to increased monitoring, or the implementation of one of the ground water control measures identified in the FS, or other suitable methods, to prevent further release of contaminants to the surface water body. These measures may include: ground water pump-and-treat (either on site or off-site); ground water bioventing and/or biosparging; enhanced biodegradation of contaminants in the Plume; in-well stripping; a combination of these procedures; or other technology advanced by the PRPs and approved by

the U.S. EPA, in consultation with MDEQ, felt suitable for remediation. For confirmed, statistically significant exceedances of contaminants above the established values at the POC, the contingency plan will require the implementation of additional ground water control measures, as indicated above, to prevent further release of contaminants to the surface water body.

The remedial action will be continued until the Eastern and Western Plumes have been restored to drinking water standards throughout the Plumes.

2. Institutional Controls

Institutional controls in the form of deed and land use restrictions will be implemented to (1) restrict/control utility and maintenance work in the vicinity of the loading dock (Eastern Plume source area) and former south lagoon to minimize potential future human health risks associated with site-related contaminants in vadose zone soils and (2) prohibit the potential future use of Eastern and Western Plume ground water on- and off-site.

3. Natural Attenuation

This alternative includes Natural Attenuation for control and remediation of VOCs in the Eastern and Western Plumes. Studies have indicated that biodegradation is occurring within the Western Plume at a rate of approximately 600 pounds per year. Natural Attenuation is providing active treatment of VOCs in the Plumes. The containment barrier would effectively isolate the Western Plume inferred source area. The slurry wall would restrict dissolution and natural attenuation of the inferred source, resulting in a 400 year estimated remedial time. Estimated remediation time for the Eastern Plume would be the same as the No Action Alternative (150 to 250 years).

4. Five-Year Site Reviews

Five-year site reviews consisting of ground water and surface water sampling at least once every five years will be conducted to assess the impacts of contaminants to ground water, Lake Michigan and Hickory Creek surface water, and to evaluate potential risks to human health and the environment, until the ground water had been restored to drinking water standards.

5 Eastern Plume Source Area

A SVE system will be designed, installed and operated to control/reduce VOCs in vadose zone soils above the ground water (Eastern Plume and source area). This will reduce the mass of source material that is contaminating the ground water, reduce the concentration of volatile contaminants in the vadose zone, and reduce the time to achieve drinking water standards in the Eastern Plume. The extracted VOCs will be oxidized and vented to the atmosphere. The VOC treatment system will be monitored to ensure compliance with state and federal emission requirements.

6 Western Plume Source Containment

Under this alternative, a containment wall (i.e., slurry wall) approximately 1,260 feet long and 100 feet deep, would be installed around the deep inferred source of the Western Plume to reduce the mobility of contaminants and the volume of upgradient ground water contacting this inferred source. A Ground water Extraction System would be installed to achieve hydraulic containment within the low permeability barrier system and to collect contaminated ground water from within the barrier for treatment. The ground water

treatment system would be designed to reduce the influent concentrations to drinking water standards. The FS evaluated the following ground water treatment system: pretreatment to remove inorganics, iron and manganese oxidation, UV-oxidation, residual peroxide reduction, treated water disposal, sludge thickening, and sludge dewatering.

The FS evaluated ground water reinjection/reinfiltration (e.g., reinfiltration pond, tile field, wells) and surface water discharge options. The surface water discharge option assumed Hickory Creek to be the receiving stream because the local publicly-owned treatment works will only accept treated ground water on a temporary basis. The Bendix Site currently has a permit to discharge non-contact cooling water and storm water to Hickory Creek.

Residual risks would remain at the Bendix Site from contaminants in ground water in the remainder of the Western Plume. Institutional Controls would restrict the potential future access to and use of ground water, thereby eliminating this exposure pathway as a source of residual risk.

Estimated Time to Design and Construct = 2 years
Estimated Remedial Time Frame: Eastern Plume = 150 to 250 years
Estimated Remedial Time Frame: Western Plume = 150 to 400 years
Total Capital Costs = $10,553,000
Total Operation and Maintenance Costs (net present worth)= $4,963,000
Total Costs (net present worth) = $15,516,000

C. ALTERNATIVE 3 - GROUND WATER INSTITUTIONAL CONTROLS AND DEED RESTRICTIONS, SOIL VAPOR EXTRACTION TREATMENT (EASTERN Plume INFERRED SOURCE REMOVAL), MONITORED NATURAL ATTENUATION (EASTERN AND WESTERN PlumeS), WITH PROTECTIVE CONTINGENCIES

This alternative will consist of the following components:

- Environmental Monitoring
- Institutional Controls
- Natural Attenuation of Dissolved Plumes
- Five-year Site Reviews

Eastern Plume Source Area

- Maintenance of Existing Cover System
- Operation of SVE System to remove volatile contaminants from the vadose zone
- Installation of SVE Vapor Phase Treatment System

The components of Alternative 3 are the same as described for Alternative 2 except that Alternative 3 does not include the Western Plume Source Containment components. For Alternative 3, the estimated remediation time for the Eastern Plume is 150 to 200 years. This is slightly lower than Alternatives 1 and 2 (150 to 250 years) because the SVE treatment system will reduce the mass of inferred source contaminants, thereby reducing the time required to restore the aquifer to drinking water standards.

Estimated remediation time for the Western Plume is the same as Alternative 1 (estimated remediation time is 150 to 250 years). This is significantly lower than Alternative 2 (remediation time up to 400 years)

because the Western Plume containment barrier would not be installed.

Estimated Time to Design and Construct = 2 months
Estimated Remedial Time Frame: Eastern Plume = 150 to 200 years
Estimated Remedial Time Frame: Western Plume = 150 to 250 years
Total Capital Costs = $756,000
Total Operation and Maintenance Costs (net present worth)= $3,412,000
Total Costs (net present worth) = $4,168,000

D. ALTERNATIVE 4 - GROUND WATER INSTITUTIONAL CONTROLS AND DEED RESTRICTIONS, MONITORED NATURAL ATTENUATION (EASTERN AND WESTERN PlumeS), WITH PROTECTIVE CONTINGENCIES

This alternative would consist of the following components:

- Environmental Monitoring
- Institutional Controls
- Natural Attenuation of Dissolved Plumes
- Five-year Site Reviews
- Eastern Plume Source Area -Maintenance of Existing Cover System

The components of Alternative 4 are the same as the components for Alternative 2 except that Alternative 4 does not include the Eastern Plume source area SVE system or the Western Plume containment system. Each of the Alternative 4 components are described in Part B of this Section (see Alternative 2).

Alternative 4 includes maintenance and/or repair of the asphalt and concrete cover system that currently exists over the inferred Eastern Plume source area. This will reduce the potential flushing of source material into the ground water beneath the Bendix Site, and reduce potential access/direct contact to these soils by on-site workers.

Because Alternative 4 includes natural attenuation of the Eastern and Western Plumes, the estimated remediation time is the same as Alternative 1 (150 to 250 years).

Estimated Time to Design and Construct = Readily implementable
Estimated Remedial Time Frame = 150 to 250 years
Total Capital Costs = $624,000
Total Operation and Maintenance Costs (net present worth) = $2,270,000
Total Costs (net present worth) = $2,894,000

IX. SUMMARY OF THE COMPARATIVE ANALYSIS OF ALTERNATIVES

The relative performance of each remedial alternative was evaluated in the FS using the nine criteria set forth in the NCP at 40 CFR Section 300.430. A remedial action providing the "best balance" of trade-offs with respect to the nine criteria is determined from this evaluation.

A. THRESHOLD CRITERIA

1. **Overall protection of human health and the environment** addresses whether or not a remedy provides adequate protection and describes how risks posed through each pathway are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

2. **Compliance with ARARs** describes how the alternative complies with chemical-, location-, and action-specific ARARs, or other criteria, advisories, and guidance.

B. PRIMARY BALANCING CRITERIA

The following five criteria are used to compare and evaluate the elements of one alternative to another that meet the threshold criteria.

1. **Long-term effectiveness and permanence** evaluates the effectiveness of alternatives in protecting human health and the environment after response objectives have been met, in terms of the magnitude of residual risk and the adequacy and reliability of controls.

2. **Reduction in toxicity, mobility, or volume through treatment** evaluates the treatment technologies by the degree of expected reduction in toxicity, mobility, or volume of hazardous material. This criterion also evaluates the irreversibility of the treatment process and the type and quantity of residuals remaining after treatment.

3. **Short-term effectiveness** addresses the period of time needed to achieve protection and any adverse impacts on human health and the environment that may be posed during the construction and implementation period, until the remedial action objectives are achieved.

4. **Implementability** assesses the ability to construct and operate the technology; the reliability of the technology; the ease of undertaking additional remedial actions; and the ability to monitor the effectiveness of the remedy. Administrative feasibility is addressed in terms of the ability to obtain approvals from other agencies. This criterion also evaluates the availability of required resources, such as equipment, facilities, specialists, and capacity.

5. **Cost** evaluates the capital and operation and maintenance costs of each alternative, and provides an estimate of the total present worth cost of each alternative.

C. MODIFYING CRITERIA

The modifying criteria are used in the final evaluation of remedial alternatives after public comment on the RI/FS and Proposed Plan has been received.

1. **State acceptance** addresses whether, based on its review of the RI/FS and Proposed Plan, the state concurs with, opposes, or has no comment on the proposed remedial alternative.

   The State of Michigan has provided comments on the RI/FS and the Proposed Plan and has documented its concurrence with the remedial action in its letter of concurrence, and upon receipt, will be presented in Appendix A.

2. **Community acceptance addresses whether the public concurs with the Proposed Plan.** Community acceptance of the Proposed Plan was evaluated based on comments received at the Public Meeting and during the public comment period. This is documented in the Responsiveness Summary presented in Appendix C.

The section below presents the nine criteria and a brief summary of each alternative and its strengths and weaknesses according to the detailed and comparative analyses.

Overall Protection of Human Health and the Environment

Site conditions currently pose no risks to human health and the environment. However, the potential exists for future human health risks associated with exposure to ground water. Alternative 3 will reduce contaminant concentrations in ground water to levels protective of human health risk. Alternative 3 also includes source control of the Eastern Plume which will reduce the time required to achieve drinking water standards. Alternatives 1 and 4 will reduce contaminant concentrations in ground water over time to levels that would reduce human health risk. Containment associated with Alternative 2 would isolate the Western Plume source which could significantly increase the time required to meet drinking water standards.

Compliance with Applicable or Relevant and Appropriate Requirements

The alternatives will comply with chemical-specific ARARs over time (i.e., when drinking water standards are achieved). Location- and action-specific ARARs will not apply to Alternatives 1 and 4 because remedial activities will not be conducted. The other alternatives will be designed to meet location- and action-specific ARARs.

Long-term Effectiveness and Permanence

Alternative 3 and Alternative 4 will provide effective and permanent treatment over time by allowing the natural degradation processes occurring in the Eastern and Western Plumes to continue until drinking water standards are achieved. If the Western Plume inferred source area can be located, Alternative 2 would minimize the migration of ground water contaminants via containment. However, Alternative 2 would only be effective if the barrier is installed around the actual Western Plume source area (which has not been directly observed or sampled to date). Additional studies would be required to locate this source. Alternatives 2 and 3 would also minimize potential exposure to on-site workers associated with Eastern Plume vadose zone soils via SVE treatment. The No Action alternative would not include institutional controls to prevent the potential future human health risks associated with exposure to ground water.

Reduction in Toxicity, Mobility, or Volume through Treatment

Natural Attenuation appears to be effectively controlling the spread of the Eastern and Western Plumes. Alternative 3 will decrease the volume of contaminants within the Eastern Plume source area via SVE treatment and natural attenuation processes will reduce the toxicity of chemicals in both Plumes. Natural biodegradation processes associated with the No Action and Natural Attenuation alternatives (Alternatives 1 and 4) will reduce the toxicity of ground water contaminants via natural biodegradation processes occurring within the Plume. However, these alternatives would not provide containment/control of contaminants in Eastern Plume source area vadose zone soils. However, this would also restrict dissolution and biodegradation of the source material, resulting

in a significant increase in time to achieve drinking water standards.

Short-term Effectiveness

Alternatives 1, 3, and 4 will have no adverse effects to the community or the environment.

Implementability

The No Action and Natural Attenuation alternatives (Alternatives 1 and 4) would be readily implementable because no remedial activities would be required. Alternative 3 could be implemented in approximately two (2) months. Pilot-scale testing will be required to evaluate and optimize the SVE system associated with the selected alternative. The containment barrier associated with Alternative 2 would be difficult to install because (1) the specific location of the source is uncertain and (2) it would have to be set 90 to 100 feet below ground surface adjacent to existing structures and utilities. Alternative 2 would require approximately two (2) years to implement.

Cost

The capital, operation and maintenance costs, and net present worth costs are presented for each alternative in the Description of Alternatives (Section VIII). The No Action alternative is the least costly of the alternatives. Alternative 3 is less costly than Alternative 2 because it utilizes the natural attenuation processes within the Plume and does not require the installation of a deep containment barrier. The selected remedy is more costly than Alternative 4 (Natural Attenuation) because it includes using the SVE system to promote source control of the Eastern Plume to reduce the volume of contaminants contributing to ground water contamination.

State Acceptance

The State of Michigan has provided comments on the FS and the Proposed Plan and has documented its concurrence with the remedial action as stated in Section XIII. Upon receipt, a copy of the State's letter of concurrence will be included as Appendix A.

Community Acceptance

Community acceptance of the Proposed Plan was evaluated based on comments received at the Public Meeting and during the public comment period. There were only a few comments concerning the Proposed Plan. There was no opposition raised to the Selected Remedy. This is documented in the Responsiveness Summary presented in Appendix C.

X. THE SELECTED REMEDY

U.S. EPA has selected Alternative 3 as the remedy for the Bendix Superfund Site. Alternative 3 addresses ground water and source areas associated with the Western and Eastern Plumes. Alternative 3 includes:

Alternative 3 - Ground Water Institutional Controls and Deed Restrictions, Soil Vapor Extraction Treatment (Eastern Plume inferred source and vadose contamination removal), and Monitored Natural Attenuation (Eastern and Western Plume), with protective contingencies.

U.S. EPA and MDEQ have determined that the selected remedy provides the best compliance with the nine criteria. The selected remedy meets the requirements of CERCLA and has received favorable public comment.

A. CLEANUP LEVELS

Drinking water standards were selected as cleanup levels for the Bendix Site based on the results of the baseline risk assessment and set at the more stringent federal or state promulgated drinking water standards, or derived as a health-based standard where no MCL is available. This approach is consistent with the NCP that defines acceptable exposure for noncarcinogens as a Hazard Index (HI) equal to 1 and carcinogenic risk between 10^{-4} to 10^{-6}. Therefore, a noncarcinogenic HI less than 1 (e.g., 0.8) or a carcinogenic risk less than 10^{-6} (e.g., 10^{-7}) is considered to be protective of human health.

The results of the baseline risk assessment indicate that potential future exposure to ground-water results in an unacceptable "exposure level" to human health. Compounds are present at concentrations associated with a noncarcinogenic risk greater than an HI equal to 1 and/or carcinogenic risk greater than 10^{-4}. The data used to evaluate potential future risks from ground water exposure are discussed in Section 6.0 of the RI. The selection of compound-specific drinking water standards is discussed separately for the Western and Eastern Plumes.

1. Western Plume

Six organic compounds (vinyl chloride, 1,1-DCE, TCE, 1,1,2-TCA, benzene, and 1,2-DCE) are present at concentrations associated with elevated risk estimates. Exposure to these compounds accounts for 100 percent of the baseline carcinogenic risk and 99.9 percent of the baseline noncarcinogenic risks. These compounds are listed in Table 7 with the frequency and range of detection, federal MCL and state drinking water standard (DWS) concentrations, and frequency at which each compound was detected at concentrations in excess of the federal MCL/state DWS.

Three of the six compounds listed in Table 7 (vinyl chloride, 1,2-DCE [total], and TCE) are present at elevated concentrations in multiple locations within the Western Plume ground water and are identified as the CPCs. Drinking water standards are proposed as cleanup levels for each of these compounds (see Table 7). The cleanup levels for these compounds were set at federal MCLs, which are the same concentrations as the state DWSs. Remedial actions taken to reduce exposure to or concentration of these compounds will result in a concurrent reduction of exposure to other compounds present in the ground water.

2. Eastern Plume

Six compounds (vinyl chloride, 1,1-DCE, TCE, 1,2-DCE, arsenic, and manganese) are present at concentrations associated with elevated risk estimates. Exposure to these compounds accounts for 100 percent of the carcinogenic risk and 99.9 percent of the noncarcinogenic risks. These compounds are listed in Table 8 with the frequency and range of detection, federal and state drinking water standard concentrations, and frequency at which each compound was detected at concentrations in excess of the federal MCL/state DWS.

Four of the six compounds listed in Table 8 (vinyl chloride, 1,1-DCE, 1,2-DCE [total], and TCE) are present at elevated concentrations in multiple locations within the Eastern Plume ground water and are identified as the CPCs. Cleanup levels are proposed for each of these compounds and were set at federal MCLs (see

Table 8). State drinking water standards for these compounds are the same concentrations as the MCL.

B. DESCRIPTION OF REMEDIAL COMPONENTS

The selected remedial alternative for the Eastern and Western Plumes and their source areas acknowledges the natural biodegradation processes occurring within the Plumes. Environmental monitoring will be conducted to evaluate the continued effectiveness of natural attenuation processes and institutional controls will be implemented to protect public health by restricting future use of ground water. This alternative includes the following components:

- Environmental Monitoring with protective contingency plans;
- Institutional Controls;
- Natural Attenuation of Dissolved Plumes;
- Five-year Site Reviews;
- Eastern Plume Source Area-Maintenance of Existing Cover System;
- Eastern Plume Source Area-Operation of SVE System; and
- Eastern Plume Source Area-Installation of SVE Vapor Phase Treatment System.

1. Environmental Monitoring

Environmental monitoring will be used to evaluate (1) the effectiveness of natural attenuation processes in the Plume, (2) the subsurface microbial environment, (3) compliance with appropriate MDEQ GSI criteria, and (4) the change in risks to human health and the environment over time. Environmental monitoring will consist of routine periodic sampling and analysis of ground water and Lake Michigan and Hickory Creek surface water.

Contaminated ground water discharging to Hickory Creek and Lake Michigan will be monitored at the POC and at sentinel wells within the ground water Plumes. The protection criteria for the POC will be the more restrictive of either the contaminant concentrations found during the monitoring well installation (baseline value), or the calculated GSI mixing zone-based value. POC wells will be installed in the ground water Plumes as close to Hickory Creek and Lake Michigan as possible where ground water gradients demonstrate movement toward the creek and the lake.

Sentinel wells are to be located in the Plumes between the inferred source areas and the POC. Sentinel wells are used to predict or provide early warning of potential exceedances of POC criteria and to monitor the effectiveness of the remedy in reducing the level of contaminants within the Plume.

The details of establishing progress toward aquifer restoration will be developed in the Long Range Monitoring Plan in the Statement of Work and will be based on mathematical projections showing the projected/actual change in the ground water concentrations over time. The individual contaminants, and the cumulative risk posed by these contaminants, will be evaluated at each monitoring event to establish the trend (improving or deteriorating) of the ground water restoration. Least square fit and linear regression analysis are two mathematical approaches that can be used to show these trends. A contingency plan will be provided in the Long-Term Monitoring Plan and will be implemented to protect human health and the environment if environmental monitoring predicts or detects exceedences of POC criteria. For mathematical trends that predict POC exceedences this plan will require an evaluation of the impacts of the exceedence, potentially leading to increased monitoring, or the implementation of one of the ground water control measures identified in the FS, or other suitable methods, to prevent further release of contaminants to the

surface water body. These measures may include: ground water pump-and-treat (either on site or off-site); ground water bioventing and/or biosparging; enhanced biodegradation of contaminants in the Plume; in-well stripping; a combination of these procedures; or other technology and approved by the U.S. EPA, in consultation with MDEQ, felt suitable for remediation. For confirmed, statistically significant exceedances of contaminants above the established values at the POC, the contingency plan will require the implementation of additional ground water control measures, as indicated above, to prevent further release of contaminants to the surface water body

The remedial action will be continued until the Eastern and Western Plumes have been restored to drinking water standards.

2. Institutional Controls

Institutional controls in the form of deed and land use restrictions will be implemented to prohibit ground water use associated with the Eastern and Western Plumes both on- and off-site. Institutional controls will be drafted, implemented, and enforced in cooperation with adjacent property owners and the federal, state, and local governments.

3. Natural Attenuation

The selected remedial alternative includes natural attenuation for treatment of site-related VOCs (i.e., TCE, 1,2-DCE, and vinyl chloride) in Eastern and Western Plume ground water. U.S. EPA Kerr Laboratory has concluded that the most important natural attenuation mechanism at the Bendix Site is biological reductive dechlorination (Wilson et al., 1996, Weaver et al., 1996a, and Weaver et al., 1996b). Based on environmental data collected to date, natural attenuation is providing active treatment of chlorinated organics in the Western Plume. TCE is degraded to DCE, which is then degraded to vinyl chloride in the strongly reducing, anaerobic conditions within the Plume. Vinyl chloride is degraded to either ethene or carbon dioxide, depending on the subsurface conditions (either anaerobic or aerobic, respectively). By the time the Plume reaches the Lake Michigan beach front, much of the chlorinated mass has been degraded to ethene.

Extensive site characterization data indicate that natural attenuation is effectively containing the spread of contamination by reducing contaminant concentrations. Natural attenuation is an appropriate remediation method only where it is fully protective of human health and the environment, and where it can be demonstrated capable of achieving site-specific remediation objectives (e.g., drinking water standards) within a reasonable time frame. The NCP states that remediation time frame for restoring ground water to its beneficial use should be developed based on specific site conditions. Under these natural attenuation processes, the time to achieve drinking water standards is estimated to be between approximately 150 to 250 years. County well permit regulations preclude the use of this aquifer for residential use, and the time frame projections shown are reasonable given this site specific circumstance.

4 Five-year Site Reviews

Under CERCLA Section 121(c), a remedial action that results in hazardous wastes, pollutants, or contaminants remaining on site should be reviewed every five years. Data collected during the monitoring program will be used to assess potential impacts of contaminants, and evaluate whether human health and the environment continue to be protected by the alternative

5. Eastern Plume Source Area - Existing Cover System

The cover system above the Eastern Plume source area consists of asphalt, concrete slab, and existing buildings. The cover system will be visually inspected annually and repaired as necessary (e.g., resurfaced, patched). This cover system will continue to minimize infiltration to vadose zone soils, thereby reducing the amount of contaminants released to ground water, and will also reduce potential access/direct contact to these soils by on-site workers.

6. Eastern Plume Source Area - Operation of SVE System

The SVE treatment system is an in situ vadose zone treatment technology that operates via application of a vacuum to promote vapor flow through the vadose zone. Contaminants will volatilize from soil and be swept by air flow to air extraction wells located throughout the contaminated area. Extracted air will be treated using photocatalytic oxidation to achieve air emission requirements.

C. LONG TERM MONITORING PLAN

The Long-Term Monitoring Plan will present specific details of the long-term sampling and analysis requirements for compliance monitoring of air emissions, surface water, and ground water as required by the selected remedy for the Bendix Site. This plan will present the location of each sampling point, sampling protocol, analytical method, analytical level, data evaluation level employed for each sampling location during the long-term monitoring phase of the remedial action. The Long-Term Monitoring Plan will also present the method used to determine what constitutes an exceedence or projected exceedence, when and what action(s) (contingencies) will be taken to protect human health and the environment if exceedences are reported above determined action levels.

XI. STATUTORY DETERMINATIONS

The selected remedy for the Bendix Site is consistent with CERCLA and in compliance with the NCPto the extent practicable. The selected remedy is protective of human health and the environment, attains ARARs, and is cost-effective. The selected remedy also satisfies the statutory preference for treatment that permanently and significantly reduces the toxicity, mobility, or volume of hazardous substances as a principal element. The following describes how the selected remedy meets these requirements.

A. THE SELECTED REMEDY IS PROTECTIVE OF HUMAN HEALTH AND THE ENVIRONMENT

The selected remedy will provide adequate protection of human health and the environment through institutional controls to prevent exposures to ground water and through the treatment technologies to be employed. The potential future risks associated with access to/use of site ground water will decrease over time because Natural Attenuation will reduce the concentration of contaminants to the drinking water standards listed in Table 1.

B. THE SELECTED REMEDY ATTAINS ARARs

The selected remedy will comply with identified federal and state ARARs. Potential chemical-and location-specific ARARs were identified, defined, and summarized in Section 7.0 of the RI report. Potential action-specific ARARs were identified in Section 2.0 of the FS report.

Table 9 presents the chemical-specific ARARs for the selected remedy. Because remedial actions will not impact natural resources (e.g., wetland areas), location-specific ARARs do not apply to the selected remedy. Action-specific ARARs for the Eastern Plume remedial activities are listed in Table 9. Activities associated with the selected remedy will be conducted according to regulations outlined by OSHA.

A brief narrative of significant chemical- and action-specific ARARs, and other criteria, follows.

1. Water Regulations

Chemical-specific ARARs for site ground water include regulations and criteria promulgated under the Safe Drinking Water Act (SDWA), Clean Water Act, and State of Michigan statutes. In addition, certain other numerical goals will be attained. The federal National Drinking Water Regulations consist of contaminant-specific standards known as MCLs and Maximum Contaminant Level Goals (MCLGs). MCLs are enforceable standards that are the maximum permissible level for specific contaminants in public water supplies. MCLGs are non-enforceable health-based goals that establish levels at which no known or anticipated adverse health effects occur. The NCP, 300.430(e)(2)(I)(B) and (C), requires that MCLGs above zero, and MCLs, be attained for ground water sources that are current or potential sources of drinking water.

Under the Michigan Drinking Water Rules, the state adopted federal MCLs. Because ground water associated with the Bendix Site is potentially a drinking water source, MCLs are not applicable at the site, but they are relevant and appropriate. In developing the cleanup levels, the Risk Assessment compared ground water contaminant concentrations with federal MCLs, Michigan drinking water standards, and Michigan aesthetic drinking water values. Cleanup levels were set at MCLs. Michigan drinking water standards adopted federal MCLs. The selected remedy will be complete when drinking water standards have been achieved in the ground water Plumes.

Part 201 (Environmental Remediation) of the Michigan Natural Resources and Environmental Protection Act of 1994 (Public Act 451) is applicable to the selected remedy and specifies rules for establishing risk-based cleanup criteria for a site. If risk-based cleanup criteria established for ground water under this rule differ from (a) the state drinking water standard, or (b) criteria for adverse aesthetic characteristics, the cleanup criteria for the site will be the more stringent of (a) or (b) unless use of the aquifer is restricted. The Bendix Site aquifer will also be restricted by implementing institutional controls and deed restrictions.

Under Rule 323 1057 of Part 4 of Part 31 of the Natrual Resources and Environmental Protection Act, 1994, as amended, PA 451of the National Toxics Rule (NTR, Federal Register, December 22, 1992, VOL. 57(246): 60848-60923) Ground Water Surface Water (GSI) criteria have been identified as goals for the selected remedy. These GSI criteria identify the maximum ground water contaminant discharge to surface water. The final GSI value is the more restrictive of the Rule 57 value and the NTR value, where both are available (excluding arsenic whose GSI value is the Rule 57 value). Under the 1995 amendments to Part 31, mixing zones for ground water venting to a surface water body are allowed. Mixing zone determinations and discharge criteria are developed on a case by case basis in accordance with Part 31.

2. Air Regulations

The Clean Air Act provides primary and secondary air quality standards to protect human health from known or anticipated adverse effects of pollutants. The Michigan Air Pollution Control Act (Act No. 348) and Part 55 of Michigan Public Act 451 (Air Pollution Control) contain contaminant-specific regulations that pertain to allowable emissions of pollutants from various air containment source categories and processes. These requirements are applicable to the selected remedy because the SVE treatment system associated with the

Eastern Plume will produce VOC emissions. The SVE off-gas treatment system will be monitored on a monthly basis to ensure compliance with state and federal permitting and emission requirements.

C. THE SELECTED REMEDY IS COST-EFFECTIVE

The remedy provides overall effectiveness proportionate to its cost. The estimated costs associated with this remedy are:

- Capital Cost: $ 756,000
- Operation and Maintenance Costs (net present worth): $3,412,000
- Total Cost (net present worth): $4,168,000

Alternative 3 is considered cost-effective because it takes advantage of the natural attenuation processes occurring in the Plumes. The remedy provides protection against the potential for future human health risks associated with exposure to site ground water. Major capital costs associated with the selected remedy include well installation for long-term monitoring, and legal and engineering support associated with implementing institutional controls. Major operation and maintenance costs include the five year site reviews and operation and maintenance of the SVE system.

The No Action alternative is less costly, but it would not provide protection from the potential future risks associated with ground water exposure. Alternative 4 (Natural Attenuation) is less costly than the selected remedy. However, the selected remedy utilizes the SVE treatment system to reduce the concentration of VOCs in vadose zone soils, thereby minimizing potential exposure to on-site workers.

The selected remedy affords overall effectiveness when measured against CERCLA Section 121 criteria and the NCP's nine evaluation criteria, and costs are proportionate to the protection that will be achieved.

D. THE SELECTED REMEDY UTILIZES PERMANENT SOLUTIONS AND ALTERNATIVE TREATMENT OR RESOURCE RECOVERY TECHNOLOGIES TO THE MAXIMUM EXTENT PRACTICABLE

The selected remedy represents the maximum extent to which permanent solutions and treatment technologies can be used in a cost-effective manner at the Bendix Site. The remedy permanently removes the contaminants from the natural environment in the following manner:

VOCs are extracted from vadose soils (at the source of the Eastern Plume) by a SVE system with photo-oxidation destruction of the off-gassed vapors.

U.S.EPA Kerr Laboratory has determined that through the natural attenuation (microbial anaerobic and aerobic dechlorination) process approximately 600 lbs. of TCE are destroyed annually in the Western Plume.

Natural attenuation is also occurring along the Eastern Plume, destroying TCE.

The selection remedy is protective of human health and the environment, complies with federal and state requirements that are legally applicable or relevant and appropriate, and is cost effective.

Natural Attenuation of the Eastern and Western Plumes combined with Eastern Plume source control SVE to control/reduce VOCs in vadose zone soils; maintenance of the existing vadose zone soil

cover system; environmental monitoring; and restrictions to prohibit access to vadose zone soils and ground water through institutional controls will provide the most permanent solution practicable, proportionate to cost.

E. THE SELECTED REMEDY SATISFIES THE PREFERENCE FOR TREATMENT THAT PERMANENTLY AND SIGNIFICANTLY REDUCES THE TOXICITY, MOBILITY, OR VOLUME OF THE HAZARDOUS SUBSTANCES AS A PRINCIPAL ELEMENT

The principal element of the selected remedy is treatment of the contaminated ground water by natural attenuation of contaminants in the Western and Eastern Plumes. This remedy permanently reduces the toxicity, mobility, and volume of contaminants in ground water by the microbial degradation of TCE. Vadose soils that continue to be a source of contaminants to ground water will be removed by an SVE system, off-gases will be destroyed by a photo-oxidation vapor treatment. This remedy addresses the potential threat to human health and the environment by the restoration of the ground water resource by the permanent destruction of hazardous substances. This will significantly reduce the toxicity, mobility, and volume of the hazardous substances.

XII. DOCUMENTATION OF SIGNIFICANT CHANGES

There are no significant changes from the recommended alternative described in the proposed plan.