IN THE SUPERIOR COURT OF THE STATE OF WASHINGTON
FOR KING COUNTY

STATE OF WASHINGTON DEPARTMENT OF ECOLOGY,

Plaintiff,

v.

PACCAR, Inc.,

Defendant.

No 91 2 25053 7

CONSENT DECREE

TABLE OF CONTENTS

		Page
	INTRODUCTION	2
I.	JURISDICTION AND VENUE	3
II.	PARTIES BOUND	4
III.	DEFINITIONS	5
IV.	STATEMENT OF FACTS	5
V.	WORK TO BE PERFORMED	5
VI.	DESIGNATED PROJECT COORDINATORS	7
VII.	PERFORMANCE	7
VIII.	ACCESS	8
IX.	SAMPLING, DATA REPORTING AND AVAILABILITY	9
X.	PROGRESS REPORTS	10
XI.	RETENTION OF RECORDS	11
XII.	TRANSFER OF INTEREST IN PROPERTY	11
XIII.	RESOLUTION OF DISPUTES	12
XIV.	AMENDMENT OF CONSENT DECREE	13
XV.	ENDANGERMENT	14
XVI.	OTHER ACTIONS	16
XVII.	INDEMNIFICATION	17
XVIII.	COMPLIANCE WITH APPLICABLE LAWS	17
XIX.	COST REIMBURSEMENT	18
XX.	FIVE YEAR REVIEW	19
XXI.	PUBLIC PARTICIPATION	19
XXII.	COVENANT NOT TO SUE	20
XXIII.	LAND USE RESTRICTION	22
XXIV.	CLAIMS AGAINST THE STATE	23
XXV.	RESERVATION OF RIGHTS	23
XXVI.	DURATION OF DECREE	24
XXVII.	EFFECTIVE DATE	24
XXVIII.	PUBLIC NOTICE AND WITHDRAWAL OF CONSENT	24
	Exhibit A: Legal Description	
	Exhibit B: Cleanup Action Plan	
	Exhibit C: Declaration of Restrictive Covenants	

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INTRODUCTION

A. In entering into this Consent Decree (Decree), the mutual objective of the Washington State Department of Ecology (Ecology) and PACCAR (Defendant) is to provide for remedial action relating to releases of hazardous substances at property owned and operated by PACCAR in Renton, Washington, the legal description of which is attached hereto as Exhibit A (the Site), and to protect the public health, welfare and environment. To accomplish these objectives and to resolve the matter constructively and without litigation, PACCAR consents to the actions required by this Decree.

B. The Complaint in this action is being filed simultaneously with this Decree. An answer has not been filed, and there has not been a trial on any issue of fact or law in this case. However, the parties wish to resolve the issues raised by Ecology's complaint. In addition, the parties agree that settlement of these matters without litigation is reasonable and in the public interest and that entry of this Decree is the most appropriate means of resolving these matters.

C. In signing this Decree, Defendant agrees to its entry and agrees to be bound by its terms.

D. By entering into this Decree, the parties do not intend to discharge nonsettling parties from any liability they may have with respect to matters alleged in the complaint. PACCAR and Ecology retain the right to seek reimbursement in

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whole or in part from any responsible entities for sums expended pursuant to this Decree.

E. The Court is fully advised of the reasons for entry of this Decree, and good cause having been shown: IT IS HEREBY ORDERED, ADJUDGED, AND DECREED AS FOLLOWS:

I.

JURISDICTION AND VENUE

A. This Court has jurisdiction over the subject matter and over the parties pursuant to the Model Toxics Control Act (MTCA), which was passed by initiative (Initiative 97) and which took effect on March 1, 1989. The MTCA has been codified as ch. 70.105D RCW. Venue is properly laid in King County, the location of the property at issue.

B. Authority is conferred upon the Washington State Attorney General by RCW 70.105D.040(4)(a) to agree to a settlement with any potentially liable person if, after public notice and hearing, Ecology finds the proposed settlement would lead to a more expeditious cleanup of hazardous substances in compliance with cleanup standards under RCW 70.105D.030(2)(d). RCW 70.105D.040(4)(b) requires that such a settlement be entered as a consent decree issued by a court of competent jurisdiction.

C. Ecology has given notice to PACCAR, as provided in RCW 70.105D.020(8), of Ecology's determination that PACCAR is a potentially liable person for the Site and that there has been a release of hazardous substances at the Site.

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D. Ecology has determined that past activities at the Site have given rise to a release of hazardous substances, which requires remedial action pursuant to ch. 70.105D RCW.

E. The actions to be taken pursuant to this Decree are necessary to protect the public health, welfare and the environment.

F. By entering into this Decree, PACCAR agrees not to challenge the jurisdiction of Ecology in any proceeding to enforce this Decree. PACCAR has agreed to voluntarily undertake the actions specified in this Decree and consents to the issuance of this Decree, pursuant to ch. 70.105D RCW.

II.

PARTIES BOUND

This Decree shall apply to and be binding upon the signatories to this Decree (parties), their successors and assigns. The undersigned representative of each party hereby certifies that he or she is fully authorized to enter into this Decree and to execute and legally bind such party to comply with the Decree. Defendant agrees to undertake all actions required by the terms and conditions of this Decree and not to contest state jurisdiction regarding this Decree. No change in Defendant's ownership or corporate status shall alter the responsibility of the Defendant under this Decree. Defendant shall make a copy of this Decree available to each of its agents, including all contractors and subcontractors retained to perform work contem-

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plated by this Decree, and shall condition any contract for such work on compliance with this Decree.

III.

DEFINITIONS

Unless otherwise specified, the definitions set forth in the Model Toxics Control Act, ch. 70.105D RCW, shall control the meaning of the terms used in this Consent Decree.

IV.

STATEMENT OF FACTS

The Cleanup Action Plan (CAP) attached to this Consent Decree as Exhibit B contains a detailed statement of facts regarding the history, description, and condition of the Site. Based on the facts outlined in the CAP, Ecology has determined that the release or potential release of hazardous substances at the Renton Site requires remedial actions pursuant to ch. 70.105D RCW. This Decree sets forth measures necessary to insure the protection of public health, welfare and the environment. Ecology has determined that PACCAR is a potentially liable person for purposes of implementing the remedial actions described below.

V.

WORK TO BE PERFORMED

This Consent Decree contains a program designed to protect the public health and welfare and the environment from the known release, or threatened releases, of hazardous substances and

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pollutants at, on, or from the Site. The work to be performed by the Defendant and the schedule for performance are described in the Cleanup Action Plan set forth at Exhibit B. Exhibits B and C (Declaration of Restrictive Covenants) are made integral and enforceable parts of this Consent Decree. The term "Consent Decree" shall include Exhibits B and C whenever used in this document. Except where performance by another party is expressly provided for, the Defendant commits to implement the requirements of Exhibits B and C.

Any changes to the work to be performed will be documented. PACCAR or its representative will contact Ecology to propose any such changes. Initial contact and approval may be accomplished either verbally or in writing. Proposals for changes to the work to be performed must include justification for the changes proposed. If initial contact is verbal, both PACCAR's request and Ecology's approval or disapproval must be documented in writing. Any disagreement shall be addressed through the dispute resolution procedures described in Section XIII of this Decree.

If remedial action significantly different from that set forth in the Cleanup Action Plan, Exhibit B, is agreed to or required at the Site, the amended Cleanup Action Plan shall be the subject of public notice and comment.

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VI.

DESIGNATED PROJECT COORDINATORS

On or before the entry of this Decree, Ecology and Defendant shall each designate a project coordinator. Each project coordinator shall be responsible for overseeing the implementation of this Decree. The Ecology project coordinator will be Ecology's designated representative at the Site. To the maximum extent possible, communications between Ecology and the Defendant and all documents, including reports, approvals, and other correspondence concerning the activities performed pursuant to the terms and conditions of this Decree, shall be directed through the project coordinators. The project coordinators may designate working level staff contacts for all or portions of the implementation of the remedial work required by this Decree.

Any party may change its respective project coordinator. To the extent possible, written notification shall be given to the other party, in writing, at least ten (10) calendar days prior to the change.

The project coordinator for Ecology is David L. South. The project coordinator for PACCAR is Robert K. Butler.

VII.

PERFORMANCE

All work performed pursuant to this Decree shall be under the direction and supervision, as necessary, of a professional

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engineer, qualified hydrogeologist, or equivalent, with experience and expertise in hazardous waste site investigation and cleanup. For all purposes of this Decree, Robert K. Butler, P.E., and Defendant's consultant, Hart Crowser, are approved as having these qualifications.

VIII.

ACCESS

Ecology or any Ecology authorized representative shall have the authority to enter and freely move about all property at the Site at all reasonable times for the purposes of, inter alia: inspecting and copying all records, operation logs, plans, specifications, engineering designs, files, photographs, documents, and other writings, including all sampling and monitoring data, related to the work being performed pursuant to this Decree; reviewing the progress in carrying out the terms of this Decree; conducting such tests or collecting samples as Ecology or the project coordinator may deem necessary; using a camera, sound recording, or other documentary type equipment to record work done pursuant to this Decree; and verifying the data submitted to Ecology by the Defendant. In the event that neither Defendant's project coordinator nor an employee of Defendant's consultants is present on the Site, or in the event Ecology wishes to conduct sampling, Ecology will, except in emergency situations, provide Defendant's project coordinator with five (5) days' notice prior to entering the Site. Upon

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QA-44

request, Ecology shall split any samples taken during an inspection unless the Defendant fails to make available a representative for the purpose of splitting samples. All parties with access to the Site pursuant to this paragraph shall comply with reasonable health and safety requirements.

The foregoing paragraph notwithstanding, the parties agree that Ecology shall not have access to privileged material and that, to the extent permitted by law, Ecology will maintain the confidentiality of proprietary information which shall be subject to Ecology access.

IX.

SAMPLING, DATA REPORTING AND AVAILABILITY

The Defendant shall make the results of all sampling, laboratory reports, and/or test results generated by them, or on their behalf, with respect to the implementation of this Decree available to Ecology and shall submit these results in interim or final reports submitted in accordance with the provisions of the Cleanup Action Plan.

At the request of Ecology, the Defendant shall allow split or duplicate samples to be taken by Ecology and/or its authorized representatives of any samples collected by the Defendant pursuant to the implementation of this Decree. Except in the event of an emergency, the Defendant shall notify Ecology five (5) working days in advance of any sample collection activity. Ecology shall allow split or duplicate samples to be taken by

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the Defendant, or its authorized representatives, of any samples collected by Ecology pursuant to the implementation of this Decree. Except in the event of an emergency, Ecology shall notify the Defendant five (5) working days prior to conducting any sample collection activity.

X.

PROGRESS REPORTS

Defendant shall submit to Ecology written quarterly progress reports which describe the actions it has taken during the previous quarter to implement the requirements of this Decree. Progress reports shall also describe the activities scheduled to be taken during the next quarter. All progress reports shall be submitted by the tenth (10th) day of the month in which they are due, commencing after the effective date of this Decree. The progress reports shall include a detailed statement of the manner and extent to which the requirements and time schedules set out in the Decree are being met. Unless otherwise specified, progress reports and any other documents submitted pursuant to this Decree shall be sent by certified mail, return-receipt requested, to Ecology's project coordinator at the following:

David South
Northwest Regional Office
Department of Ecology
3190 - 160th Avenue S.E.
Bellevue, Washington 98008-5452

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QA-44

XI.

RETENTION OF RECORDS

Defendant shall preserve, during the pendency of this Decree and for ten (10) years from the date of total completion of all work described in the Cleanup Action Plan, all records, reports, documents, and underlying data in its possession relevant to the implementation of this Decree and shall insert in contracts with project contractors a similar records retention requirement. Upon request of Ecology, Defendant shall make all non-privileged, non-archived records available to Ecology and allow access for review. All non-privileged, archived records shall be made available to Ecology within a reasonable period of time. Ecology agrees, to the extent permitted by law, to maintain the confidentiality of any proprietary information requested.

XII.

TRANSFER OF INTEREST IN PROPERTY

No voluntary or involuntary conveyance or relinquishment of title, easement, leasehold, or other interest in any portion of the Site shall be consummated without provision for continued operation and maintenance of any containment system, treatment system, and monitoring system installed or implemented pursuant to this Decree.

Prior to transfer of any legal or equitable interest in all or any portion of the property, Defendant shall serve a copy of

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Olympia, WA 98504-8077

this Decree and the attached Exhibits upon any prospective purchaser, lessee, transferee, assignee, or other successor in interest of the property; and, at least thirty (30) days prior to any transfer, Defendant shall notify Ecology of said contemplated transfer.

XIII.

RESOLUTION OF DISPUTES

If Defendant objects to any Ecology disapproval, proposed modification, or decision made pursuant to this Decree, it shall notify Ecology in writing of its objections within fourteen (14) calendar days of receipt of such notice. Thereafter, the parties shall confer in an effort to resolve the dispute. If agreement cannot be reached on the dispute within fourteen (14) calendar days after receipt by Ecology of such objections, Ecology shall promptly provide a written statement of its decision to Defendant.

If Ecology's final written decision is unacceptable to Defendant, Defendant has the right to submit the dispute to the Court for resolution. The parties agree that one judge should retain jurisdiction over this case and shall, as necessary, resolve any dispute arising under this Decree. In the event Defendant presents an issue to the Court for review, the Court shall review the action or decision of Ecology on the basis of whether such action or decision was arbitrary and capricious and render a decision based on such standard of review. Ecology and

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Defendant agree to only utilize the dispute resolution process in good faith and agree to expedite, to the extent possible, the dispute resolution process whenever it is used. Where either party utilizes the dispute resolution in bad faith or for purposes of delay, the other party may seek sanctions.

Implementation of these dispute resolution procedures shall not provide a basis for delay of any activities required in this Decree, unless Ecology agrees in writing to a schedule extension or the Court so orders.

XIV.

AMENDMENT OF CONSENT DECREE

This Decree may only be amended by a written stipulation between the parties, entered by the Court, or by Court order. Such amendment shall become effective upon entry by the Court. Agreement to amend shall not be unreasonably withheld by any party to the Decree.

Defendant shall submit any request for an amendment to Ecology for approval. Ecology shall indicate its approval or disapproval within fifteen (15) working days after the request for amendment is received. Reasons for the disapproval shall be stated in writing. If Ecology does not agree to any proposed amendment, the disagreement may be addressed through the dispute resolution procedures described in Section XIII of this Decree.

No guidance, suggestions, or comments by Ecology will be construed as relieving Defendant of its obligation to obtain

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formal approval as may be required by this Decree. No verbal communication by Ecology shall relieve Defendant of the obligations specified herein.

Ecology shall notify Defendant of any Ecology requested amendment and, within fifteen (15) working days of receipt of such a request, the Defendant shall, in writing, indicate its agreement or disagreement and, if it disagrees, the rationale. If Defendant does not agree with any Ecology proposed amendment, the disagreement may be addressed through the dispute resolution procedures described in Section XIII of this Decree.

XV.

ENDANGERMENT

In the event Ecology determines or concurs in a determination by another local, state, or federal agency that activities implementing or in noncompliance with this Decree, or any other circumstances or activities, are creating or have the potential to create a danger to the health or welfare of the people on the Site or in the surrounding area or to the environment, Ecology may order Defendant to stop further implementation of this Decree for such period of time as needed to abate the danger or may petition the Court for an order, as appropriate. During any stoppage of work under this section, the obligations of Defendant with respect to the work ordered to be stopped shall be suspended and the time periods for performance of that work

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QA-44
Olympia, WA 98504-8077

, as well as the time period for any other work dependent upon the work which is stopped, shall be extended, pursuant to Section XIV of this Decree, for such period of time as Ecology determines is reasonable under the circumstances.

In the event Defendant determines that activities undertaken in furtherance of this Decree or any other circumstances or activities are creating a danger to the health and welfare of people on the Site or in the surrounding area or to the environment, Defendant may stop implementation of this Decree for such periods of time necessary for Ecology to evaluate the situation and determine whether Defendant should proceed with implementation of the Decree or whether the work stoppage should be continued until the danger is abated. Defendant shall notify either Ecology field personnel on-site or the project coordinator as soon as is possible, but no later than twenty-four (24) hours after such stoppage of work, and provide Ecology with documentation of its analysis in reaching this determination. If Ecology disagrees with Defendant's determination, it may order Defendant to resume implementation of this Decree. If Ecology concurs in the work stoppage, Defendant's obligations shall be suspended and the time period for performance of that work, as well as the time period for any other work dependent upon the work which was stopped, shall be extended, pursuant to Section XIV of this Decree, for such period of time as Ecology determines is reasonable under the circumstances. Any disagree-

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QA-44
Olympia, WA 98504-8077

ments pursuant to this clause shall be resolved through the dispute resolution procedures in Section XIII.

XVI.

OTHER ACTIONS

Ecology reserves its rights to institute remedial action(s) at the Site, and subsequently pursue cost recovery, and to issue orders and/or penalties pursuant to available statutory authority, under the following circumstances:

1. Where Defendant fails to adhere to any requirement of this Decree;

2. In the event or upon the discovery of a release or threatened release not addressed by this Decree, which Defendant, after notice, fails to address;

3. Upon Ecology's determination that action beyond the terms of this Decree is necessary to abate an emergency situation which threatens the public health or welfare or the environment and which Defendant, after notice, fails to address; or

4. Upon the occurrence or discovery of facts or conditions beyond the scope of this Decree as to which Ecology would be empowered to perform any remedial action or to issue an order and/or penalty, or to take any other enforcement action under applicable laws other than the Model Toxics Control Act, and which Defendant, after notice, fails to address.

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QA-44
Olympia, WA 98504-8577

XVII.

INDEMNIFICATION

Defendant agrees to indemnify and save and hold the State of Washington, its employees, and agents harmless from any and all claims or causes of action for death or injuries to persons or for loss or damage to property arising from or on account of acts or omissions of Defendant, its officers, employees, agents, or contractors in entering into and implementing this Decree. However, the Defendant shall not indemnify the State of Washington nor save nor hold its employees and agents harmless from any claims or causes of action arising out of the acts or omissions of the State of Washington, or the employees or agents of the State, in implementing activities pursuant to this Decree.

XVIII.

COMPLIANCE WITH APPLICABLE LAWS

All actions carried out by Defendant pursuant to this Decree shall be conducted in accordance with all applicable laws and requirements, including requirements, if any, to obtain necessary permits.

All facilities used by Defendant for the off-site treatment, storage, or disposal of hazardous wastes removed from the Site must be in compliance with the applicable requirements of the Resource Conservation and Recovery Act, as amended in November 1984, 42 U.S.C. 6901, et. seq.; and ch. 70.105 RCW.

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QA-44
Olympia, WA 98504-8077

Defendant must designate in a report to Ecology any facilities that Defendant proposes to use for such off-site storage, treatment, or disposal, and Ecology must give prior approval for the use of such facilities.

XIX.

COST REIMBURSEMENT

Defendant agrees to reimburse the State of Washington for Ecology's actual reasonable and appropriate investigative, remedial action, and oversight costs, relating to Ecology activities associated with the Site, which are incurred in connection with the implementation of this Decree. Ecology will submit to Defendant a quarterly summary statement of Ecology's expenses relating to the Site. Within ninety (90) days of receipt of the statement, Defendant shall pay into the State Toxics Control Account of the State of Washington the required sum. Any dispute regarding cost reimbursement shall be addressed through the dispute resolution process described in Section XIII of this Decree.

Defendant further agrees to reimburse the appropriate account of the Treasury of the State of Washington, within ninety (90) days of receipt of a summary expense statement, for any Ecology costs relating to the Site which were incurred prior to the entry of this Decree, and which remain unpaid on the effective date of this Decree.

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XX.

FIVE YEAR REVIEW

As remedial action, including groundwater monitoring, continues at the Site, the parties agree to review the progress of remedial action at the Site, and to review the data accumulated as a result of site monitoring as often as is necessary and appropriate under the circumstances. At least every five years during the term of this Decree, the parties shall meet to discuss the status of the Site and the need, if any, of further remedial action at the Site. Ecology reserves the right to require further remedial action at the Site pursuant to Section XVI of this Decree.

XXI.

PUBLIC PARTICIPATION

Ecology shall maintain the responsibility for public participation at the Site. However, Defendant shall cooperate with Ecology and shall:

A. Prepare drafts of public notices and fact sheets at important stages of the remedial action, such as the completion of engineering design. Ecology will finalize (including editing if necessary) and distribute such fact sheets and prepare and distribute public notices of Ecology's presentations and meetings;

B. Notify Ecology's project coordinator prior to the issuance of all press releases and fact sheets, and before major

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QA-44
Olympia, WA 98504-8077

meetings with the interested public and local governments. Likewise, Ecology shall notify Defendant prior to the issuance of all press releases and fact sheets, and before major meetings with the interested public and local governments;

C. Participate in public presentations on the progress of Remedial Action at the Site. Participation may be through attendance at public meetings to assist in answering questions or as a presenter;

D. In cooperation with Ecology, arrange and/or continue information repositories to be located at the City of Renton Public Library and at Ecology's Northwest Regional Office in Bellevue. At a minimum, copies of all public notices, fact sheets, and press releases, all quality assured groundwater, surface water, soil sediment, and air monitoring data, remedial action plans, supplemental remedial planning documents, and all other similar documents relating to performance of the remedial action required by this Decree shall be promptly placed in these repositories.

XXII.

COVENANT NOT TO SUE

In consideration of Defendant's compliance with the terms and conditions of this Decree, the state agrees that compliance with this Decree shall stand in lieu of any and all administrative, legal, and equitable remedies and enforcement actions available to the state against Defendant for the release or

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Olympia, WA 98504-8077

threatened release of hazardous substances covered by the terms of this Decree.

This covenant is strictly limited in its application to the Site specifically defined in Exhibit A and to those hazardous substances which Ecology knows to be located at the Site as of the entry of this Decree. This Covenant is not applicable to any other hazardous substance or area and the state retains all of its authority relative to such substances and areas.

A. Reopeners: In the following circumstances the State of Washington may exercise its full legal authority to address releases of hazardous substances at the Site notwithstanding the Covenant Not to Sue set forth above:

1. In the event Defendant fails to comply with the terms and conditions of this Consent Decree, including all exhibits, and, after written notice of noncompliance, fails to come into compliance;

2. In the event new information becomes available regarding factors previously unknown to Ecology, including the nature or quantity of hazardous substances at the Site, and Ecology determines, in light of this information, that further remedial action is necessary at the Site to protect human health or the environment, and Defendant, after notice, fails to take the necessary action within a reasonable time;

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3. In the event conditions at the Site cause an endangerment to human health or the environment under Section XVII of this Consent Decree, and Defendant, after notice, fails to eliminate the endangerment within a reasonable time;

4. In the event the remedial action conducted at the Site fails to meet the requirements set forth in Exhibit B to this Consent Decree.

B. Applicability: The Covenant Not to Sue set forth above shall have no applicability whatsoever to:

1. Criminal liability;

2. Liability for damages to natural resources;

3. Any Ecology action against potentially liable parties not a party to this Decree.

XXIII.

LAND USE RESTRICTION

Upon entry of this Decree, Defendant agrees that the restrictive covenant, attached hereto as Exhibit "C," shall be recorded with the Office of the King County Auditor and shall restrict future uses of the Site. With Ecology's prior written approval, and after completion of the remedial action required by this Decree, Defendant, or its successor(s), may record an instrument which provides that the restrictive covenant provided at Exhibit "C" shall no longer limit uses of the Site or be of any further force or effect.

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XXIV.

CLAIMS AGAINST THE STATE

Defendant hereby agrees that it will not seek to recover any costs accrued in implementing this Decree from the State of Washington or any of its agencies and, further, that the Defendant will make no claim against the state toxics control account or any local toxics control account for any costs incurred in implementing this Decree.

XXV.

RESERVATION OF RIGHTS

By agreeing to the entry of this Decree, the Defendant and Ecology agree to abide by its terms. While the parties believe that the recitals contained in this Decree are accurate, the execution and performance of the Decree is not, however, an admission by the Defendant of any fact or liability for any purpose other than as a foundation for the entry of this Decree. Defendant's performance under the Decree is undertaken without waiver of or prejudice to any claims or defenses whatsoever that may be asserted in the event of further administrative proceedings or litigation not associated with, or related to, this Decree. Nor is the execution or the performance of the Decree an agreement by Defendant to take any action at the Site other than that described in this document.

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XXVI.

DURATION OF DECREE

This Decree shall remain in effect and the work described in the Decree shall be maintained and continued until the work called for by this Decree has been satisfactorily completed or until Ecology and the Defendant agree in writing that the Decree should be terminated and/or a Court directs that the Decree be terminated.

XXVII.

EFFECTIVE DATE

This Decree is effective upon the date it is entered by the Court.

XXVIII.

PUBLIC NOTICE AND WITHDRAWAL OF CONSENT

This Decree has been the subject of public notice and comment under RCW 70.105D.040(4)(a). As a result of this process, Ecology has found that this Decree will lead to a more expeditious cleanup of hazardous substances at the Site, in compliance with applicable cleanup standards.

If the Court withholds or withdraws its consent, this Decree shall be null and void at the option of any party and the accompanying Complaint shall be dismissed without costs and without prejudice. In such an event, no party shall be bound by the requirements of this Decree.

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SIGNED BY THE PARTIES on the dates indicated below. Further notice of presentment to the Court for entry is waived.

PACCAR Inc

By _____
R. PAUL BEVERIDGE
Heller, Ehrman, White & McAuliffe
Attorneys for PACCAR Inc.

Date 10/3/91

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

By _____
CAROL FLESKES
Program Manager
Toxics Cleanup Program
Department of Ecology

Date 10/17/91

STATE OF WASHINGTON
OFFICE OF ATTORNEY GENERAL

_____
JERRY A. ACKERMAN
Assistant Attorney General
Attorneys for State of Washington

Date 10/17/91

This DECREE is approved and IT IS SO ORDERED this _____ day of _____, 19__.

RECEIVED
NOV 8 1991
STEPHEN M. GADDIS
COURT COMMISSIONER

Presented by:

_____
SUPERIOR COURT JUDGE
King County Superior Court

133/paccar.csd

EXHIBIT A

DODDS ENGINEERS, INC.
BELLEVUE, WA 98007

PACCAR
DEI Project No. 85123
May 8, 1986
Revised November 30, 1987
Revised June 13, 1991

PARCEL A

All those portions of the south half of Section 8, Township 23 North, Range 5 East, W.M., in the City of Renton, King County, Washington, and of Renton Farm Acreage, as recorded in Volume 12 of Plats, page 37, records of said county, including vacated streets and avenues as would attach by operation of law, and of Car Works Addition to the City of Renton, as recorded in Volume 15 of Plats, page 47, records of said county, including vacated streets, avenues, and alleys as would attach by operation of law, described as follows:

Commencing at the east quarter corner of said Section 8, from which point the northeast corner of said section bears N01°02'09"E; thence N89°27'25"W, along the north line of said south half, 2647.56 feet to an existing center of section monument; thence S01°02'40"W, along the north-south center of section line of said Section 8, a distance of 60.00 feet to the southerly margin of North 8th Street, said point being on the south line of the north 30.00 feet of Block 1 of said Renton Farm Acreage, and the TRUE POINT OF BEGINNING; thence N89°27'25"W, along the south line of the north 30.00 feet of said Block 1 and its westerly prolongation, 986.13 feet to a point on the west line of Block 2 of said plat; thence S01°05'34"W, along said west line and its southerly prolongation, 1235.01 feet to the southwest corner of Block 5 of said plat, said point being on the easterly margin of Garden Avenue North; thence S01°05'34"W, along said easterly margin, 1099.75 feet to the northwest corner of Lot 1, Block 4, of aforesaid Car Works Addition to the City of Renton; thence S89°23'14"E, along the north line of said Lot 1 and its easterly prolongation 119.00 feet to the northwest corner of Lot 10 of said Block 4; thence S01°05'51"W, along the west line of Lots 6, 7, 8, 9, and 10 of said Block 4, a distance of 226.95 feet to the southerly line of said Block 4; thence S89°23'14"E, along the southerly line of said Block 4 and its easterly prolongation, 869.30 feet to a point on the north-south center of section line of said Section 8; thence S89°23'14"E, along the south line of Block 13 and its easterly prolongation (if any) of said plat, 248.21 feet to the westerly margin of vacated Houser Way North (a.k.a. Railroad Avenue); thence N23°50'20"E, along the westerly margin of said vacated Houser Way North, 414.23 feet to a point of tangency with a 789.02 foot radius circular curve to the left; thence northerly along said curve and said westerly margin through a central angle of 22°50'00" an arc distance of 314.44 feet to a point of tangency;

DODDS ENGINEERS, INC.
BELLEVUE, WA 98007

PACCAR
DEI Project No. 85123
May 8, 1986
Revised November 30, 1987
Revised June 13, 1991

thence N01°00'20"E, along said westerly margin 1621.58 feet to a point of tangency with a 543.69 foot radius circular curve to the left; thence northerly, along said curve and said westerly margin, through a central angle of 00°07'54", an arc distance of 1.25 feet to a point on the southwesterly margin of the Burlington Northern Railroad right-of-way, said point being on a 691.78 foot radius circular curve to the left, from which point the center bears S39°27'38"W; thence northwesterly, along said curve and said margin, through a central angle of 08°27'46", an arc distance of 102.18 feet; thence continuing along said margin N59°00'08"W 151.23 feet to a point of tangency with a 757.01 foot radius circular curve to the right; thence northwesterly, along said curve and said margin, through a central angle of 14°46'33", an arc distance of 195.22 feet to the south line of the north 60.00 feet of the south half of said Section 8; thence N89°27'25"W, along said south line, 98.96 feet to the TRUE POINT OF BEGINNING.

Containing approximately 3,596,945 square feet or 82.5745 acres, more or less.

6/17/91

EXHIBIT A

DODDS ENGINEERS, INC.
BELLEVUE, WA 98007

PACCAR
DEI Project No. 85123
May 8, 1986

PARCEL A-1

All that portion of the south half of Section 8, Township 23 North, Range 5 East, W.M., in the City of Renton, King County, Washington, described as follows:

Commencing at the east quarter corner of said Section 8, from which the northeast corner of said section bears N01°02'09"E; thence N89°27'25"W, along the north line of said south half, 2647.56 feet to an existing center of section monument; thence S01°02'40"W, along the north-south center of section line of said Section 8, a distance of 60.00 feet to the southerly margin of North 8th Street, said point being on the south line of the north 60.00 feet of said south half; thence S89°27'25"E, along said south line, 187.07 feet to a point on the northeasterly margin of the Burlington Northern Railroad right-of-way and the TRUE POINT OF BEGINNING; thence continuing S89°27'25"E, along said south line, 225.49 feet to a point on the westerly margin of Houser Way North (aka Railroad Avenue); thence S18°00'40"E, along said westerly margin, 82.32 feet to a point of tangency with a 543.68 foot radius curcular curve to the right; thence southerly, along said curve and said westerly margin, through a central angle of 09°49'26", an arc distance of 93.22 feet to a point on the northeasterly margin of said railroad right-of-way; thence N57°49'50"W, along said northeasterly margin, 321.37 feet to the TRUE POINT OF BEGINNING.

Containing approximately 19,452 square feet or 0.4465 acres more or less.

EXHIBIT B

FINAL CLEANUP ACTION PLAN

PACCAR Defense Systems Site
Renton, Washington

by
Washington Department of Ecology

September 6,1991

Table of Contents

List of Tables v

List of Figures vi

List of Acronyms and Abbreviations vii

PREFACE viii

DECLARATIVE STATEMENT ix

EXECUTIVE SUMMARY x

1. INTRODUCTION 1
 1.1 PURPOSE 1
 1.2 SCOPE 1
 1.3 APPLICABILITY 2
 1.4 THE FCAP AND THE CLEANUP PROCESS 2
 1.5 ADMINISTRATIVE RECORD 4

2. SITE DESCRIPTION AND HISTORY 5
 2.1 SITE LOCATION 5
 2.2 SITE HISTORY 5
 2.3 CURRENT STATUS 5
 2.4 PAST ACTIVITIES OF ENVIRONMENTAL CONCERN . . 6
 2.5 INTERIM ACTIONS 7
 2.6 FUTURE USE 8

3. SUMMARY OF ENVIRONMENTAL ISSUES 9
 3.1 METHODS OF INVESTIGATION 9
 3.2 SITE GEOLOGY AND HYDROLOGY 9
 3.3 CHEMICALS OF CONCERN 11
 3.4 RISKS TO HUMAN HEALTH AND THE ENVIRONMENT . . 14
  3.4.1 Media of Concern 14
   3.4.1.1 Soil 14
   3.4.1.2 Ground Water 15
   3.4.1.3 Surface Water 17
   3.4.1.4 Sediment 17
  3.4.2 Baseline Risk Assessment 18
   3.4.2.1 Toxicology of Chemicals of Concern 18
   3.4.2.2 Exposure Pathways 19
   3.4.2.3 Overall Assessment 19
 3.5 REMEDIAL ACTION OBJECTIVES 22
 3.6 MEDIA CLEANUP LEVELS 24

3.6.1 Selection of Method for Establishing Cleanup Levels 24
3.6.2 Ground-Water Cleanup Levels 26
3.6.3 Surface Water Cleanup Levels 30
3.6.4 Soil Cleanup Levels 31
3.6.5 Sediment Cleanup Standards 36
3.6.6 Multiple Pathways of Exposure 36

4. SUMMARY OF ALTERNATIVE CLEANUP ACTIONS 37
4.1 INTRODUCTORY REMARKS 37
4.2 GENERAL RESPONSE ACTIONS 37
4.3 REMEDIAL ALTERNATIVES 38
4.4 DETAILED DEVELOPMENT OF SELECTED ALTERNATIVES 39
4.4.1 EPA Comparison Criteria 39
4.4.2 Comparative Analysis 40

5. SELECTION OF CLEANUP ACTION 43
5.1 SELECTION OF CLEANUP ACTIONS 43
5.2 OVERVIEW OF THE SELECTED CLEANUP ACTION . . . 44
5.3 SOIL CLEANUP 46
5.3.1 General Description 46
5.3.2 Excavation and Treatment of Arsenic Lead, CPAH, and TPH Contaminated Soils . 47
5.3.2.1 Setting of Hot-Spot Action Levels 48
5.3.2.2 Treatment Methods 50
5.3.3 Excavation and Disposal of PCB Contaminated Soil 53
5.3.4 Structural Fill Cover 54
5.3.5 Stormwater System Improvements 55
5.3.6 Quality Assurance/Quality Control . . 55
5.3.7 Monitoring 55
5.3.8 Air Monitoring During Remedial Activities 56
5.3.9 Maintenance and Health and Safety Considerations 56
5.4 GROUND-WATER CLEANUP 56
5.5 SURFACE WATER CLEANUP 58
5.6 SEDIMENT CLEANUP 59
5.7 INSTITUTIONAL CONTROLS 59
5.8 EVALUATION OF THE CLEANUP ACTION WITH RESPECT TO FEDERAL AND STATE REQUIREMENTS 60
5.9 CHANGED CONDITIONS 62
5.10 SEPA 63
5.11 PERMITTING 63
5.12 ERRORS 63

5.13 PUBLIC COMMENT 63

6. COMPLIANCE MONITORING 65

7. SCHEDULE FOR IMPLEMENTATION 67

8. REFERENCES 68
8.1 REFERENCES CITED IN TEXT 68
8.2 ADDITIONAL REFERENCES 69

APPENDIX A - APPLICABLE OR RELEVANT AND APPROPRIATE REGULATIONS (ARAR's) 122

APPENDIX B - SEPA DOCUMENTS 125

APPENDIX C - RESPONSIVENESS SUMMARY 126

List of Tables

Table Number	Title	
3.1	Summary of Chemicals for Which Analyses Were Performed at the PACCAR Defense Systems Site	71
3.2	Summary of Chemicals of Concern	75
3.3	Summary of Metals Ground-Water Data	76
3.4	Remedial Action Objectives at PACCAR's Renton Site	77
3.5	Concentration Levels Required to Meet RAO's for Chemicals of Concern in Soil at PACCAR's Renton Site	78
3.6	Ground-Water Cleanup Levels WAC 173-340-720, Method B	80
3.7	Surface-Water Cleanup Levels WAC 173-340-730, Method B	81
3.8	Soil Cleanup Levels WAC 173-340-740, Method B	82
4.1	Preliminary Remedial Alternatives	85
4.2	Alternatives Retained for Detailed Analysis	87
4.3	Expectations for Superfund Remedial Actions	88
4.4	The EPA's Nine Remedial Evaluation Criteria	89
4.5	Comparative Analysis of Soil Alternatives	92
4.6	Comparative Analysis of Ground-Water Remediation Alternatives	94
4.7	Comparative Analysis of Sediment Alternatives	95
5.1	Estimated Soil and Sediment Volumes	96
A-1	Chemical Specific ARAR's	123
A-2	Action Specific ARAR's	124

List of Figures

Figure Number	Title	
1.1	Documents Required Under the Model Toxics Control Act Regulation (WAC 173-349) Cleanup Process	97
2.1	Site Location	98
2.2	Plant Layout	99
2.3	Site Drainage	100
3.1	Geologic Sections	101
3.2	Location of Geologic Sections	102
3.3	Position of Ground-Water Divide	103
3.4	Aquifer Protection Area (APA) Map	104
3.5	Distribution of Lead in Ground Water from Shallow Wells	105
3.6	Distribution of Lead in Ground Water from Deep Wells	106
3.7	Distribution of Arsenic in Ground Water from Shallow Wells	107
3.8	Distribution of Arsenic in Ground Water from Deep Wells	108
3.9	Distribution of Volatile Chemicals in Ground Water from Shallow Wells	109
3.10	Distribution of Volatile Chemicals in Ground Water from Deep Wells	110
3.11	Vinyl Chloride Concentrations versus Time in Ground Water from Wells LW-6D and LW-9D	111
3.12	Approximate Extent of Soil Contamination Above MTCA Cleanup Levels	112
5.1	Approximate Extent of Contaminated Soil to be Excavated Under Soil Alternatives 8 and 9/10 and Sediment Alternative 5	113
5.2	Extent of Cover System	114
5.3	Arsenic Concentration vs. Soil Volume	115
5.4	Chromium Concentration vs. Soil Volume	116
5.5	Lead Concentration vs. Soil Volume	117
5.6	CPAH Concentration vs. Soil Volume	118
5.7	TPH Concentration vs. Soil Volume	119
5.8	PCB Concentration vs. Soil Volume	120
5.9	Location of Proposed Stormwater System	121

List of Acronyms and Abbreviations

CERCLA	Comprehensive Environmental Response, Liability, Compensation, and Liability Act
CFR	Code of Federal Regulations
CPAH	Carcinogenic Polycyclic Aromatic Hydrocarbon
EPA	Environmental Protection Agency
DCAP	Draft Cleanup Action Plan
FCAP	Final Cleanup Action Plan
HPAH	High molecular weight Polycyclic Aromatic Hydrocarbon
HSAL	Hot-Spot Action Level
LPAH	Low molecular weight Polycyclic Aromatic Hydrocarbon
mg/kg	milligrams per kilogram (same as ppm)
mg/L	milligrams per liter (same as ppm)
MCL	Maximum Concentration Limit
MCLG	Maximum Concentration Limit Goal
MTCA	Model Toxics Control Act
NCP	National Contingency Plan
NPDES	National Pollutant Discharge Elimination System
PCB	Polychlorinated biphenyl
PLP	Potentially Liable Party
ppb	Parts per billion (same as ug/L or ug/kg)
ppm	Parts per million (same as mg/L or mg/kg)
RAO	Remedial Action Objective
RCW	Revised Code of Washington
RI/FS	Remedial Investigation/Feasibility Study
SDWA	Safe Drinking Water Act
SEPA	State Environmental Policy Act
TBC	To-Be-Considered
TPAH	Total Polycyclic Aromatic Hydrocarbon
TPH	Total Petroleum Hydrocarbon
ug/kg	micrograms per kilgrame (same as ppb)
ug/L	micrograms per liter (same as ppb)
UST	Underground storage tank
WAC	Washington Administrative Code

PREFACE

In preparing this document a balance had to be struck between writing for public review by citizens who may not be familiar with technical terminology used in the environmental sciences and writing in a manner which conveys technical accuracy. Wherever possible, concepts have been presented in terms which may be found in a standard dictionary. Where the use of technical terms or jargon was unavoidable to correctly express concepts, those terms have been defined. The standard dictionary consulted was Webster's II New Riverside University Dictionary.

Many of the figures in this document have been reproduced by photocopying figures in the Remedial Envestigation and Feasibility Study (RI/FS) reports (HartCrowser 1989 and HartCrowser, 1990a). This often required reduction, and readibility was reduced. More readable copies of these figures may be found in reports, which are co-located with this document in the public repositories or in Ecology's Central Files at the Northwest Regional Office. In some cases, HartCrowser has updated figures with new data which has been collected or additional calculations which have been performed since completion of the RI/FS reports.

DECLARATIVE STATEMENT

Consistent with the Chapter 70.105D RCW, "Model Toxics Control Act", as implemented by Chapter 173-340 WAC, "Model Toxics Control Act Cleanup Regulation", it is determined that the selected cleanup actions are protective of human health and the environment, attain Federal and State requirements which are applicable or relevant and appropriate, comply with cleanup standards, and provide for compliance monitoring. The cleanup actions satisfy the preference expressed in WAC 173-340-360 for the use of permanent solutions to the maximum extent practicable, provide for a reasonable restoration time frame, and consider public concerns raised during public comment on the draft Cleanup Action Plan.

David L. South — September 6, 1991
David L. South — Date
Senior Engineer, Northwest Region
Toxics Cleanup Program
Washington Department of Ecology

Michael J. Gallagher — September 6, 1991
Michael J. Gallagher — Date
Section Head, Northwest Region
Toxics Cleanup Program
Washington Department of Ecology

EXECUTIVE SUMMARY

PACCAR's facility opened in 1907 as Pacific Car and Foundry, operating a foundry and rail car manufacturing plant on the south 40 acres of the site. Over the years the facility expanded northward and eastward to cover the current 82 acres, with the last property acquisition occurring in the late 1960's. The company's name was changed to PACCAR Defense Systems in the early 1980's. At its peak, the facility employed about 2,100 workers engaged in building rail cars, Sherman tanks, and other military vehicles. It quit making rail cars in 1984. From 1984 to 1988, military vehicles, castings, forgings, and other industrial products were produced at the site. In 1988, manufacturing operations ceased and decommissioning of the plant began.

During operations, soils at the site became contaminated with heavy metals, volatile organic compounds, and other hazardous substances. These soils pose potential risks to human health via direct contact and generation of contaminated dust. Some heavy metals and volatile organic compounds have migrated into the ground water; there is a potential for heavy metals and PCB's to be transported off-site by surface water.

There is no immediate threat to human health or to the Renton well-field from the PACCAR site. The site does represent a low, long-term risk to human health and the environment. The following actions are planned to cleanup the site and mitigate the low, long term risk:

Soil: Soil with high levels of contamination will be removed and treated on-site. A small volume of soil which cannot be treated on-site will be removed and sent by truck to a permitted disposal facility.

Soil with low levels of contamination occurs over a wide area of the site. The quantity of soil and the low levels of contamination make excavation and treatment impracticable. The soil will be covered with structural fill to prevent direct contact with the soil and to prevent generation of contaminated dust.

Ground Water: Ground water at the site contains low levels of contamination which are decreasing. Cleanup of soil with high levels of contamination is expected to cause

contamination levels to further decrease, below Safe Drinking Water Act Maximum Contaminant Levels. The ground water will be monitored to ensure this decrease occurs. If it appears that contaminant levels will not decrease to below Maximum Contaminant Levels set by the Safe Drinking Water Act within a reasonable time frame, positive treatment measures will be taken to reduce contaminant levels.

Surface Water: Surface water leaving the site will be monitored to ensure that it meets state and federal water quality standards.

Sediment: Contaminated sediment in the main drainage ditch on the site will be excavated and disposed of off-site at a permitted facility.

Air Quality: Air quality will be monitored during the cleanup to ensure that airborne contaminates are not generated at the site. The structural fill cover placed to prevent direct contact with contaminated soil and to prevent generation of blowing dust will be inspected regularly to ensure that it has not been eroded or breached.

1. INTRODUCTION

1.1 PURPOSE

This document presents the Final Cleanup Action Plan (FCAP) for the PACCAR Defense Systems Site, Renton, Washington. It is documentation required by the site cleanup process established by the Washington Department of Ecology (Ecology) under Chapter 173-340 WAC, "Model Toxics Control Act--Cleanup Regulation", and meets requirements specified in WAC 173-340-360(10), "Draft Cleanup Action Plan".

The purpose of the FCAP is to:

- --- Summarize the alternative cleanup actions evaluated in PACCAR's Remedial Investigation/ Feasibility Study,
- --- Describe the cleanup action selected by Ecology from the alternative cleanup actions and the rationale used to select it, and
- --- Provide a document containing technical specifications for incorporation into the Consent Decree governing the cleanup actions.

1.2 SCOPE

The FCAP will first present the site description and history, then summarize the results of the remedial investigation and the risk assessment. The remedial investigation provided the data to complete the risk assessment. These studies are described in detail in "Remedial Investigation Report, PACCAR Site, Renton, Washington" (HartCrowser, 1989). They are summarized herein to provide background information pertinent to the remainder of the report.

Next, the FCAP will describe the alternative actions evaluated by PACCAR for cleaning up the site. These alternative actions are described in detail in the "Feasibility Study Report, PACCAR Site, Renton, Washington" (HartCrowser, 1990a).

Ecology's proposed action will then be presented and the rationale used to select the proposed action will be

discussed in terms of Ecology evaluation criteria for selecting cleanup actions at contaminated sites.

1.3 APPLICABILITY

This Cleanup Action Plan is applicable only to the PACCAR Defense Systems Site. Cleanup levels, hot-spot action levels, and cleanup actions have been developed as an overall remediation process being conducted under Ecology oversight, and should not be considered as setting precedents for other sites.

Numerical values for cleanup levels and, in particular, hot-spot action levels were set by considering many site-specific factors, including the facts that this site has been under Ecology oversight throughout the RI/FS process, that cleanup actions will be conducted under Ecology oversight, that a compliance monitoring plan will be implemented under Ecology oversight, and that institutional controls will be implemented through a consent decree entered into by Ecology and PACCAR.

Potentially Liable Parties (PLP's) cleaning up sites independently, without benefit of Ecology oversight, may not cite numerical values of cleanup levels and hot-spot action levels specified in this Cleanup Action Plan as justification for cleanup levels and/or hot-spot action levels, if appropriate, chosen for the PLP's site. PLP's cleaning up sites under Ecology oversight must base cleanup levels and hot-spot action levels, if appropriate, on site-specific regulatory considerations and not on numerical values contained in this CAP.

1.4 THE FCAP AND THE CLEANUP PROCESS

Figure 1.1 indicates documents required by the Model Toxics Control Act (MTCA) site cleanup process. The FCAP is one in a series of documents used by Ecology to monitor progress of site investigation and cleanup.

The RI/FS reports present the results of investigations into the nature and extent of contamination at a site, assesses the risk posed by that contamination, and evaluate the feasibility of alternative methods of cleaning up the site. The investigations, assessments, and evaluations were performed according to an Ecology approved work plan which was incorporated into a consent decree written under RCW

105B. The consent decree was entered in Superior Court after a public review and comment period.

PACCAR has completed the RI/FS investigations, assessments, and evaluations and submitted them in RI/FS reports to Ecology for review and comment. PACCAR's responses to Ecology's comments have been incorporated into the current versions of these reports or otherwise responded to in the references cited in Chapter 8.

The DCAP sets forth functional requirements which the cleanup must meet. That is, this document specifies the cleanup levels for environmental media (soil, ground water, surface water, sediment, and air) and indicates the remedial actions planned for media containing contamination above those levels. The DCAP is issues for public review and comment.

The FCAP is prepared from the DCAP after consideration of public comment on the DCAP. The FCAP's contents will be agreed to by PACCAR and Ecology in a consent decree, which is entered in court under RCW 105D. The consent decree will be a contractual agreement between PACCAR and Ecology for implementing the remedial actions discussed in the FCAP.

The Engineering Design Report and Construction Plans and Specifications provide the necessary technical drawings and specifications to allow a contractor to implement the methods described in the FCAP for cleaning up the site.

Construction documentation includes as-built drawings and documentation of any changes or modifications that were necessary during the course of implementing the remedial actions.

The Operation and Maintenance Plan presents technical guidance and regulatory requirements to assure effective operations under both normal and emergency conditions.

Compliance Monitoring Plans include: protection monitoring, to confirm that human health and the environment are adequately protected during construction and the operation and maintenance period of the cleanup action; performance monitoring, to confirm that cleanup actions have attained cleanup standards and other performance standards; and confirmational monitoring, to confirm the long-term effectiveness of the cleanup action.

1.5 ADMINISTRATIVE RECORD

The documents used to make the decisions discussed in this cleanup action plan constitute the administrative record. These documents are listed in Chapter 8, "References". References cited in the text are listed in Section 8.1. Additional references which were used in the decision process, but not cited in the text, are listed in Section 8.2.

Additional documents relating to the PACCAR Defense Systems Site may be found at Ecology's Northwest Regional Office, Bellevue, Washington.

2. SITE DESCRIPTION AND HISTORY

2.1 SITE LOCATION

PACCAR's Defense Systems Site is in the City of Renton, Washington, about 1/2 mile northeast of the downtown area. It is a level area of about 82 acres. The Cedar River is located about 2,000 to 3,300 feet to the southwest and west. Johns Creek and Lake Washington lie about 2,500 to 3,000 feet to the north and northwest. Both Johns Creek and the Cedar River flow into Lake Washington. Figure 2.1 shows the site location and regional study area.

2.2 SITE HISTORY

The facility opened in 1907 as Pacific Car and Foundry, operating a foundry and rail car manufacturing plant on the south 40 acres of the site. Over the years the facility expanded northward and eastward to cover the current 82 acres, with the last property acquisition occurring in the late 1960's. The company's name was changed to PACCAR Defense Systems in the early 1980's. At its peak, the facility employed about 2,100 workers engaged in building rail cars, Sherman tanks, and other military vehicles. It quit making rail cars in 1984. From 1984 to 1988, military vehicles, castings, forgings, and other industrial products were produced at the site. In 1988, manufacturing operations ceased and decommissioning of the plant began.

2.3 CURRENT STATUS

Facilities existing on-site at the time of cessation of manufacturing operations included a foundry; forge shop; machine shops; fabrication, storage, assembly, and painting buildings; railway spurs; and other support facilites. The equipment has been removed and most above-ground buildings and structures demolished and removed.

Most of the southern portion of the site is currently paved; the northern part of the site is covered with clean fill[1]. The site is drained to the north and west by a system of

[1]Clean fill at PACCAR is uncontaminated soil brought from offsite and placed above the existing soil to bring the elevation of low spots to the desired level and to provide a firm foundation for buildings and other facilities.

ditches, culverts, catch basins, and storm drains. The catch basins are connected to a storm drainage system beneath the site. Three drainage ditches, termed west, middle, and east ditches, are within the northern site area. Another drainage system drains the foundry area. Figure 2.2 shows the plant layout prior to demolition. Figure 2.3 shows the existing drainage system.

2.4 PAST ACTIVITIES OF ENVIRONMENTAL CONCERN

During facility operations, a variety of activities occurred at the site with the potential to have adversely affected environmental quality. These include:

- --- Industrial fill[2] containing heavy metals and other materials was deposited mostly on the northern half of the site. This practice was discontinued around 1962.
- --- Diesel fuel was stored in an above ground tank facility within the southwestern portions of the plant, in the vicinity of the former Monitoring Well LW-11 location. (Well locations are discussed in Section 3.2.)
- --- The plant was powered by diesel fuel until a natural gas system was installed in 1955. A buried pipeline feeder network was used to distribute the fuel. This network was generally within the southern half of the existing site.
- --- Fuels and solvents were used at the plant. These were stored in both above-ground and underground tanks. All of these tanks have been removed.
- --- Paint-spraying operations were conducted throughout the plant.
- --- Galvanizing was conducted in the 1940's and 1950's.

[2]Industrial fill at PACCAR is waste material from on-site industrial operations placed in low spots on the site for disposal.

--- Transformers containing PCB's were used on-site. All transformers and other electric equipment containing regulated PCB's have been removed.

2.5 INTERIM ACTIONS

Interim remedial actions have been undertaken by PACCAR on the Renton site. These include:

--- Removal of all underground storage tanks (done between 1985 and 1988).

--- Removal of electrical equipment containing PCB's (done between 1979 and 1990).

--- About 2,000 cubic yards of soil containing high concentrations of Total Petroleum Hydrocarbons (TPH's) and 10 cubic yards of soil containing lead were removed from the site during the Fall of 1987.

--- Water quality monitoring of ground water and surface water flows from the site has been conducted since 1986. Some locations have been monitored since 1984. An interim semi-annual monitoring program is in place.

--- Site access has been restricted.

--- Approximately 2500 cubic yards of soil containing high concentrations of TPH's, 5 cubic yards of soil containing arsenic, and 5 cubic yards of soil containing lead were excavated in the Summer and Fall of 1990. The soil containing TPH's is undergoing bioremediation as part of process development work for full-scale remediation. Biotreatment units were constructed and loaded in the Fall of 1990. Initial samples were taken. The units are being operated and sampled as weather allows. The units are covered and secured during adverse weather.

The soil containing arsenic was placed in a covered stockpile on-site for future treatment. The soil containing lead was hauled to a licensed hazardous waste disposal facility.

--- All asbestos-containing materials were removed from structures prior to their demolition. These materials were disposed of in accordance with applicable regulations.

--- All pits and sumps have been steam cleaned to remove TPH residues. The effluent was pumped out and sent off-site for treatment.

--- All sources of hazardous materials and wastes remaining on-site at the end of manufacturing operations have been removed.

2.6 FUTURE USE

The PACCAR site has been used for industrial operations since 1907, and is currently in an area zoned for heavy industry (City of Renton Zoning Code H-1). Future use of the site is planned to be for industrial or commercial operations.

As of May 1991, the possibility of constructing a new Kenworth truck plant on the north half of the site was under review by PACCAR. Approximately four of the forty acres comprising the north half of the site will be used for a parking lot for a new PACCAR Parts office building adjecent to the site.

Existing facilities which will continue to operate on-site include the General Automotive, Inc. offices and the Kenworth Research and Development Facility.

3. SUMMARY OF ENVIRONMENTAL ISSUES

3.1 METHODS OF INVESTIGATION

Data were collected by PACCAR and others to assess the hydrogeologic setting and environmental conditions on and in the vicinity of the site. The study area was bounded by the Cedar River to the west, Lake Washington to the north, Interstate 405 to the east, and the Renton well field to the south. The study area is shown in Figure 2.1

Data were obtained by reviewing past reports concerning the region, drilling borings, installing monitoring wells, excavating test pits, and sampling environmental media: soil, sediment, ground water, and surface water.

The environmental media samples were chemically analyzed for a wide range of chemicals (See Section 3.3).

The data were evaluated and comprehensive reports, the RI/FS reports (HartCrowser, 1989 and HartCrowser, 1990a), were prepared describing the results of the data evaluation in detail, assessing the risks posed by the concentrations of chemicals found, and evaluating feasible alternatives for remediating (cleaning up) the site.

Additional soil quality data has been collected as part of process development studies and additional water quality data has been collected as part of an interim water quality monitoring program. This data has also been used to provide the basis for selecting the cleanup action.

3.2 SITE GEOLOGY AND HYDROLOGY

The site is underlain by a layered and variable sequence of river-valley deposits comprised of clay, silt, sand, and peat with some gravel to a depth of over 100 feet. Several hundred feet of glacial and interglacial materials underlie the river-valley deposits. The general geology is summarized on Figure 3.1, which presents two cross sections depicting geologic conditions beneath the site. Figure 3.2 shows the locations of the sections, as well as the locations of other sections presented in the Remedial Investigation Report, monitoring wells, and surface water sampling stations.

The geologic sections, as well as hydrologic analyses, indicate that the principal aquifer in the area is contained within the river-valley deposits. Beneath the PACCAR site, the aquifer consists of relatively permeable layers of sand which are separated by lower permeability layers of silt and clay. The major sand layers of the aquifer have been termed the "upper sand unit" and the "lower sand unit". To the south of the site, the river valley deposits become coarser (more gravelly) and the lower permeability silt and clay layers thin and eventually disappear.

The coarser portions of the river-valley deposits make up the Cedar River Aquifer which provides water to some of the City of Renton's municipal water-supply wells. Renton also obtains water from wells and springs in the Highland areas and the Maple Valley golf course which are outside of any possible influence of the PACCAR site.

The nearest Renton municipal water supply well is located about 1,600 feet south of the PACCAR property. This well is currently active, but may be placed in reserve in the future. Other water supply wells which tap the Cedar River Aquifer are 2,100 to 2,600 feet south of the property.

Water level measurements made periodically since 1987 indicate that ground water, during portions of the year, flows generally west towards the Cedar River (termed Cedar River Catchment Area in this study) and generally south towards the Renton well field (termed Renton Well-Field Catchment Area in this study). The two catchment areas are separated by a groung-water divide, which is created by pumping the well field. When the divide is present, ground water beneath about 80 per cent of the site flows towards the Cedar River while the remaining 20 per cent flows towards the well field. When the divide is not present, typically during periods of high recharge and relatively low pumping rates, ground water beneath the entire site flows towards the Cedar River.

Figure 3.3 shows the site and the Cedar River and Renton Well Field Catchment areas. The shaded area shows the ground-water divide which separates the two areas.

The City of Renton conducted a well-field protection study to define the boundaries of an Aquifer Protection Area. These boundaries are shown on Figure 3.4. The Aquifer Protection area is divided into two parts, Zone 1 and

Zone 2. Water within Zone 1 has a travel time to the Renton Well Field of less than one year; water within Zone 2 has a travel time to the Renton Well Field of greater than one year. As can be seen on Figure 3.4, part of the north boundary of Zone 1 is on the south boundary of the site. The southeast part of the site is within Zone 2.

3.3 CHEMICALS OF CONCERN

PACCAR performed chemical analyses on soil, sediment[3], surface water, and ground water. Table 3.1 lists the 163 target analytes for which analyses were performed. The target analytes included all priority pollutants defined under CERCLA (Superfund), as well as some additional metals and organic screening parameters included to address site specific concerns and to focus the analytical efforts. The chemicals for which analyses were performed are divided into six groups: Metals and Inorganics, Organic Screening Parameters (which are not individual chemicals), Volatile Organic Compounds, Pesticides and PCB's, Semivolatile Compounds, and Other Parameters (which includes only pH).

Of the 163 target analytes, 92 were reported by a least one laboratory as detected in at least one sample collected on-site. These chemicals are shown with a • if detected in a soil or sediment sample, with a + if detected in a surface- or ground-water sample, and with a •+ if detected in both categories. Because of the relatively large number of detected chemicals, an initial screening of values was performed to identify those chemicals which contributed most (i.e., more than 99 per cent) to the potential site risk, consistent with current EPA risk assessment guidelines. The screening procedure compared the maximum concentration of each chemical observed within a given media with the most stringent risk-based criteria available. The most conservative exposure assumptions used by the EPA were incorporated in developing media-specific criteria for this initial screening. This screening procedure identified 26 chemicals for further study.

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[3]The term sediment refers to the material occurring beneath surface water bodies, such as lakes and streams. At PACCAR, sediment occurs beneath drainage ditches and a retention pond on the north end of the site.

Of the 26 identified chemicals, data validation efforts revealed that 3 of the chemicals had questionable detections: pentachlorophenol, di-n-butyl phthalate, and bis(2-ethylhexyl)phthalate. Pentachlorophenol was removed from the list of indicator contaminants because the presence of this constituent was not repeated in previous or subsequent sampling events. The phthalates were removed because they are common field and laboratory contaminants which are routinely detected in analytical blanks and were only detected intermittently. These three chemicals were removed from the list of chemicals of potential concern. Such removal is consistent with EPA guidelines for risk assessments.

The 23 remaining chemicals of potential concern, shown **bold and underlined** in Table 3.1, were addressed in the baseline risk assessment performed for the site (HartCrowser, 1989, Chapter 9).[4] The risk assessment identified 9 chemicals with upper-bound human health risks well below regulatory criteria (i.e., Hazard Index less than 1 or lifetime cancer risk less than one additional case in a population of one million). Ecological risks posed by these chemicals were also found to be low, relative to available criteria and ambient levels in the vicinity of the PACCAR site. These "low-risk" chemicals included 4 metals (copper, nickel, silver, and zinc), 4 volatile organic compounds (1,2-dichloroethane, ethylbenzene, toluene, and xylene), and 1 semivolatile organic compound (1,2-dichlorobenzene).

Thus, a total of 14 chemicals of concern were identified at the PACCAR Renton site. These chemicals are shown shaded, **bold and underlined** in Table 3.1.

Some of these chemicals exhibit similar environmental fates and toxicologic characteristics (i.e., carcinogenic polycyclic aromatic hydrocarbons (CPAH's) and polychlorinated biphenyls (PCB's), and thus are often appropriately addressed as groupings. Remedial Action Objectives (RAO's) for CPAH's and PCB's were developed for chemical included in these two groups of compounds. In all, a total of eight (8) individual chemicals or chemical groupings are of concern at PACCAR's Renton site. Table 3.2

[4]The Risk Assessment portion of the RI/FS was reviewed by personnel at the Washington State Department of Health.

summarizes the constituents of concern and indicates the media in which they were found.

A word of explanation is in order regarding polycyclic hydrocarbons nomenclature used in this report. Polycyclic aromatic hydrocarbons are compounds based upon three or more benzene rings. The RI/FS discusses four groupings of these compounds: low molecular weight polycyclic hydrocarbons (LPAH's), high molecular weight polycyclic hydrocarbons (HPAH's), carcinogenic polycyclic hydrocarbons (CPAH's), and total polycyclic hydrocarbons (TPAH's).

LPAH's include naphthalene, acenaphthylene, acenaphthene, fluorene, phenanthrene, anthracene, and 2-methylnaphthalene. None of the LPAH's have been identified by the EPA as suspected human carcinogens.

HPAH's include some compounds which have been identified by EPA as suspected human carcinogens based on weight of evidence derived from animal studies. The HPAH's detected on-site are listed below; those with a (B) in parentheses are suspected human carcinogens and comprise the CPAH's, a subset of the HPAH's.

Benzo(a)anthracene (B)
Benzo(a)pyrene (B)
Benzo(b)fluoranthene (B)
Benzo(k)fluoranthene (B)
Dibenzo(a,h)anthracene (B)
Indeno(1,2,3-cd)pyrene (B)
Chrysene (B)
Fluoranthene
Pyrene

TPAH refers to the sum of all of the polycyclic aromatic hydrocarbons for which analyses were performed at PACCAR's Renton site.

In later sections of this report the cleanup levels for the PAH's are expressed as CPAH's rather than HPAH's. The RI and FS reports discuss HPAH's. The change to CPAH's was done to be consistent with the derivation of cleanup levels in the MTCA, which became effective in February 1991.

Petroleum hydrocarbons were not identified by the risk assessment as posing a risk to those who might be exposed to soils. Most of the petroleum hydrocarbons in on-site soils consist of LPAH's, which do not pose the same risks as the CPAH's. In addition, at most locations where they occur, high concentrations of petroleum hydrocarbons in site soils

have not adversely affected site ground-water quality. Where ground water has been adversely affected by petroleum hydrocarbons, above-ground or underground tanks were present at one time. These tanks were mostly used to store fuels, solvents, and resins. All have been removed.

However, because relatively high concentrations of petroleum hydrocarbons were found in on-site soils in some areas, they were also identified as a chemical of potential concern. The petroleum hydrocarbons are referred to in the RI/FS as Total Petroleum Hydrocarbons (TPH).

3.4 RISKS TO HUMAN HEALTH AND THE ENVIRONMENT

3.4.1 Media of Concern

There are six media of concern which may pose risks to human health and the environment. These are contaminant sources, soil (which includes fill), ground water, surface water, sediment, and air.[5] Sources have been removed during interim actions and chemicals found on the PACCAR site are not causing air pollution, and air will not be further addressed, although air quality will be monitored during remedial construction activities. In addition, the site is currently covered with clean imported soil or pavement, making the generation of contaminated dusts unlikely.

3.4.1.1 Soil. Soil and fill materials on-site were found to contain metals, volatile organic compounds, semivolatile compounds, and PCB's.

Representative soil samples were primarily[6] analyzed for arsenic, cadmium, chromium, copper, lead, nickel, and zinc. These metals were used as indicators of metal contamination. Concentrations of metals in soils were found to be highest near the ground surface and to decline with increasing

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[5]Air is not commonly considered a medium to be cleaned up at contaminated sites. Air pollution is caused by contamination in one of the four media mentioned above, and if air pollution is an issue, it is resolved by cleaning up the medium causing the pollution.

[6]A complete listing of metals for which analyses were performed is given in Table 3.1.

depth. The highest metal concentrations were found to be associated with industrial fill materials.

Metal contamination in soils at the site was generally found to be "patchy" rather than uniform. The risk assessment found soils containing arsenic, lead, and chromium to pose the highest risks. Chromium and lead were often found together in contaminated areas associated with these two metals.

Volatile organic compounds detected in soils included constituents associated with fuels (benzene, toluene, ethylbenzene, and xylenes) and solvents (tetrachloroethene, trichloroethene, and 1,2-dichloroethane).

Semivolatile organic compounds detected in soils included LPAH's and HPAH's associated with fuel and with fill materials containing cinders, coal, and other rubble. Their concentrations decreased with depth.

TPH's were detected in soil, with the concentrations being highest near the surface and decreasing with depth. The highest concentrations were in the south part of the site, which is consistent with site history. High TPH concentrations result predominantly from historical diesel fuel spills and leaks.

PCB contamination is localized to areas where small spills occurred, and is generally low, less than 5.0 mg/kg. At one location a PCB concentration of 24 mg/kg was detected.

Maps showing the distribution of contaminants in soil are presented in Figures 6.1 through 6.69 of the Remedial Investigation Report (HartCrowser, 1989).

3.4.1.2 Ground Water. Dissolved lead, zinc, and arsenic were the only metals consistently detected in ground-water samples from shallow and deep monitoring wells tapping the aquifer. Table 3.3 summarizes on- and off-site concentrations and compares them with drinking water standards.

Concentrations of metals in most samples analyzed were found to be within two times the the lower detection limit of the analytical method (10 ug/L) for arsenic and lead) or within two times background (30 ug/L) for zinc. Samples containing

metals above these concentrations are considered to reflect ground water which has been affected by industrial fill.

Zinc was not found to be present in ground water at concentrations above either current or proposed drinking water standards.

Figures 3.5 through 3.8 summarize the distribution of lead and arsenic concentrations in ground water. Areas where concentrations of these metals exceeded standards are localized. Ground water beneath most of the site does not contain concentrations of lead or arsenic above drinking water standards.

Figures 3.9 and 3.10 summarize the distribution of volatile organic compounds in ground water. Total volatile organic compounds have been detected in on-site wells in concentrations ranging from not detected to 3 mg/L in the shallow aquifer and from not detected to 1 mg/L in the deep aquifer.

In off-site wells, the only volatile organic compound confirmed was vinyl chloride. Vinyl Chloride was detected in wells located west of the site in the Cedar River Catchment area. Vinyl chloride concentrations of 0.045 mg/L in well LMW-2D and 0.004 to 0.005 mg/L in well OSP-5D were measured. Well OSP-5D is further west of the site than well LMW-2D, and ground water flows westward, away from the site, in this area. This indicates that vinyl chloride concentrations decrease as the distance from the site increases.

The volatile constituents detected are indicative of fuels and solvents. The presence of vinyl chloride is likely due to the breakdown of chlorinated solvents which entered ground water and underwent chemical degradation with time. Extensive soil sampling data indicate that the original source material for the vinyl chloride is no longer present on the site in concentrations which pose a continuing threat to ground water. This finding is supported by soil and ground-water quality data. Out of 113 soil samples analyzed for volatile compounds only very low concentrations of solvents were detected and in only 4 samples. Ground-water quality data also indicate that concentrations of volatile compounds are declining in several wells. For example, in well LW-9D (See Figure 3.2 for well location), vinyl chloride has declined from a high of 0.120 mg/L in July 1986

to 0.013 mg/L in March 1991. In well LW-6D vinyl chloride has declined from a high of 0.08 mg/L in July 1986 to 0.024 in March 1991. These trends are shown on Figure 3.11. Additional monitoring will be conducted to confirm the trends.

Semivolatile organic compounds were not detected in ground water beneath most of the site. The highest concentrations were detected in samples adjacent to previous tank locations. The presence of high semivolatile concentrations in site soils, especially within the southern portion of the site, has not had a discernible influence on ground-water quality.

No semivolatile organic compounds were detected in off-site monitoring wells.

Neither pesticides nor PCB's were detected in ground water beneath the site with the exception of an early sampling round, where a low-level PCB concentration was detected in a sample from a single well, MW-2S, and several pesticides were reported to have been detected. Later sampling rounds did not confirm the presence of either the PCB's or the pesticides in this well.

3.4.1.3 Surface Water. Surface water samples were collected and analyzed from two locations: where runoff is collected and where it leaves the site (see Figure 2.2). The quality of runoff from the site is similar to or of better quality than that of runoff from local urban residential areas in Bellevue. Neither volatile organic compounds nor PCB's/pesticides were detected in these samples. Two phthalate compounds were detected at concentrations of 0.002 to 0.021 mg/kg. Copper, zinc, and, to a lesser degree, lead were detected in surface water samples at concentrations which periodically exceeded EPA recommended ambient chronic freshwater criteria. Sampling of surface water which leaves the site will be continued as part of a site water quality monitoring program.

3.4.1.4 Sediment. Sediment samples obtained from the bottom of two ditches which collect surface water flow detected a single volatile organic chemical, xylene at 0.02 mg/kg, and several semivolatile compounds, at concentrations less than 10 to 11 mg/kg. The PCB Arochlor 1254 was detected at 3.1 mg/kg in one sample. Additional ditch sediment samples taken in the Fall of 1990 detected the PCB

Arochlor 1254 at concentrations ranging from 0.53 to 2.0 mg/kg. Total lead, chromium, nickel, and zinc were detected and concentrations fell within a similar range as for site soil.

3.4.2 Baseline Risk Assessment

3.4.2.1 Toxicology of Chemicals of Concern. Toxicologically, chemicals may be divided into two classes: carcinogens, or cancer-inducing chemicals, and noncarcinogens, which may induce non-cancerous health effects.

Exposure to low levels of carcinogens over long time periods results in a risk of cancer to the exposed individual. The risk is statistical; of a group of individuals exposed to the same levels for the same length of time, some may get cancer and some may not, just as some smokers get cancer and some do not. Due to difficulties in extrapolating experimental studies on small populations (say, of laboratory rats) exposed to large doses of carcinogens to large populations exposed to small doses of carcinogens, it generally has not been possible to identify a safe level below which a carcinogen will not induce a cancer. Hence, the conservative assumption is made that any exposure carries some risk.

Noncarcinogens may produce chronic or acute health effects. Chronic effects occur over time, perhaps many years, with exposure to low concentrations of a noncarcinogen; acute affects occur immediately with exposure to greater concentrations.

Exposure to noncarcinogenic chemicals are generally recognized to be safe when below certain concentrations, known as a reference dose. Hence, occurrence of naturally-occurring chemicals such as lead, which is naturally present in the environment in small amounts, is recognized as safe as long as concentrations are below a certain level. For lead in drinking water this level is currently specified by the Safe Drinking Water Act as 50 ug/L. The EPA is currently proposing an action level for lead in drinking water of 15 ug/L.

The EPA classifies chemicals as known or suspected carcinogens. Regarding the chemicals of concern at PACCAR, arsenic, chromium, and hexachlorobenzene are known

carcinogens with noncarcinogenic health effects as well. Benzene and vinyl chloride are known carcinogens and the CPAH's are suspected carcinogens. The EPA is currently developing toxicity data to assess the carcinogenicity of lead.

3.4.2.2 Exposure Pathways. Six possible public health exposure pathways were assessed for the PACCAR site based on possible migration pathways and routes of exposure:

- Dermal contact by on-site workers,
- Incidental soil ingestion by on-site workers,
- Inhalation of dusts and vapors by on-site workers and off-site receptors,
- Consumption of drinking water from the Renton Aquifer production wells or hypothetical domestic wells;
- Consumption of fish harvested from the Cedar River or Lake Washington, and
- Water-related recreational activities in nearshore areas of Lake Washington.

Environmental risks were assessed for off-site migration of contaminants into Johns Creek via surface water flow. Water quality data from the site was compared to environmental criteria and the quality of runoff from urban residential areas. The relative contribution of the PACCAR site, as compared to surrounding areas, was considered.

3.4.2.3 Overall Assessment. The baseline risk assessment conducted as part of the Remedial Investigation (HartCrowser, 1989) indicates that under the baseline conditions used to complete the risk assessment, the PACCAR site poses a low, but long-term risk to human health and the environment. As indicated in Tables 9.8 and 9.9 of the RI report (HartCrowser, 1989, pp. 9-49 and 9-50), average noncarcinogenic risk is characterized by hazard indices below 0.1, compared to the maximum hazard index criterion of 1.0 specified by both the EPA and by Chapter 173-340 WAC.

As indicated in Table 9.10 of the RI report (HartCroswer, 1989, p. 9.51), carcinogenic risks under baseline conditions

at the PACCAR site average 1.8 x 10^{-5} (1 in 55,000), with a cumulative 95th percentile probabilistic upper bound of 8.9 x 10^{-5} (1 in 11,000). These risks exceed the maximum carcinogenic risk specified under Chapter 173-340 WAC of 1 x 10^{-5} (1 in 100,000).

The baseline risk assessment was completed prior to interim actions taken by PACCAR as part of the cleanup process, so the risks today are less than those identified by the risk assessment. Additional actions to be taken as discussed in this document will achieve full protection of human health and the environment as defined by Chapter 173-340 WAC by brininging the maximum carcinogenic risk for the PACCAR site below 1 x 10^{-5}.

Arsenic, lead and chromium, CPAH's, and PCB's are the principal contaminants of concern. Although not specifically identified by the risk assessment, soils contaminated with high concentrations of TPH's are also of concern.

Conservative exposure assumptions were used to develop the risk assessment. Carcinogenic and non-carcinogenic risks posed by soil contaminants were found to be within acceptable guideline ranges set by the EPA. Increased cancer risks under baseline conditions are less than 1 additional case in a population of 10,000, the risk level the EPA uses as acceptable for industrial sites. Non-carcinogenic risks were found to have a hazard index less than 1.0, indicating chemicals posing non-carcinogenic toxic risks are present in concentrations below the acceptable chronic exposure dose.

Most of the carcinogenic risk calculated in the baseline risk assessment is from oral or dermal contact with HPAH's (26%) and inhalation of chromium (51%) and arsenic (15%) dusts. The actual risks are lower than those estimated because:

-- It was assumed that all chromium detected on-site is hexavalent, the most hazardous form. Available data indicates that this form of chromium comprises only a small percentage of the chromium detected on-site.

-- It was assumed that surface soils are exposed and the potential exists for creating dust containing chromium

and to a lesser extent arsenic. In fact, about half the site is paved and the remaining areas have been covered with clean fill which effectively prevents the creation of metal-containing dusts.

Under the conservative assumptions used in the risk assessment, carcinogenic risks are estimated to range between 0 and 1 additional cases in a population of about 170,000 for oral/dermal contact and between 0 and 1 additional cases for a population of 83,000 for inhalation. The combined cumulative average condition risk is estimated to be 0 to 1 additional cases in a population of 55,000.

Interim guidance from the EPA (CDC, 1985 and EPA, 1989c)was used for developing a remediation level for lead. The interim guidance indicates that lead remediation levels for residential areas should range between 500 and 1,000 ppm. EPA Region 10, which includes Washington, and the Washington State Department of Health have applied the 1,000 ppm value of the interim guidance range for residential areas to industrial sites. Although the average concentration of lead in soils at the PACCAR site is less than 1,000 ppm, some areas exceed 1,000 ppm.

Contaminant migration from the PACCAR site to the City of Renton municipal well field presents a low, long-term risk because only a small percentage (less than 1%) of the ground-water flow which is captured by the well field is derived from beneath the PACCAR site. No organic chemicals which are attributable to the PACCAR site have been detected on or downgradient of the PACCAR site within the well-field capture area. Several metals have been detected, but at concentrations which generally meet existing and proposed water quality standards. Lead has been detected in several shallow well samples at concentrations below the proposed drinking water standard (up to 7 ug/L as compared to the proposed standard of 15 ug/L).

The risk assessment presented in the remedial investigation identified copper, nickel, lead, chromium, and zinc as being of potential concern in surface water which migrates off the PACCAR site. Although the quality of surface water is similar to general urban areas, available surface water quality data collected as part of the RI and the interim water quality monitoring program indicate that surface water, at times, has exceeded ambient criteria for copper, nickel, lead, chromium, and zinc. These exceedences are

thought to occur by erosion and particulate migration of industrial fill soils on-site. One of the goals of the preferred remedial alternative is to prevent particulate migration. Prevention of particulate migration is expected to result in surface water meeting ambient criteria.

In summary, current site conditions pose a low, but long-term risk to human health and the environment. Risks associated with soil are mainly from absorption of chemicals from soil on people's skin (dermal exposure), ingestion (such as eating a sandwich with dirty hands), and inhalation of dust.

Risks associated with ground water are associated with the potential for migration of contaminants to the Renton well field.

Storm water from the site contributes about 10% of the drainage flow within the North Renton Drainage Basin, based on area. Most of the flow is into Johns Creek and Lake Washington. Environmental risks do not exceed those caused by migration of storm water from urban areas based on limited testing of surface water migrating off-site.

Risks associated with sediments, not mentioned above, are mainly from PCB contamination. Sediment remediation will involve removal of PCB-contaminated sediments from the site; placing a geotextile fabric to mark the extent of excavation and to prevent erosion of the underlying soil; and placing clean fill on top of the geotextile to bring the bottom of the area of removal back up to the appropriate grade.

3.5 REMEDIAL ACTION OBJECTIVES

Remedial Action Objectives (RAO's) in the Feasibility Study Report (HartCrowser, 1990a) were developed by PACCAR in accordance with EPA proposed revisions to the National Contingency Plan (NCP) (53 Federal Register 51394) and the draft EPA guidance document, "CERCLA Compliance with Other Laws Manual", dated August 8, 1988. These documents include procedures for establishing RAO's in feasibility studies of Superfund sites.

According to the proposed NCP revisions, the RAO's should specify the contaminants and media of concern, potential exposure pathways, and preliminary remediation goals. These initial RAO's were later modified to be consistent with the

MTCA. A discussion of the RAO's developed prior to MTCA is presented below, followed by a discussion of the selection of cleanup levels.

Section 121(d) of the Superfund Amendments and Reauthorization Act of 1986 (SARA) requires that remedial actions at Superfund sites attain the "applicable or relevant and appropriate requirements" (ARAR's) of federal and state environmental laws. The Model Toxics Control Act[7] (MTCA) requires that remedial actions meet remediation standards at least as stringent as those under Section 121(d) of SARA (RCW 70.105D.030(2)(d)) and that "the department [of Ecology] shall give preference to permanent solutions to the maximum extent practicable and shall provide for or require adequate monitoring to ensure the effectiveness of the remedial action" (RCW 70.105D.030(1)(b)).

A detailed discussion of the development of the intital RAO's is presented in Section 3 of the Feasibility Study Report (HartCrowser, 1990a). The RAO's were developed for chemicals of concern identified in the baseline risk assessment. ARAR's formed the basis for a specific RAO when available. When ARAR's were not available, or when the available ARAR's were clearly not adequate to protect human health or the environment, the risk assessment formed the basis to develop a specific objective. To-be-considered (TBC) policies and guidance were evaluated along with the risk-based analyses.

RAO's were developed for both soil and water based on ARAR's, TBC's, and the risk assessment. The overall site RAO's were developed according to EPA guidelines and are summarized in Table 3.4.

Table 3.5 presents concentration levels required to meet RAO's for chemicals of concern in soil at PACCAR's Renton site. Hexachlorobenzene, which was a chemical of concern, was not considered for a RAO as its maximum on-site soil

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[7]The Model Toxics Control Act is referred to variously as Initiative 97, Chapter 2, Laws of 1989, and Chapter 70.105D RCW. All refer to the same legislation, the Act which was passed as Initiative 97 in the November 1988 election and which became law in March 1989. It will be referred to in this document by its acronym, MTCA.

concentration is less than the average cleanup concentration identified in the risk assessment and it was only detected in 2 of 186 samples analyzed (HartCrowser, 1990b). Hence, cleanup of hexachlorobenzene is not necessary.

The initial RAO's and concentration levels were developed prior to the promulgation of cleanup standards in Chapter 173-340 WAC, "Model Toxics Control Act Regulation". Since promulgation of the regulation, cleanup levels have been developed which meet the standards of WAC 173-340 Part VII, "Cleanup Standards". The MTCA cleanup levels are presented in Section 3.6.

3.6 MEDIA CLEANUP LEVELS

3.6.1 Selection of Method for Establishing Cleanup Levels

Chapter 173-340 WAC, "Model Toxics Control Act Cleanup Regulation" provides three basic methods for establishing cleanup levels. The three basic methods are Method A, Method B, and Method C. Method A applies to routine sites[8]; Method B is the standard method and applies to all sites; and Method C applies to sites where compliance with cleanup levels developed under either Method A or Method B may be impossible to achieve or may cause greater environmental harm.

PACCAR is not considered a routine site because it is a large, complex site and there is not an obvious and limited choice among cleanup methods. Hence, it is not eligible for a Method A cleanup. Method C is not applicable either, because compliance with Method B cleanup levels are not impossible to achieve and will not cause greater environmental harm than not achieving them. Hence, Method B

[8]A routine site is one for which a cleanup action involves an obvious and limited choice among cleanup methods, uses a cleanup method that is reliable and has proven capable of accomplishing cleanup standards, involves obvious and undisputed cleanup standards for each hazardous substance addressed by the cleanup, uses cleanup methods with which the department has experience, and does not require an environmental impact statement. Sites requiring cleanup of ground water are not normally considered routine sites.

will be used to establish cleanup levels for PACCAR's Defense Systems Site.

It is important to understand the relationship between cleanup levels and the selection of cleanup actions. As discussed in WAC 173-340-700(2), "Cleanup standards versus selection of cleanup actions":

> "WAC 173-340-700(2)(a) Cleanup standards are identified for the particular hazardous substances at a site and the specific areas or pathways, such as land or water, where humans and the environment can become exposed to these substances. This part provides uniform methods state-wide for identifying cleanup standards and requires that all cleanups under the act meet these standards. The actual degree of cleanup may vary from site to site and will be determined by the cleanup action alternative selected under WAC 173-340-360. Establishing cleanup standards for individual sites requires the specification of the following:
>
> (i) Hazardous substance concentrations that protect human health and the environment ('cleanup levels');
>
> (ii) The location on the site where those cleanup levels must be attained ('points of compliance'); and
>
> (iii) Additional regulatory requirements that apply to a cleanup action because of the type of action and/or the location of the site. These requirements are specified in applicable state and federal laws and are generally established in conjunction with the selection of a specific cleanup action.
>
> "WAC 173-340-700(2)(b) For most sites, there are several cleanup technologies or combinations of cleanup technologies ('cleanup action alternatives') that may be used to comply with cleanup standards at individual sites. Other parts of this rule govern the process for planning and deciding on the cleanup action to be taken at a site. For example, WAC 173-340-350 (State remedial investigation and feasibility study) (RI/FS) specifies the studies that are prepared to define the nature and extent of contamination ('RI') and to identify and evaluate cleanup action alternatives('FS'). WAC 173-340-360 (Selection of cleanup actions) specifies the criteria

for selecting the preferred alternative. WAC 173-340-410 specifies the monitoring required to assure that the remedy is effective.

"(c) The department recognizes that cleanup actions selected under WAC 173-340-360 may involve containment of hazardous substances. In these cases, the cleanup action may be determined to comply with cleanup standards, provided the compliance monitoring program is designed to ensure the long-term integrity of the containment system, and the other requirements for containment technologies in WAC 173-340-360(8) are met."

3.6.2 Ground-Water Cleanup Levels

Ground-water cleanup levels were set according to WAC 173-340-720, "Ground Water Cleanup Standards". The process for establishing Method B cleanup levels for ground water is specified in WAC 173-340-720(3). This section indicates that:

"WAC 173-340-720(3)(a) Where the ground water is a current or potential future source of drinking water, method B cleanup levels shall be at least as stringent as all of the following:

(i) Concentrations established under applicable state and federal laws, including the requirements in subsection (2)(a)(ii) of this section [which references 40 CFR 141, the Safe Drinking Water Act (SDWA) and Chapter 248-54 WAC, maximum contaminant levels established by the state board of health];

(ii) For hazardous substances for which sufficiently protective, health-based criteria or standards have not been established under applicable state and federal laws, those concentrations which protect human health as determined by the following methods:

(A) Concentrations which are estimated to result in no acute or chronic toxic effects on human health ...

(B) For known or suspected carcinogens, concentrations for which the upper bound on the

> estimated cancer risk is less than or equal to 1 in 1,000,000 ...
>
> "WAC 173-340-720(3)(b) The department may establish method B cleanup levels that are more stringent than those required by subsection (3)(a) of this section, when, based on site-specific evaluations, the department determines such levels are necessary to protect human health and the environment. This may include the following:
>
> (i) Concentrations which are necessary to protect sensitive subgroups;
>
> (ii) Concentrations which eliminate or minimize the potential for food chain contamination;
>
> (iii) Concentrations which eliminate or minimize the potential for damage to soils or biota in the soils which could impair the use of the soil for agricultural or silvicultural purposes;
>
> (iv) Concentrations which eliminate or minimize the potential for the accumulation of vapors in buildings or other structures to concentrations which pose a threat to human health or the environment; and
>
> (v) Concentrations which protect nearby surface waters. In general, these will be based on attaining surface water cleanup levels in the surface water as close as technically possible to the point or points where the ground water flows into the surface water.
>
> "WAC 173-340-720(3)(c) Method B cleanup levels to protect beneficial uses of ground water other than drinking water shall be established by the department on a case-by-case basis.

Ground water cleanup levels have been set at the PACCAR site using the process indicated in WAC 173-340-720(3)(a) above.

With respect to WAC 173-340-720(3)(b), the department has determined, based upon the risk assessment presented in HartCrowser, 1989, that cleanup levels more stringent than

those in WAC 173-340-720(3)(a) are not required for ground water beneath PACCAR's site.

With respect to WAC 173-340-720(3)(c), the highest beneficial use of ground water is considered to be drinking water and the reasonable maximum exposure is exposure to hazardous substances via ingestion of drinking water and other domestic uses. This is consistent with criteria established in WAC 173-340-720(1)(a). Hence, WAC 173-340-720 does not apply.

Table 3.6 presents the ground-water cleanup levels, the hazard index and excess cancer risk for each chemical at its cleanup level and the basis for setting the cleanup level.

The cleanup levels for individual chemicals were set using Method A values specified in WAC 173-340-720(2)(a)(i). Method A values are considered sufficiently protective, health-based criteria or standards.

For multiple chemicals, WAC 173-340-720(5) specifies that the hazard index shall not exceed one (1) and the total excess cancer risk shall not exceed one in one hundred thousand (1×10^{-5}). As Table 3.6 shows, the only chemical for which a hazard index is applicable is arsenic, and the hazard index is 0.3, which meets MTCA criteria. Arsenic, benzene, and vinyl chloride are carcinogens.

The cleanup level for arsenic has been established at natural background concentrations. The Department recognizes that such naturally-occurring levels may pose some level of cancer risk (i.e., using the standard risk assessment procedures, background levels of arsenic are associated with an estimated risk of 1×10^{-4} (one in ten thousand). However, cleanup requirements for the PACCAR site are based on the estimated risk of cancer above that associated with natural background levels (i.e., excess cancer risk). Hence, the arsenic cleanup level (background concentration) is associated with an excess cancer risk of zero.

The Method B ground-water cleanup level for benzene is 0.005 mg/L, which is equal to the Maximum Concentration Limit (MCL) set by the SDWA (40 CFR 141). Using the procedures and exposure assumptions in WAC 173-340-720(3)(a)(ii)(B), this concentration is associated with an estimated

incremental cancer risk of 0.3×10^{-5} (0.3 in one hundred thousand).

The Method B ground-water cleanup level for vinyl chloride is 0.0004 mg/L. This level is based upon a separate evaluation of the ingestion and inhalation routes of exposure using the procedures and assumptions in WAC 173-340-720(3)(a)(ii)(B), WAC 173-340-720(7), and the EPA carcinogenic potency factors of 2.3 and 0.295 $(mg/kg\text{-}day)^{-1}$ for ingestion and inhalation, respectively. In estimating inhalation risks, it was assumed that daily exposure levels via inhalation were equivalent to exposure levels via ingestion. The excess cancer risks associated with the two routes of exposure were assumed to be additive [See WAC 173-340-708(5) and (6)].

The total excess cancer risk of vinyl chloride and benzene at cleanup level concentrations is 1×10^{-5} and 0.3×10^{-5}, which totals 1×10^{-5} when the total is expressed to one significant figure, as required by WAC 173-340-708(12).

Neither a verified oral reference dose nor a cancer potency factor is available for lead, so calculation of the associated hazard index and risk is not possible. The cleanup level of 0.005 is based upon state and federal law and epidemiological studies, and adjusted to meet the Maximum Contaminant Limit Goal for lead currently being proposed by EPA's Office of Drinking Water.

As will be discussed in Chapter 5, the cleanup actions will involve ground-water source controls through hot-spot soil treatment. However, some hazardous substances will remain on-site at concentrations above the cleanup levels. Hence, a conditional point of compliance will be established at the PACCAR site. This conditional point of compliance is the site boundary, and extends vertically from the uppermost level of the saturated zone to the lowest most depth which could potentially be affected by the site.

A ground-water monitoring plan will be prepared which meets the requirements of WAC 173-340-410, "Compliance Monitoring Requirements".

3.6.3 Surface Water Cleanup Levels

Surface water cleanup levels were set according to WAC 173-340-730, "Surface Water Cleanup Standards. The process for establishing Method B cleanup levels for surface water is specified in WAC 173-340-730(3). This section indicates that:

> "WAC 173-340-730(3)(a) Method B cleanup levels for surface waters shall be at least as stringent as all of the following:
>
> (i) Concentrations established under applicable state and federal laws, including the following requirements:
>
> (A) All water quality criteria published in the water quality standards for surface waters of the state of Washington, Chapter 173-201 WAC, as amended; and
>
> (B) Water quality criteria based on the protection of aquatic organisms (acute and chronic criteria) and human health published pursuant to section 304 of the Clean Water Act unless it can be demonstrated that such criteria are not relevant and appropriate for a specific surface water body or hazardous substance.
>
> (ii) Concentrations which are estimated to result in no adverse effects on the protection and propagation of wildlife, fish, and other aquatic life;
>
> (iii) For hazardous substances for which sufficiently protective, health-based critera or standards have not been established under applicable state and federal laws, those concentrations which protect human health as determined by the following methods:
>
> (A) For surface waters which support or have the potential to support fish or shellfish populations, concentrations which are anticipated to result in no acute or chronic toxic effects on human health ...
>
> (B) For surface waters which support fish or shellfish populations, concentrations which are anticipated to result in an excess cancer risk less than or equal to 1 in 1,000,000 ...

(C) For surface waters which represent a source or potential future source of drinking water, concentrations which are anticipated to result in no adverse impacts on human health as established in accordance with WAC 173-340-720(3).

"WAC 173-340-730(b) The department may establish method B cleanup levels more stringent than those required by subsection (3)(a) or this section, when, based on site-specific evaluations, the department determines that such levels are necessary to protect human health and the environment.

With respect to WAC 173-340-730(3)(b), the department has determined, based upon the risk assessment presented in HartCrowser, 1989, that cleanup levels more stringent than those in WAC 173-340-730(3)(a) are not required for surface water leaving PACCAR's site.

Table 3.7 presents the surface water cleanup levels based on the prevention of chronic aquatic life toxicity. The aquatic life criteria established under Section 304 of the Clean Water Act and WAC 173-201 are considered sufficiently protective, health-based criteria for protection of human health and the environment for storm water leaving the site which does not support fish or shellfish populations. Hazard indices and excess cancer risks calculated based on WAC 173-340-730(3)(a)(iii) are well below the specified maximum levels.

The point of compliance will be the point or points where surface waters collected from the PACCAR site are discharged across the site boundary, whether through surface ditches or storm drains. Any water discharged through a sanitary sewer must meet permit requirements of Metro and any other appropriate local agency.

A surface water monitoring plan will be prepared which meets the requirements of WAC 173-340-410, "Compliance Monitoring Requirements".

3.6.4 Soil Cleanup Levels

Two sections of the Model Toxics Control Act Regulation provide processes by which soil cleanup levels may be set: WAC 173-340-740, "Soil Cleanup Standards" and WAC 173-340-745, "Soil Cleanup Standards for Industrial Sites".

However, WAC 173-340-745(1)(c) requires that, for a site to be considered an industrial site, adjacent properties must be currently used or designated for use for industrial purposes. Since the PACCAR site has a residential area to the south and has commercial, rather than industrial properties, on other boundaries, it cannot be considered and industrial site. Hence, soil cleanup levels will be set using WAC 173-340-740.

WAC 173-340-740 classifies three types of future site uses for purposes of setting cleanup levels. The base case is residential site use, requiring the most restrictive cleanup levels. In addition, a site which does not qualify as an industrial site under WAC 173-340-745 may qualify as an industrial/commercial site. However, to qualify as an industrial/commercial site, properties adjacent to and in the general vicinity of the site must be used for industrial/commercial purposes. This is not the case for PACCAR due to the aforementioned residential area to the south. WAC 173-340-740(1)(c) indicates that for industrial sites not qualifying as either industrial or industrial/commercial, cleanup levels will be established using residential site conditions as the reasonable maximum exposure scenario.

The process for establishing Method B cleanup levels for soil is specified in WAC 173-340-740(3). This section indicates that:

> "WAC 173-340-740(3)(a) Method B cleanup levels for soils shall be at least as stringent as all of the following:
>
> (i) Concentrations established under applicable state and federal laws;
>
> (ii) Concentrations which will not cause contamination of ground water at levels which exceed Method B ground water cleanup levels established under WAC 173-340-720 as determined using the following criteria:
>
> (A) For individual hazardous substances or mixtures, concentrations that are equal to or less than one hundred times the ground water cleanup level established in accordance with WAC 173-340-720 unless it can be demonstrated that a higher soil concentration is protective of ground water at the site.

(B) For total petroleum hydrocarbons, the person undertaking the cleanup may elect to make this demonstration on the basis of data on individual hazardous substances that comprise the total petroleum hydrocarbons.

(iii) For those hazardous substances for which health-based criteria or standards have not been established under applicable state and federal laws, those concentrations which protect human health and the environment as determined by the following methods:

(A) Concentrations which are estimated to result in no acute or chronic toxic effects on human health via direct contact with contaminated soil ...

(B) Concentrations for which the upper bound on the estimated excess cancer risk is less than or equal to 1 in 1,000,000 via direct contact with contaminated soil ...

(iv) To assure that unacceptable risks do not result from inhalation of hazardous substances in or released from contaminated soils, soil concentrations which ensure that releases of hazardous substgances shall not result in ambient air concentrations which exceed Method B cleanup levels established under WAC 173-340-750.

"WAC 173-340-740(3)(b) The department may establish Method B cleanup levels that are more stringent than those required under (a) of this subsection, when, based on a site-specific evaluation, the department determines that such levels are necessary to protect human health or the environment ... "

With respect to WAC 173-340-740(3)(b), the department has determined, based upon the risk assessment presented in HartCrowser, 1989, that cleanup levels more stringent than those in WAC 173-340-740(3)(a) are not required for soil at PACCAR's site.

Table 3.8 presents the soil cleanup levels and Figure 3.12 shows the approximate extent of soil contamination exceeding these cleanup levels. The cleanup levels have been set according to Method A values for soil specified in WAC 173-340-740(2). These values are considered appropriate

concentrations under applicable state law (the Model Toxics Control Act) for the PACCAR site, and are set based upon WAC 173-340-740(1)(d), quoted above, as concentrations established on a case-by-case basis for a site for which residential site use conditions do not represent the maximum exposure scenario; i.e., a nonresidential site which does not qualify as an industrial/commercial site under WAC 173-340-740(1)(c). The appropriateness of Method A values for soil cleanup concentrations at PACCAR is for reasons discussed in footnote (a) to Table 2 of WAC 173-340-740(a)(i). First, Method A values are intended to provide conservative cleanup levels for sites undergoing routine cleanups. Second, exceedences of Method A values do not necessarily trigger requirements for cleanup action under Chapter 173-340 WAC. These statements clearly establish that Method A values are considered by Ecology to be sufficiently conservative to be protective, health-based criteria or standards. Hence, Method A values are the lowest cleanup levels which should be established for hazardous substances for which Method A values have been developed, although subsequent adjustments may have to be made to account for multiple hazardous substances on a site and for multiple pathways of exposure.

The reasons why Method A values are considered sufficiently protective, health-based criteria are given in footnotes to Table 2, Method A Cleanup Levels - Soil (WAC 173-340-740(2)(a)(i):

Arsenic. Cleanup level based on background concentrations in the state of Washington. Since the cleanup level is set at background, there is no excess cancer risk, as discussed in Section 3.6.2.

Chromium. Cleanup level based on health risks associated with inhalation of resuspended dust. The calculated excess cancer risk associated with 100 mg/kg chromium is approximately one in one million (0.1×10^{-5}).

Lead. Cleanup level based on preventing unacceptable blood lead levels.

CPAH. Cleanup Level based on Method A value in Table 2 of WAC 173-340-740(2)(a)(i). Using the procedures in WAC 173-340-740(3)(a)(iii)(B), this level is associated with an estimated excess cancer risk of one in one hundred

thousand (1×10^{-5}). The calculated excess cancer risk associated with 1 mg/kg total CPAH's is approximately 0.6×10^{-5}). Given the types of hazardous substances at the site and the spatial distribution of those substances in site soils, the Department has determined that it is not necessary to adjust this value downward to ensure that the total excess cancer risk does not exceed 1×10^{-5}.[9]

PCB's. Cleanup Level based on Method A value in Table 2 of WAC 173-340-740(2)(a)(i). Using the procedures in WAC 173-340-740(3)(a)(iii)(B) and an absorption factor of 0.3 (30 per cent), this level is associated with an estimated excess cancer risk of 0.3×10^{-5}. A 30 per cent absorption factor is recommended for use at Superfund sites by EPA (1990b). The calculated cancer risk associated with 1 mg/kg PCB's is approximately 0.3×10^{-5}. Given the types of hazardous substances at the site and the spatial distribution of those substances in site soils, the Department has determined that it is not necessary to adjust this value downward to ensure that the total excess cancer risk does not exceed 1×10^{-5}.[9]

TPH (gasoline), TPH (diesel), and TPH (other). Cleanup levels based on protection of ground water. Values were set for gasoline, diesel, and other petroleum hydrocarbons because all are present on-site. Figure 3.12 shows the extent of TPH contamination above 200 mg/kg based on analyses performed by EPA Method 418.1.

The total hazard index is less than one (1). The cumulative (i.e., combined chromium, CPAH, and PCB exposure) excess cancer risk does not exceed one in one hundred thousand (1×10^{-5}).

The point of compliance for soil cleanup based on human exposure by direct contact is discussed in WAC 173-340-740(6). Subsection (d) of that section indicates that for sites where containment is selected under WAC 173-340-360, a compliance monitoring program must be designed to ensure the long-term integrity of the containment system. Since

[9]As indicated on Figure 3.12, there is little overlap in the areal distribution of CPAH and PCB contamination. Consequently, it is inappropriate to add risks due to these chemicals together.

containment will be used at PACCAR, long-term monitoring and institutional controls will be implemented to assure the integrity of the cover.

3.6.5 Sediment Cleanup Standards

Sediment cleanup standards have not been promulgated under Chapter 173-340 WAC. Cleanup levels for sediments are set as the same as those for soil and are presented in Table 3.8.

The point of compliance for sediments is established in the sediments throughout the site.

3.6.6 Multiple Pathways of Exposure

WAC 173-340-708(5) and (6) specify that cleanup levels shall be adjusted downward to take into account exposures from more than one exposure pathway. The hazard index for noncarcinogens is not to exceed one (1) and the total excess cancer risk is not to exceed one in one hundred thousand. The cleanup levels for this site meet this criteria.

4. SUMMARY OF ALTERNATIVE CLEANUP ACTIONS

4.1 INTRODUCTORY REMARKS

This chapter summarizes alternative cleanup actions considered by PACCAR in the Feasibility Study (HartCrowser, 1990a) and indicates the response actions proposed in that study. The development and analysis of the alternative actions was performed in accordance with EPA guidance prior to promulgation of the Chapter 173-340 WAC, "Model Toxics Control Act Cleanup Regulation". The purpose of this chapter is to summarize the alternative cleanup actions considered and to discuss the relationship of the site to the federal clanup law (CERCLA).

Chapter 5 will discuss the selection of the cleanup actions to be taken based on the method for selecting cleanup actions required by WAC 173-340-360, "Selection of Cleanup Actions". The method's requirements are consistent with federal requirements. Hence, actions selected under WAC 173-340-360 will comply with Federal regulations as well as State regulations.

4.2 GENERAL RESPONSE ACTIONS

General response actions are categories of remedial measures which may be used to reduce the exposure of humans and the environment to contaminants. The goal of such measures is to reduce the mobility, toxicity, or volume of contaminants.

Separate sets of general response actions to remediate ground water, soil, and sediments at PACCAR were identified during the Feasibility Study (HartCrowser, 1990a). General response actions were not developed for surface water because the response actions for soil and sediment will remediate contaminants which could impact surface water.

The general response actions considered were:

- **Groundwater**
  - Baseline condition with monitoring[10]

[10]Baseline condition with monitoring consists of monitoring of the current site conditions with no remedial

(continued...)

- Institutional controls
- Diversion/containment
- Pump and treat
- In situ treatment

o Soil
- Baseline condition with monitoring[9]
- Institutional controls
- Containment/isolation
- Surface water collection and control
- Excavation and disposal
- Excavation and treatment
- Excavation and stabilization
- In situ stabilization

o Sediment
- Baseline condition with monitoring[9]
- Institutional controls
- Containment/isolation
- Excavation and disposal

4.3 REMEDIAL ALTERNATIVES

Preliminary Remedial Alternatives which could accomplish each of the general response actions listed in Section 4.2 were identified from Superfund guidance documents[11], standard engineering practices, current literature on new technologies, and technology vendors.

The alternatives selected for preliminary evaluation are listed in Table 4.1. These technologies were then evaluated using three criteria to identify those to be retained for detailed analysis. These criteria are:

(1) **Effectiveness** - The ability of the process option to handle the area and volume of contaminated

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[10](...continued)
activities performed. It is a comparison condition used for evaluation of other proposed alternatives and is included in all feasibility studies for federal Superfund sites.

[11]Superfund guidance documents are documents published by the EPA to provide guidance on remediating contaminated sites.

material; its ability to meet the remedial action objectives; protection of human health and the environment during the construction and implementation phase; and how proven and reliable is the process option.

(2) **Implementability** - The ability to obtain permits for off-site activities; the availability of treatment, storage, and disposal services; and the availability of equipment and skilled workers.

(3) **Cost effectiveness** - Relative to other options within a technology type; includes the capital and operations costs.

Evaluation of the preliminary remedial alternatives is described in more detail in Feasibility Study Chapter 5, "Development and Preliminary Screening of Alternatives" (HartCrowser, 1990a). The results of that screening are presented in Table 5-4 of that chapter. Table 4.2 of this report presents the alternatives retained for detailed analysis.

4.4 DETAILED DEVELOPMENT OF SELECTED ALTERNATIVES

4.4.1 EPA Comparison Criteria

The EPA report "Guidance on Preparing Superfund Decision Documents (EPA, 1989b) discusses the Superfund program's expections for Superfund remedial actions and lists nine criteria to be used to evaluate proposed remedial actions. The expections are summarized in Table 4.3 and the nine criteria listed in Table 4.4. The Feasibility Study used these criteria to develop and propose alternatives.

The criteria are divided into three groups: Threshold Criteria, Primary Balancing Criteria, and Modifying Criteria. The threshold criteria must be satisfied in order for an alternative to be eligible for selection. The primary balancing criteria are used to weigh major tradeoffs among alternatives.[12] Modifying criteria are taken into

[12]For evaluation of proposed remedial alternatives at the PACCAR site, waste minimization, reduction, or recycling is considered a balancing criterion.

account after comment on the draft cleanup action plan is received from the public and the EPA.

4.4.2 Comparative Analysis

PACCAR's detailed analyses of alternatives is presented in Chapter 6 of their Feasibility Study Report (HartCrowser, 1990a). Table 4.5, 4.6, and 4.7 present the results of their analyses. PACCAR did not include the waste minimization, reduction, and recycling criterion in their analyses, as this criterion was not promulgated until their feasibility study was substantially complete. The degree to which the proposed cleanup actions will satisfy this criterion as well as the other criteria will be addressed in Chapter 5, where the proposed alternatives are discussed in detail.

With respect to cleanup alternatives for contaminated soil (Table 4.5), neither the baseline condition with monitoring (No. 1) nor the baseline condition with monitoring and institutional controls (No. 2) meet the threshold criteria of overall protection of human health and the environment or compliance with RAO's and ARAR's. Hence neither of these, by itself, is an acceptable alternative. However, both monitoring and institutional controls are part of the proposed cleanup action.

The remaining three soil cleanup alternatives all meet the threshold criteria. Placing a cover (No. 7) minimally meets the threshold criteria but does not reduce the toxicity, mobility, or volume of waste.

Slow treatment and stabilization (No. 4b/5) meets threshold criteria and has good long-term effectivenes and reduces the toxicity, mobility, or volume of waste. However, it is costly and requires that a very large earth-moving project be undertaken to excavate, treat, and replace a large volume of soil with low levels of contamination.

Alternative No. 9/10, Cover with Treatment and Stabilization of Hot Spots combines the better aspects of alternative Nos. 7 and 4b/5. Soils with high levels of contamination would be excavated, treated or stabilized as appropriate to the soil contaminant, then placed on-site. Soils with low levels of contamination would be covered. This has the advantage of significantly reducing the volume of highly-contaminated soils on-site while requiring much less

excavation of soils with low levels of contamination. It is consistent with the Superfund program's expection that appropriate remedies at large sites with low concentrations of contaminated materials are frequently a combination of treatment and containment (See Table 4.3). Alternative 9/10 is the proposed alternative for cleanup of soils at PACCAR's site, and is described in detail in Chapter 5. In addition, alternative No. 8, excavation and disposal of soils contaminated with PCB's and Dangerous Waste levels of lead will be performed, and monitoring with institutional controls (No. 2) will be required.

With respect to cleanup alternatives for ground water (Table 4.6), neither the baseline condition with monitoring (No. 1) nor the baseline condition with monitoring and institutional controls (No. 2) meet the threshold criteria. Hence, neither of these, by itself, is an acceptable alternative. Pump and treat (No. 3) meets the threshold criteria, but is likely to be of only marginal effectiveness in the short term, would be difficult to implement, and is costly. The essential issue is that, with the exception of vinyl chloride, ground-water contamination is only slightly above MCL's set under the SDWA and is not contained in a well-defined plume. It is likely that a good deal of ground water could be pumped, treated, and disposed of at high cost with marginal effect. Moreover, not reflected in PACCAR's summary table (from which Table 4.6 was taken) is that ground-water contamination levels have declined as a result of remedial measures already undertaken by PACCAR, are continuing to decline, as evidenced by continuing monitoring to date, and are expected to decline further as "hot-spot" contamination in the soil is cleaned up. This is especially true for vinyl chloride, which has been detected beneath a portion of the site.

The proposed alternative for ground-water remediation at PACCAR is a combination of baseline conditions with monitoring (No. 1) and institutional controls (No. 2), with pump and treat (No. 3) or other positive treatment methods to be implemented if results of ground-water monitoring indicate such action is warranted. If ground-water quality standards discussed in Section 5.4 have not been attained within five years after completion of soil remediation, a pump and treat system or other positive treatment system will be installed unless Ecology approves a further waiting period to see if contamination levels continue to decrease. The decision of whether to install a pump and treat or other

positive treatment system or to allow a further monitoring period during which contamination levels are expected to decline below ground-water quality standards will be made by Ecology.

Monitoring will continue as long as contaminants are present above cleanup levels set in Section 3.6.2. If Ecology deems it appropriate, cleanup levels may be set for contaminants detected during the course of the monitoring program for which cleanup levels have not yet been set. Ecology may require modification of the monitoring program. Modifications of the monitoring program proposed by PACCAR shall require approval by Ecology.

With respect to cleanup alternatives for contaminated sediments, both alternatives in Table 4.7 meet the threshold criteria. Although both have essentially the same ratings in all categories but cost, for which alternative No. 5 is more expensive, alternative No. 5 has an advantage in long-term effectiveness in that PCB-contaminated sediments will not remain on-site. Alternative No. 5 is the proposed alternative for sediment remediation.

5. SELECTION OF CLEANUP ACTION

5.1 SELECTION OF CLEANUP ACTIONS

The requirements for selecting cleanup actions is described in WAC 173-340-360, "Selection of Cleanup Actions". The criteria for approving actions, the order of preference for cleanup technologies, policies for permanent solutions, the application of these criteria to particular situations, and the process for making these decisions are discussed.

There are four threshold requirements and three other requirements which comprise the criteria for approving actions. The four threshold requirements are that cleanup actions shall protect human health and the environment, shall comply with cleanup standards, shall comply with applicable state and federal laws, and shall provide for compliance monitoring. The three other requirements are that the cleanup use permanent solutions to the maximum extent practicable, provide for a reasonable restoration time frame, and consider public concerns raised during public comment on the draft cleanup action plan (this document).

Seven cleanup technologies may be used for cleanup of hazardous waste sites. They are, in order of descending preference for use:

(i) Reuse or recycling;
(ii) Destruction or detoxification;
(iii) Separation or volume reduction followed by reuse, recycling, destruction, or detoxification of the residual hazardous substance;
(iv) Immobilization of hazardous substances;
(v) On-site or off-site disposal at an engineered facility designed to minimize the future release of hazardous substances and in accordance with applicable state and federal laws;
(vi) Isolation or containment with attendant engineering controls; and
(vii) Institutional controls and monitoring.

The regulation indicates that preference shall be given to permanent solutions to the maximum extent practicable and that the cleanup be accomplished within a reasonable restoration time frame.

5.2 OVERVIEW OF THE SELECTED CLEANUP ACTION

The overall clean up strategy proposed is to combine institutional controls with treatment and containment (i.e., covering) of contamination to provide for long-term protection of human health and the environment and to ensure that all ARAR's are met. This is consistent with EPA's expections that appropriate Superfund remedial actions are frequently a combination of treatment of principal threats posed by a site and containment of low concentrations of materials and immobile wastes dispersed over large areas, with institutional controls acting as supplements to long-term engineering controls.

It is also consistent with Ecology's recognition (WAC 173-340-360(9)(c) of, " ... the need to use engineering controls, such as containment, for sites or portions of sites that contain large volumes of materials with relatively low levels of hazardous substances where treatment is impracticable". Protection of human health and the environment is assured by implementing a long-term monitoring program and institutional controls which remain in effect , " ... until residual hazardous substance concentrations no longer exceed site cleanup levels established under WAC 173-340-700 through 173-340-760" (WAC 173-340-360(8)(b).

This is the case at the PACCAR site, where industrial operations have been performed since 1907. These operations have resulted in low levels of contamination extending over a large area, with localized "hot-spot" areas of more concentrated contamination.

A key assumption underlying the cleanup strategy is that Renton will remain an urban area for the foreseeable future and that the PACCAR site will remain in industrial or commercial use. It is planned to use institutional controls in the form of deed restrictions to ensure that the site remains in industrial or commercial use, and that responsibility for environmental cleanup and monitoring remains clearly defined.

The selected cleanup action to be taken at PACCAR's Defense Systems Site utilizes all but (i) and (iii) of the seven technologies listed above. The following remediation tasks comprise the overall cleanup action to be taken at the site:

-- Soils with TPH concentrations above certain levels, the "hot-spot action levels" will be detoxified by biotreatment to protect ground-water quality,

-- Soils with metal and CPAH concentrations above certain levels, the "hot-spot action level" will be immobilized to prevent direct contact and to protect ground-water quality,

-- PCB-contaminated soils and sediments will be disposed of off-site at a permitted facility,

-- Soils with CPAH, TPH, or metal concentrations below the hot-spot action level but above the cleanup level set in Section 3.6 will be contained using a structural fill cover to prevent direct contact, and

-- Institutional controls and monitoring will be implemented to ensure that the integrity of the cover is maintained and that ground-water quality is protected.

Additional points regarding the overall cleanup action are as follows:

-- Air monitoring during cleanup activties will ensure that transport of contaminants in air-borne dust does not occur during the remediation.

-- Site access restrictions will prevent public contact with soil with low-levels of contamination and health and safety protocols will protect workers installing or repairing underground utilities.

-- Ground-water remediation is expected to be accomplished by removal and treatment of the soil hot spots, which will remove the most concentrated sources of contamination which could enter the ground water. If contamination levels in ground water are not reduced below acceptable levels within five years, Ecology may, if appropriate, require PACCAR to install a pump and treat or other positive ground-water treatment system. Ground-water monitoring will be performed to ensure that ground-water quality at the point of compliance

reaches and remains within regulatory limits. As indicated above, ground-water monitoring will continue for as long as contamination above cleanup levels specified in Section 3.6 remains on-site; cleanup levels may be set for additional contaminants, if detected; Ecology may require modification of the monitoring program; and modifications proposed by PACCAR will require Ecology approval.

-- Surface water monitoring will be performed to ensure that the quality of surface water at the point of compliance within regulatory limits. This will be part of the overall monitoring program and will also continue for as long as contamination above cleanup levels specified in Section 3.6 remains on-site.

5.3 SOIL CLEANUP

5.3.1 General Description

Soil will be remediated using Alternatives 8 and 9/10 of PACCAR's Feasibility Study (HartCrowser, 1990a). This involves treating soil hot-spot areas of lead, chromium, arsenic, CPAH, and TPH contamination, excavating PCB-contaminated soils above hot-spot action levels for off-site disposal at a permitted facility, and covering the remaining on-site soils which exceed cleanup levels set in Section 3.6.4, "Soil Cleanup Levels".

Figure 5.1 shows the approximate extent of soil to be excavated and disposed of under Alternative 8 and treated under Alternative 9/10. The sediment to be excavated under Sediment Alternative 5 is also shown. Figure 5.2 shows the extent of the protective cover to be placed after excavation and treatment are complete. These figures may be compared with Figure 3.12, which shows the approximate extent of soil contamination above MTCA cleanup levels.

Figures 3.12 and 5.1 may also be compared with FS Figures 6-3 and 6-8, respectively (HartCrowser, 1990a). The FS figures show the extent of soil contamination above RAO's developed prior to promulgation of the MTCA cleanup standards and the approximate extent of soil to be excavated as proposed in the FS. As expected, the approximate extent of soil contamination above MTCA standards (Figure 3.12,

this document) is greater than the approximate extent of soil contamination above RAO's (Figure 6-3 of the FS). This is because the MTCA-derived cleanup levels are lower than the RAO's.

Comparison of Figure 5.1 (this document) with FS Figure 6-8 indicates that soil volumes to be excavated and treated under this CAP are less than those proposed in the FS. This may also be seen by comparing Table 5.1 (this document, discussed below) with FS Tables 4-2 and 4-2. This lessening of treated volumes, even though all Hot-Spot Action Levels (HSAL's) remained the same or were lowered when going from RAO values to values set under WAC 173-340, reflects the results of additional analysis and sampling performed by PACCAR. In any case, it is the soil contaminant concentration which will control the amount of soil excavated. Soil areas and volumes to be excavated as shown on Figure 5.1 and indicated in Table 5.1 are minimums. If performance monitoring indicates hazardous substances exist in concentrations above HSAL's at the proposed limits of an excavation, excavation will be continue beyond those limits until soil with hazardous substance concentrations below the HSAL's is reached.

5.3.2 Excavation and Treatment of Arsenic, Lead, CPAH, and TPH Contaminated Soils

Figure 5.1 shows areas of soil containing high concentrations of arsenic, chromium, lead, CPAH's, and TPH, to be treated. Volumes associated with this treatment are indicated in Table 5.1. Table 5.1 also presents the MTCA cleanup levels in the second column and the hot-spot action levels in the fourth column. Soil volumes containing concentrations between the cleanup level and the HSAL will remain on-site, contained by structural fill.

These concertrations, which exceed the HSAL for the individual chemical of concern, will be excavated and treated. Soil with concentrations of chemicals of concern (hazardous substances) between the cleanup level and the HSAL will be contained by a structural fill cover. The HSAL was selected based upon needed reduction in site risks and practicability. WAC 173-340-360(8)(a) provides that containment may be used if it is not practicable to reuse, destroy, or detoxify the substances.

5.3.2.1 Setting of Hot-Spot Action Levels. WAC 173-340-360(5)(d)(vi) states that, "A cleanup action shall not be considered practicable if the incremental cost of the cleanup action is substantial and disproportionate to the incremental degree of protection it would achieve over a lowere preference cleanup action".

The chemical concentrations requiring treatment were chosen on the basis of practicable treatments that result in reduction of site risks and hazards as discussed below. The discussion will compare chemical concentrations to soil volume. The soil volume to be treated is directly proportional to the cost of treatment.

Arsenic. Figure 5.3 presents arsenic concentration vs. soil volume for the PACCAR site. On a site-wide basis, the average concentration of arsenic is estimated to be about 15 mg/kg (estimated by averaging available soil data). By treating soil with arsenic concentrations greater than 100 mg/kg, the site-wide average declines to about 10 mg/kg, a reduction of about 30 percent. A similar analysis assuming treatment of soil above 30 mg/kg yields a site-wide average of about 3 mg/kg, a reduction of 50 percent. Treating the soil above 100 mg/kg results in treating an estimated 2,400 cubic yards of soil, while treating the soil above 30 mg/kg results in treating an estimated 36,000 cubic yards of soil. To reduce the site-wide average (and relative risk) an additional 20 per cent, soil volumes would increase by about 1,500 per cent. Thus the additional reduction in relative risk is not practical or cost effective.

Chromium. Figure 5.4 presents chromium concentration vs. soil volume for the PACCAR site. On a site-wide basis, the average concentration of chromium is estimated to be about 65 mg/kg. By treating soil with chromium concentrations greater than 600 mg/kg, the site-wide average declines to about 50 mg/kg, a reduction of about 25 per cent. A similar analysis assuming treatment of soil above 100 mg/kg yields a site-wide average of about 35 mg/kg, a reduction of 45 percent. Treating the soil above 600 mg/kg results in treating an estimated 1,600 cubic yards of soil. To reduce the site-wide average (and relative risk) an additional 20 per cent, soil volumes would increase by about 2,000 per cent. Thus, the additional reduction in relative risk would not be practical or cost effective.

Lead. Figure 5.5 presents lead concentration vs. soil volume for the PACCAR site. On a site-wide basis, the average concentration of lead is estimated to be about 430 mg/kg. By treating soil with a lead concentration greater than 3,000 mg/kg, the site-wide average declines to about 230 mg/kg, a reduction of about 50 per cent. A similar analysis assuming soil above 1,000 mg/kg is treated yields a site-wide average of about 140 mg/kg or about a 70 per cent reduction in the site-wide average concentration. Treating soil above 3,000 mg/kg results in treating an estimated 1,600 cubic yards of soil. To reduce the site-wide average (and relative risk) an additional 20 per cent, soil volumes would increase about 2,000 per cent. This is not practical or cost effective.

CPAH's. Figure 5.6 presents CPAH concentration vs. soil volume for the PACCAR site. On a site-wide basis, the average concentration of CPAH's is estimated to be about 10 mg/kg. By treating soil with CPAH concentrations greater than 100 mg/kg, the site-wide average declines to about 5 mg/kg, a reduction of 50 per cent. A similar analysis assuming treatment of soil above 30 mg/kg yields a site-wide average of about 3 mg/kg, a reduction of 70 per cent. Treating the soil above 100 mg/kg results in treating an estimated 470 cubic yards of soil, while treating the soil above 30 mg/kg results in treating an estimated 9,500 cubic yards of soil. To reduce the site-wide average (and relative risk) an additional 20 per cent, soil volumes would increase by about 2,000 per cent. Thus, an additional reduction in relative risk is not practical or cost effective.

TPH. Figure 5.7 presents TPH concentration vs. soil volume for the PACCAR site. Hot-spot soils containing greater than 2500 ppm TPH will be bioremediated. On a site-wide basis, the average concentration of TPH is estimated to be about 660 mg/kg. By treating soil with TPH concentrations greater than 2500 mg/kg, the site-wide average declines to about 320 mg/kg, a reduction of about 50 per cent. A similar analysis assuming treatment of soil above 1,000 mg/kg yields a site-wide average of about 150 mg/kg, a reduction of 75 per cent. Treating the soil above 2,500 mg/kg results in treating an estimated 8,000 cubic yards of soil, while treating the soil above 1,000 mg/kg results in treating an estimated 30,000 cubic yards of soil. To reduce the site-wide average (and relative risk) an additional 20 per cent, soil volumes would increase by about 380 per cent. Thus, the additional

reduction in relative risk is not practicable or cost effective.

5.3.2.2 Treatment Methods. This section describes conceptual requirements and minimum reductions in contaminant concentrations for treatment methods. Specific requirements will be contained in the Engineering Design Report. In all cases, treatment shall involve well-designed and well-operated systems. The EPA has established, " ... as a guideline, that treatment as a part of CERCLA remedies should generally achieve reductions of 90 to 99 percent in the concentration or mobility of individual contaminants, although there will be situations where reductions outside the 90 to 99 percent range that achieve health-based or other site specific remediation goals (corresponding to greater or lesser concentration reductions) will be appropriate" (40 CFR Part 300, 1990, p. 8271). The Engineering Design Report will set quantitative levels of reduction, based upon pilot testing, which are consistent with this guideline. Treatment must be continued as long as effective reductions in concentration or mobility of individual contaminants are occurring.

It is planned to construct TPH treatment systems on-site. Soil will be excavated and placed in the systems. The treatment systems will be lined, bermed, and covered to control runoff and blowing dust. The soil will be aerated to further enhance the biological activity. Soil testing will be conducted in accordance with the Engineering Design and Compliance Monitoring Reports.

Soils containing metals and CPAH's above the hot-spot action levels will be treated by stabilizing them with Portland cement and other materials. Cement will be added to the soil to create a soil-cement mixture. Soil will be excavated, screened, crushed as necessary, mixed with the cement, and placed in layers on-site above the seasonally high water table. At least 12 inches of protective soil cover will be placed over the stabiized soil. Monitoring wells will be placed around the placement area.

The Engineering Design Report will contain detailed process design plans. Reports of laboratory and bench-scale tests on the soil-cement mixture which attest to the ability of the cement to immobilize the metals and CPAH's and prevent them from entering the ground water will be included as part of the Engineering Design Report. Testing of the soil-

cement mixture to assure it will perform as designed will be done in accordance with the Compliance Monitoring Report.

At a minimum, all areas indicated on Figure 5.1 will be excavated and treated. A sampling plan will be presented in the Compliance Monitoring Report which will ensure that all soils with TPH, metal or CPAH concentration levels above the hot-spot action levels are excavated and remediated. This may require excavation over larger areas than shown on Figure 5.1.

The sampling procedure during excavation will involve composite sampling of all or a portion of a side wall or the excavation bottom. The excavation will be enlarged over the minimum dimensions where composite sample analytical results indicate constituent levels greater than treatment levels, except where extending the vertical dimension would penetrate the underlying protective silt layer. This silt layer, which retards vertical infiltration of ground water, underlies fill materials across much of the site and is about five to ten feet thick. Care will be taken to avoid penetrating this silt layer.

Soil in "source areas" will also be excavated and treated. There are three such areas.

Two of the areas, LW-3 and the R&D building are former underground storage tank (UST) areas where contaminated backfill soils containing petroleum fuel residues and solvents were present. About 600 cubic yards of soil from the LW-3 area and 100 yards of soil from the R&D building area were excavated and placed in a lined treatment area in the Fall of 1990. The soils are being periodically tilled in a landfarm manner or treated using an aerated heap method. and Nutrients are being added to facilitate breakdown of fuel and solvent constituents.

A soil testing program will be conducted to assess how the concentrations of contaminants are decreasing due to the soil treatment. Depending on the results of the testing, the treated soil will either remain on-site or be shipped to a permitted disposal facility. This decision will require the approval of Ecology.

The third source area is soil containing arsenic which may be affecting ground-water quality in the vicinity of well LW-12. This soil (about 5 cubic yards) was excavated and

placed on-site in a covered stockpile in the Fall of 1990. This soil will be stabilized during full-scale operations as discussed above.

Remediation of TPH-contaminated soils by bioremediation will continue until contaminant concentrations are below the hot-spot action level of 2,500 ppm, measured by EPA Method 8015-Extended. The primary goal of the remediation of hydrocarbons is to reduce the concentrations of the more mobile constituents which will reduce the potential for migration into ground water. To achieve this goal, soils with total petroleum hydrocarbon concentrations greater than 2,500 mg/kg, measured using EPA Method 8015-Extended, will be treated. Process design studies are underway to optimize the treatment process to not only reduce the concentrations of the more mobile hydrocarbon constituents but also to reduce the concentrations of the heavier hydrocarbon constituents. Treated soils will be placed back on the site in a manner consistent with the hydrocarbon residuals remaining after treatment. Specifically, soils with TPH residuals below the gasoline cleanup level of 100 mg/kg, and the diesel and other TPH level of 200 mg/kg may be placed anywhere on-site. Soils with hydrocarbon residuals between the cleanup levels for TPH (gasoline, diesel, and other) and the 2,500 mg/kg hot-spot action level must be placed beneath a structural fill cover constructed to the same specifications as those used for the cover over the in-place soils with TPH concentrations between the cleanup level and the hot-spot action level. Measurement will be by Method 8015-extended, with identification of peaks on the chromatogram to estimate gasoline, diesel, and other TPH levels.

Determination of contaminant concentration will be by chemical analyses made on samples taken from the processed material. A Quality Assurance/Quality Control plan for performance monitoring in accordance with WAC 173-340-410 will be presented in the Engineering Design Report.

Samples of metal and CPAH contaminated soils will be taken from soil-cement layers and tested to ascertain that the soil-cement mixture was blended and placed in accordance with specifications contained in the Engineering Design Report.

A Quality Assurance/Quality Control plan for performance monitoring in accordance with WAC 173-340-410 will be presented in the Compliance Monitoring Report.

A system of buried diesel lines exists on the site which was used to distribute diesel fuel from a central area to plant facilities. These pipes will be removed as encountered during site excavations. Remaining diesel fuel will be collected, the pipes cleaned, and the product and pipes disposed of off-site in an appropriate manner. A plan will be included in the Engineering Design Report regarding handling and proper disposal of the fuel and piping. Soil excavated during the pipe removal containing diesel fuel residues will be treated as part of the hot-spot TPH-contaminated soils.

All treated soil with residual hazardous substance concentrations above cleanup levels set in Section 3.6 will remain on-site and will be covered with the structural fill cover discussed in Section 5.3.2.2.

5.3.3 Excavation and Disposal of PCB Contaminated Soil

Soil testing indicates that PCB's above the soil cleanup level of 1 ppm are present in a few areas within the northwest portion of the site (See Figure 5.1).

Figure 5.8 presents PCB concentration vs. soil volume. On a site-wide basis, the average concentration of PCB's in soil is 0.79 mg/kg. By treating soil with PCB concentrations greater than 7 mg/kg (abour 267 cubic yards of soil), the site-wide average declines to 0.22 mg/kg, a reduction of 72 per cent. Treating soil above 1 or 4 mg/kg results in treating an estimated 4,535 or 2,801 cubic yards of soil, respectively. This would reduce the site-wide average to 0.10 or 0.15 mg/kg, respectively. Thus, further reduction of the site wide average, and hence relative risk, an additional 9 or 15 percent would require an increase in soil volumes of approximately 1700 or 1000 percent, respectively, over the 267 yards of soil with PCB concentrations in excess of 7 mg/kg. This is not practicable or cost effective.

About 15 to 30 truck loads of soil will leave the site, depending on the size of trucks used, if 267 cubic yards of soil require disposal. If additional soil with PCB concentrations exceeding 7 mg/kg are found during the excavation, more truck loads of soil will leave the site. The Engineering Design Report will include a plan approved by Ecology and the City of Renton to prevent the off-site migration of soil by trucks or by dust. Truck washing and dust control techniques will be used as necessary to ensure

that any off-site migration of soil and dust is controlled. Truck traffic will be restricted to the I-405/Park Drive interchange, to and from the site, on Garden Avenue, Park Avenue, and North 8th Street. Hours of trucking operations will be subject to approval by the City of Renton.

Soil containing PCB concentrations between the cleanup level, 1 mg/kg, and the HSAL, 7 mg/kg, will be covered with a minimum thickness of one foot of structural fill.

5.3.4 Structural Fill Cover

After soil and sediment (See Section 5.5) treatment activities have been completed, a protective cover will be installed over all treated and nontreated soils and sediment with metal, CPAH, PCB, or TPH contamination levels above cleanup levels as defined in Section 3.6.

The protective cover will consist of a layer of compacted imported structural fill material with a minimum thickness of 12 inches. Existing pavement covers about 50 per cent of the site; this existing pavement will serve as temporary protective cover. As pavement is removed during remediation or future site development, it will be replaced with structural fill cover as a minimum. Future development may include buildings or pavement which act as additional cover material.

The purpose of the cover is to minimize the possibility of uncontrolled contact with contaminated soil, the creation of contaminated dust, and the erosion and off-site migration of contaminated soil via surface water flow.

As discussed below, the site has had minimal impact on the ground water to date, and remediation of the hot-spot areas is anticipated to further reduce the potential for transport of contaminants to the ground water. Hence, a low-permeability clay cover or impermeable geomembrane cover is not considered necessary. Both would complicate redevelopment of the site. It is anticipated that the best cover will ultimately be provided by buildings and asphalt and concrete parking lots constructed on-site with surface runoff routed to surface drainage ditches and thence off-site.

A specific cover plan will be developed and included in the Engineering Design Report. Since specific future development activities are unknown, the cover plan will assume that the installed cover must provide permanent protection.

5.3.5 Stormwater System Improvements

Stormwater system improvements are proposed to facilitate remediation activities. These improvements are shown on Figure 5.9 and consist of relocating an existing north-south storm drain to along Houser Way and constructing a new east-west stormwater intercept at about the midpoint of the site. These systems will assist remediation by more efficient collection of stormwater that may be in the area of excavations and will remove the difficulty of excavating in the vicinity of the existing storm drain. The east-west intercept is primarily proposed to allow remediation over several construction seasons, e.g., if the north portion of the site is remediated first. If the remediation is conducted over one season only, the east-west intercept may not be necessary.

5.3.6 Quality Assurance/Quality Control

All soil remediation work performed will be under a Quality Assurance/Quality Control plan approved by Ecology and made part of the Engineering Design Report. This plan will be in accordance with relevant sections of Chapter 173-340 WAC.

5.3.7 Monitoring

WAC 173-340-360(8)(b) states:

> "Long-term monitoring (WAC 173-340-410) and institutional controls (WAC 173-340-440) shall be required if on-site disposal, isolation, or containment is the selected cleanup action for a site or portion of a site. Such measures shall be required until residual hazardous substance concentrations no longer exceed site cleanup levels established under WAC 173-340-700 through WAC 173-340-760."

Since containment is the selected action for soil contamination below the HSAL's, a confirmational monitoring program which ensures the protection of ground water and surface water from contamination from arsenic, chromium, lead, CPAH,

PCB's, and TPH shall be implemented as part of the cleanup action. The program will provide for detecting concentrations of these hazardous substances above practical quantitation limits, specify action levels which will require implementation of remedial measures, provide a contingency plan regarding what the measures are to be, and specify a schedule for the implementation of the contingency plan. The number and location of sampling points shall be subject to approval by Ecology.

5.3.8 Air Monitoring During Remedial Activities

A plan will be prepared for monitoring air quality during remediation operations, to ensure that operations do not generate contamination from air-borne dust.

5.3.9 Maintenance and Health and Safety Considerations

The Engineering Design Report will contain a cover maintenance plan and a Health and Safety Plan for workers who will be installing underground utilities and foundations. The cover maintenance plan will consider activities on-site which might breach the cover or otherwise cause its failure to perform. The Health and Safety Plan will provide for checking of contamination levels prior to worker entry into soil beneath the cover, for proper protection of workers entering trenches from both chemical and physical hazards, for disposal of contaminated material encountered during excavation, and for prevention of contaminant migration into drinking water, storm water, and sanitary sewer pipes.

5.4 GROUND-WATER CLEANUP

Ground-water remediation will utilize components of all three alternatives considered: monitoring, institutional control, and, potentially, pump and treat or other positive ground-water treatment methods (See Table 4.2).

An important component of ground-water remediation is the soil remediation. This is expected to further reduce the potential for ground-water contamination by removing potential sources of contamination. Arsenic, lead, benzene, and vinyl chloride are the ground-water contaminants of concern. With the exception of lead, concentrations of these chemicals exceed cleanup levels and Maximum Concentration Limits (MCL's) set by the Safe Drinking Water

Act (SDWA) in selected monitoring wells. The MCL's are 0.05 mg/L for arsenic, 0.05 mg/L for lead, 0.005 mg/L for benzene, and 0.002 mg/L for vinyl chloride. Note that the MCL's for arsenic, lead, and vinyl chloride are an order of magnitude greater than the cleanup levels set for these chemicals in Section 3.6.2. MCL's set by the SDWA are considered hot-spot action levels for ground water.

There is no readily discernible pattern to the arsenic, lead, or benzene contamination, which makes design of an efficient pump and treat system complex. Excavation and treatment of soil containing the highest metals concentrations is expected to bring all metals concentrations below SDWA MCL's.

Vinyl chloride exceeds the MCL set by the Safe Drinking Water Act, and displays a discernible concentration pattern. The available data indicate that wells LW-6D and LW-9D have the highest concentrations of vinyl chloride. However, these concentrations have declined on the order of 70 to 90 per cent since 1986, and hence are expected to decline further. Projections using available data indicate that vinyl chloride concentrations are anticipated to meet the MCL of 0.002 ppm within three to five years. Soil quality data indicate there is no current source on-site of either vinyl chloride or parent chemicals from which it could derive.

Remediation of hazardous substances in ground water to concentrations within MCL's set by the Safe Drinking Water Act is anticipated to be primarily accomplished by soil remediation. Ground water will be monitored for five years following remediation. If, after that time, contaminant concentrations are not below MCL's, a pump and treat, or other positive treatment system may be required by Ecology for removal of ground-water contamination. The design will require Ecology approval.

If data collected during the initial five year monitoring period warrant, Ecology may allow a further period of time to allow contamination levels to come below MCL's. The decision of whether to wait longer or install a treatment system, and the exact nature of any treatment system required, will be based upon data collected during the initial five year monitoring period. The Engineering Design Report will include a detailed ground-water monitoring plan which specifically indicates conditions which will require

installation of a pump and treat or other positive treatment system. Any change in the monitoring plan will require the approval of Ecology.

Ground-water monitoring will be done on a semi-annual and annual basis initially. As monitoring proceeds and trends in ground-water data are further refined, PACCAR may make application to Ecology regarding revision of the ground-water monitoring plan. As specified in WAC 173-340-360(8)(b), monitoring will continue until residual hazardous substance concentrations in all media on-site no longer exceed site cleanup levels established in Section 3.6.2 of this document.

As noted in Section 5.2, institutional controls will be placed on ground-water use at the site such that no drinking water wells are installed in areas in which chemical concentrations in ground water exceed MCL's set by the Safe Drinking Water Act. Should wells be installed to provide process water, a National Pollutant Discharge Elimination System (NPDES) permit or State Waste Discharge permit will be required for discharge of the process water.

5.5 SURFACE WATER CLEANUP

The structural fill component of the preferred remedial alternative will prevent erosion and particulate migration of industrial fill soils by placement of clean fill over contaminated soils. In addition, excavation and stabilization of the most highly lead, chromium, and arsenic contaminated soils and sediment remediation will both prevent contact of these soils with surface water and decrease the amount of contaminated soils available for erosion. In addition, a new drainage system (see Figure 5.9) will be installed which will minimize the potential for exceedence by directing surface water through pipes or ditches underlain by clean fill.

A surface-water monitoring program shall be included in the Engineering Design Report. The water quality of the surface water leaving the site will be clearly defined, and a monitoring program implemented to evaluate whether or not the water quality objectives are being obtained. Action levels requiring implementation of remedial measures will be defined that are consistent with local storm water discharge standards. As specified in WAC 173-340-360(8)(b), monitoring will continue until residual hazardous substance

concentrations in all media on-site no longer exceed site cleanup levels established in Section 3.6 of this document. Cleanup levels may be set for additional contaminants, if detected; Ecology may require modification of the monitoring program; and modifications proposed by PACCAR will require Ecology approval.

5.6 SEDIMENT CLEANUP

Testing indicates that sediment in the bottom of the main drainage ditch from the site (grid location A4 to D4, Figure 5.1) contains PCB concentrations of about 1 to 3 ppm. This exceeds the sediment HSAL of 1 ppm. Sediment from the ditch which exceeds 1 ppm PCB concentration will be excavated and disposed of in a permitted landfill.

Metals in the sediments will also be addressed. Metals in sediments do not exceed metal HSAL's for soil. As the property is developed, the open ditch will be lined with a geotextile fabric barrier and a minimum of one foot of structural fill. The purpose of the geotextile is to prevent migration of any remaining low concentrations of PCB's in soil into the structural fill and to signal maintenance workers the boundary between structural fill and remaining soil, which may contain PCB concentrations between 0 and 1 ppm and metal concentrations between cleanup levels and HSAL's. Drainage will may be routed through a drainage pipe at this or another location.

The Engineering Design Report will contain plans for testing contaminant concentrations during excavation and ensuring that all sediment with PCB concentrations of over 1 ppm are excavated. Up to 700 cubic yards of sediment may be removed. The Engineering Design Report will contain plans for off-site sediment migration and dust control similar to those for soil, as described in Section 5.3.1. Truck routing and hours of operation will also be specified in the Engineering Development plan and will be the same as for the soil.

5.7 INSTITUTIONAL CONTROLS

Covenants will be placed in the property deed to ensure that operation and maintenance of all cleanup measures and monitoring of environmental media continues. The covenants will be specified in a consent decree governing site cleanup entered into between Ecology and PACCAR. The monitoring

program will be specified in a Compliance Monitoring Plan governing the site. This Plan, which requires Ecology approval, is further discussed in Chapter 6.

5.8 EVALUATION OF THE CLEANUP ACTION WITH RESPECT TO FEDERAL AND STATE REQUIREMENTS

The remedial measures described above form a comprehensive scheme to remediate the site with full consideration of the federal remediation criteria discussed in Section 4.3.1 and Table 4.4 and MTCA criteria discussed in Section 5.1.

The selected remedy is protective of human health and the environment and complies with federal and state requirements that are applicable or relevant and appropriate. All contaminants above cleanup levels, which were set in accordance with WAC 173-340-700 through 760, will either be contained or their toxicity, mobility, or volume reduced. Chemical-specific and action-specific ARAR's for the site identified by PACCAR are discussed in Appendix A. No location-specific ARAR's were identified. Sections 3.3 and 3.4 and Appendix D of the Feasibility Study (HartCrowser, 1990a) provide a detailed discussion of identification of ARAR's by PACCAR.

With respect to long-term effectiveness and permanence, the proposed remedy uses a combination of institutional controls, off-site disposal, treatment, containment, and site monitoring, to achieve cleanup. Specifically, the most highly contaminated soils on-site, will be either excavated and disposed of at a permitted facility or treated to reduce the toxicity, mobility, or volume of contaminants. Treated soils will be placed on-site. The remaining soils, which will contain low levels of contamination, will be covered to prevent contaminated dust from becoming air-borne. Institutional controls will restrict site access, provide for long-term monitoring, and implement a health and safety plan for underground excavation at the site. Site redevelopment will occur only under a plan approved by Ecology.

With respect to short-term effectiveness and implementability, the proposed remedy limits the amount of remedial construction, and hence environmental impacts during remediation. The remedy is technically implementable and cost effective.

In selecting the remedy the two main balancing factors which had to be considered were how much soil to treat and whether or not to require pumping and treatment (or other positive treatment) of ground water.

The decision to treat the most highly contaminated soil is believed to be the best balance between short-term effectiveness and cost. With regard to short-term effectiveness, if all soils with contamination were to be treated a much greater degree of construction activity would occur on-site. This would result in greater potential for dust generation, and have a greater overall impact on the community from a larger construction operation. Treatment of the soils with low levels of contamination would result in a large-scale, possibly noisy, earth-moving operation on the site. If more than 25,000 cubic yards of soil were to be excavated, it might be necessary to haul that portion in excess of 25,000 cubic yards through the City of Renton to off-site locations as there may be insufficient capacity on-site to treat the excess. Although the current proposed volume is 11,840 cubic yards, actual treatment volumes will be governed by HSAL limits and may be greater. Thus, the site can accommodate about twice as much as the minimum volume of soil proposed for treatment. The ability to accommodate additional soil which may need treatment beyond the minimum volumes proposed is considered a "safety factor" to ensure that work can proceed smoothly if hazardous substance concentrations above HSAL's prove to be more widely distributed than indicated by sampling data.

Moreover, although quantitative analyses have not been made, it is possible that the chance of workers or members of the community being injured[13] during the large earth-moving operation may be greater than the hazards posed by the low level of contamination in most of the soil.

If all soils above the cleanup levels were to be treated (about 500,000 cubic yards), the treatment would involve off-site disposal. Off-site disposal would require about 28,000 truck trips over a one- to two-year period. This amount of truck traffic on local streets over that period of time may have a greater overall impact on the community than hot-spot soil treatment.

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[13]Say, from traffic accidents involving ingress and egress to the site.

In terms of cost, treatment of all soils would greatly increase the cost of the cleanup, increasing costs by about $40 million or more. The increase in cost is not simply an additional cost to be borne by PACCAR; it represents a use of resources such as labor, equipment, and energy, which may result in only a marginal increase, if any, in long-term improvement of the environment and decrease in risk to human health.

If long-term monitoring indicates additional measures are necessary to prevent contamination of ground water, surface water, or air from hazardous substances remaining in soil on-site, the measures may be designed with a much greater knowledge, of the specific nature and extent of additional cleanup required.

These same considerations apply to installing a pump and treat, or other positive treatment, system for ground water remediation. Such a system would require setting up facilities to treat the ground water, with potential discharge of organic contaminants to the air and disposal of metallic contaminants to permitted facilities. Activated charcoal filters (or other systems) would be installed to reduce organic contaminant discharge into the air. However, the spent activated charcoal (or residues from other systems) must still be treated or disposed of somewhere. Finally, the additional cost must be thought of in terms of material and energy resources used to manufacture and install equipment and energy resources used to pump the ground water from the ground to the treatment equipment.

Of course, if ground-water contamination levels are not below MCL's within five years from completion of soil remediation, and no clear trend indicates that levels will be below MCL's within a reasonable period, a positive treatment system will be installed.

The remedy minimizes waste transported off-site and reduces, by bioremediation, the amount of TPH-contaminated soil on-site. Contaminated media at PACCAR's site are not amenable to reuse and recycling because they are present at concentrations too low to permit efficient reclamation.

5.9 CHANGED CONDITIONS

If, during the course of the remediation, conditions are found by either PACCAR or Ecology to be significantly

different from those anticipated based upon the RI/FS, either PACCAR or Ecology may initiate a change-order based upon actual field conditions. Implementation of such a change-order will require the approval of Ecology.

Note that soil and sediment excavation requirements are based upon chemical concentrations, not volumes presented in the Feasibility Study. The need to excavate additional soil volumes to ensure that all soil with hazardous substance concentrations above HSAL's are excavated and treated will not be considered a changed condition.

5.10 SEPA

Appendix B presents State Environmental Policy Act (SEPA) documents for the cleanup actions proposed for the PACCAR site.

5.11 PERMITTING

PACCAR is responsible for obtaining all necessary permits to implement this CAP.

5.12 ERRORS

Any errors of fact or calculation contained in this Cleanup Action Plan are subject to correction.

5.13 PUBLIC COMMENT

The draft CAP was submitted for public comment during the period June 17 to July 16, 1991. Questions raised and Ecology's responses are presented in Appendix C. A transcript of formal comments received during a public hearing regarding the site and copies of written comments received during the comment period follow the questions and responses.

The following requirements for implementing the CAP at the PACCAR site are added as to address public concerns raised during public comment (See Appendix C):

1. PACCAR is required to investigate the nature and extent of potential contamination in a ditch reported to have existed along the west boundary of the site. Plans, including a schedule for implementation, for this investigation must be

submitted to Ecology for approval by December 31, 1991. Resolution of any disagreement regarding the scope of the investigation or schedule for its implementation will be performed under Article XIII, "Resolution of Disputes" of this Consent Decree. If this investigation finds contamination similar to contamination already confirmed to exist on site, it will be remediated following provisions of this CAP. If contaminants other than those considered in this CAP, or substantially different conditions are encountered, an amendment to this CAP will be prepared to govern the necessary remediation.

2. PACCAR will place screening on the existing south fence of the property between Building Number 1 and Houser Way North (vacated) to screen the cleanup actions from North Fourth Street and from the residential area to the south of the property.

3. No soil treatment will occur within 325 feet of the south property boundary. No soil treatment will occur above the Aquifer Protection Area.

6. COMPLIANCE MONITORING

Compliance monitoring will be performed in accordance with WAC 173-340-410. PACCAR will prepare Protection, Performance, and Confirmational Monitoring plans and submit them to Ecology for review and approval. These monitoring plans will be based on data collected as part of the remedial investigation, interim water-quality monitoring program, and other studies. The plans will describe how data is to be interpreted, the conditions in which additional remedial actions may be required, methods for data confirmation, and reporting of monitoring results to Ecology. All cleanup actions and long-term monitoring will be performed in accordance with these plans.

The confirmational monitoring plan will provide for monitoring ground water and surface water and will contain trigger levels for contaminants such that if monitoring detects the presence of a contaminant above a trigger level, Ecology will be notified and may require additional cleanup actions. The method for confirming the presence of a contaminant above the trigger level will be specified.

An inspection plan will be developed to ensure the structural fill cover maintains its integrity.[14]

WAC 173-340-360(8)(a) requires that,

> "Long-term monitoring (WAC 173-340-410) and institutional controls (WAC 173-340-440) shall be required if on-site disposal, isolation, or containment is the selected cleanup action for a site or a portion of a site. Such measures shall be required until residual hazardous substance concentrations no longer exceed site cleanup levels established under WAC 173-340-700 through 173-340-760".

[14]Air monitoring for soil contaminants is not feasible because the contaminants of interest (chromium, arsenic, and lead) are ubiquitous in the environment from other sources. In addition, with proper maintenance the structural fill cover is a very reliable means of preventing the creation of contaminated dust.

Since the proposed cleanup action involves on-site disposal of stabilized soil and containment of soil with chemical concentrations between cleanup levels and HSAL's, long-term monitoring and institutional controls will continue until such time as PACCAR demonstrates to Ecology that residual hazardous substance concentrations no longer exceed site cleanup levels established under WAC 173-340-700 through 173-340-760 as described in this document.

It is anticipated that changes may be made to the monitoring program as data is collected and analyzed. These changes may include increasing or reducing the sampling frequency, addition or deletion of monitoring parameters, addition or elimination of wells, and addition or elimination of surface water sampling points. Such changes will be based on analysis of data collected during the monitoring program. Wells or surface water sampling points may also be replaced due to their elimination because of site development or other causes which result in destruction or inaccessibility of wells in the program. Changes to the monitoring plan may be proposed by PACCAR or Ecology and will require Ecology approval.

It is anticipated that monitoring parameters will include volatile organic compounds, semivolatile organic compounds (i.e., CPAH's), total petroleum hydrocarbons (TPH), lead, chromium, arsenic, and PCB's. These are the major constituents which will remain on the site after remediation is complete. An exact schedule of sampling stations and the parameters to be analyzed for at each station will be included in the monitoring plan. Elimination of parameters from monitoring will be considered substantial and will require public participation in accordance with WAC 173-340-600(14)(a).

It is possible that changes may be required because of amendments to Chapter 173-340 WAC. If such changes are made, they may be considered substantial and may require public participation in accordance with WAC 173-340-600(14)(a). Ecology will decide whether public participation is required in the event of such changes, and will consider the extent of public involvement in the amendments to Chapter 173-340 WAC in making this decision.

7. SCHEDULE FOR IMPLEMENTATION

Within nine months of the date of signing of the Consent Decree by Ecology and PACCAR implementing this CAP, PACCAR is to provide an Engineering Design Report with relevant plans and specifications and a Compliance Monitoring Report. These reports may be developed and submitted in separate volumes or sections, as appropriate, to cover work to be performed in phases.

After signing of the Consent Decree, no work will be performed until Ecology has approved those portions of the Engineering Design Report and the Compliance Monitoring Report governing that work. Ecology may require modification of work completed prior to signing of the Consent Decree if such work is not in accordance with a subsequently approved section of either the Engineering Design Report or the Compliance Monitoring Plan.

Within two years of the date of signing of the Consent Decree, excavation of hot spots is to be completed and stabilized soils placed in cells. The structural fill cover is to be in place over all required areas not covered by existing concrete or asphalt. Sediment cleanup is to be complete and a drainage pipe placed in the ditch or drainage rerouted as described in Section 5.6. The operations and maintenance plan is to be completed.

Within four years of the date of signing of the Consent Decree, bioremediation of TPH-contaminated soils is to be completed and the treated soils placed in cells. Treated soils with residual hazardous substance concentrations below cleanup levels set in Section 3.6 may be hauled off-site.

Dates will be extended day-for-day for events outside of PACCAR's control, such as acts of God, severe weather conditions (including heavy rains), or strikes. Delays in obtaining permits from appropriate agencies which are attributable to the agency in question will also be considered an event outside of PACCAR's control, providing PACCAR has made timely application.

8. REFERENCES

8.1 REFERENCES CITED IN TEXT

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EPA, 1990, Guidance on Remedial Actions for Superfund Sites with PCB Contamination: OSWER Directive No. 9355.4-01, August, 1990. Office of Emergency and Remedial Response, U.S. Environmental Protection Agency, Washington, D.C. 20460.

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Harper-Owes, 1985, "Background Water and Soil Quality of the Pilchuck Tree Farm Demonstration Site, 1982 to 1984": Prepared for the Municipality of Metropolitan Seattle (METRO), Seattle, Washington.

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METRO, 1989, Unpublished Soils Data from Pilchuck Tree Farm, Pack Forrest, Edmonds Community College and King County Section 24.

METRO, 1982, Cedar River Resource Inventory: Technical Report WR-82-10, Water Quality Division, Municipality of Metropolitan Seattle, Washington. 60 pp.

8.2 ADDITIONAL REFERENCES

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HartCrowser, November 28, 1989, Written communication to Lynn Coleman, Washington Department of Ecology on Proposed Refinement of Remedial Action Objectives for Petroleum Hydrocarbons in Soil, PACCAR Renton Site.

HartCrowser, January 17, 1990, Written Communication to Lynn Coleman, Washington Department of Ecology on Additional Information on the Use of GC/FID for Petroleum Contamination at the PACCAR Renton Site.

HartCrowser, May 15, 1990, Written Communication to Robert K. Butler, PACCAR, Inc., on Surface Water and Groundwater Monitoring Results.

HartCrowser, September 18, 1990, Written Communication to David South, Washington Department of Ecology on Responses to Questions Provided by Ecology and EPA on the Feasibility Study and Cleanup Action Plan.

HartCrowser, December 13, 1990, Written Communication to Robert K. Butler, PACCAR, Inc., on Surface Water and Groundwater Monitoring Results.

HartCrowser, February 14, 1991, Written Communication to David South, Washington Department of Ecology on Responses

to Questions Provided by Ecology regarding the PACCAR Renton Site.

PACCAR, March 6, 1991, Written Communication to David South, Washington Department of Ecology, on Information for PACCAR Draft CAP.

PACCAR, March 20, 1991, Written Communication to David South, Washington Department of Ecology, on Information for PACCAR Draft CAP.

Table 3.1
Summary of Chemicals for Which Analyses Were Performed at the PACCAR Defense Systems Site

METALS AND INORGANICS:		VOLATILE ORGANIC COMPOUNDS:
•+ Aluminum	• Selenium	•+ Acetone
Antimony	•+ Silver	•+ Benzene
•+ Arsenic	•+ Sodium	Bromodichloromethane
•+ Barium	Thallium	Bromoform
• Beryllium	• Tin	Bromomethane
•+ Cadmium	• Titanium	• 2-Butanone
•+ Total Chromium	• Vanadium	• Carbon Disulfide
•+ Cobalt	•+ Zinc	Carbon Tetrachloride
•+ Copper	ORGANIC SCREEN PARAMETERS:	+ Chlorobenzene
• Cyanide	•+ Total ABN's (GC/FID)	+ Chloroethane
•+ Iron	• Total Pesticides (as Heptachlor)	Chloroform
•+ Lead	• Total Petroleum Hydrocarbons	Chloromethane
•+ Magnesium	•+ Total Phenol	Dibromochloromethane
•+ Manganese	• Total Photoionization (H-Ns)	+ 1,1-Dichloroethane
•+ Mercury	•+ Total Volatiles (as N-Dodecane)	+ 1,2-Dichloroethane
•+ Nickel	• Total Halogenated Hydrocarbons	+ 1,1-Dichloroethene
•+ Potassium		(Continued on next page ...)

Key:

Chemical not detected

• Chemical detected in soil or sediment at least once (HartCrowser, 1989, Table 7.1)

+ Chemical detected in water at least once (HartCrowser, 1989, Table 7.2)

Chemical of concern based on Preliminary Risk Assessment Screening, (HartCrowser, 1990, Table 3-1)

(Shaded) Chemical of concern based on detailed risk assessment (HartCrowser, 1990, Table 3-2)

ABN's = Acid/Base Neutral Compounds
GC/FID = Gas Chromatograph with Flame Ionization Detector
SEMIVOL = Semivolatile
CMPDS = Compounds

Table 3.1, Continued

VOLATILE ORGANIC CMPDS, Continued:	*+ Vinyl Chloride	Endrin Ketone
+ cis-1,2-Dichloroethene	*+ Total Xylenes	Heptachlor
*+ trans-1,2-Dichloroethene	*+ 1,1,1-Trichloroethane	Heptachlor Epoxide
+ 1,2-Dichloropropane	PESTICIDES AND PCB's:	Methoxychlor
cis-1,3-Dichloropropene	+ Aldrin	Polychlorinated Biphenyls:
trans-1,3-Dichloropropene	a-BHC	Aroclor 1016
*+ Ethylbenzene	b-BHC	Aroclor 1221
+ 2-Hexanone	d-BHC	Aroclor 1232
*+ Methylene Chloride	+ g-BHC	Aroclor 1242
4-Methyl-2-Pentanone	Chlordane	Aroclor 1248
Styrene	Dieldrin	* Aroclor 1254
1,1,2,2-Tetrachloroethane	4,4'-DDD	*+ Aroclor 1260
*+ Tetrachloroethene	* 4,4'-DDE	Toxaphene
*+ Toluene	*+ 4,4'-DDT	
*+ 1,1,1-Trichloroethane	Endosulfan	SEMIVOLATILE ORGANIC CMPDS:
*+ 1,1,2-Trichloroethane	+ Endosulfan II	*+ Acenaphthene
* Trichloroethene	Endosulfan Sulfate	*+ Acenaphthylene
*+ Vinyl Acetate	Endrin	Aniline

Key:

Chemical not detected

* Chemical detected in soil or sediment at least once (HartCrowser, 1989, Table 7.1)

+ Chemical detected in water at least once (HartCrowser, 1989, Table 7.2)

Chemical of concern based on Preliminary Risk Assessment Screening, (HartCrowser, 1990, Table 3-1)

(Shaded) Chemical of concern based on detailed risk assessment (HartCrowser, 1990, Table 3-2)

ABN's = Acid/Base Neutral Compounds
GC/FID = Gas Chromatograph with Flame Ionization Detector
SEMIVOL = Semivolatile
CMPDS = Compounds

Table 3.1, Continued

OTHER SEMIVOL CMPDS, Continued:		
• Anthracene	4-Chloro-3-methylphenol	2,4-Dinotrophenol
Benzidene	2-Chloronaphthalene	2,4-Dinitrotoluene
• Benzoic Acid	2-Chlorophenol	2,6-Dinitrotoluene
• Benzo(a)anthracene	4-Chlorophenyl phenylether	1,2-Diphenylhydrazine
• Benzo(a)pyrene	• Chrysene	• Fluoranthene
• Benzo(b)fluoranthene	•+ Dibenzofuran	•+ Fluorene
• Benzo(g,h,i)perylene	• Dibenzo(a,h)anthracene	• Hexachlorobenzene
• Benzo(k)fluoranthene	+ 1,2-Dichlorobenzene	Hexachlorobutadiene
Benzyl Alcohol	+ 1,3-Dichlorobenzene	Hexachlorocyclopentadiene
Bis(2-chloroethoxy)methane	+ 1,4-Dichlorobenzene	Hexachloroethane
Bis(2-chloroethyl)ether	• 3-3'-Dichlorobenzidine	• Indeno(1,2,3-cd)pyrene
Bis(2-chloroisopropyl)ether	2,4-Dichlorophenol	Isophorone
•+ Bis(2-ethylhexyl)phthalate	•+ Diethyl phthalate	•+ 2-Methylnaphthalene
4-Bromophenyl phenylether	•+ 2,4-Dimethylphenol	•+ 2-Methylphenol
• Butylbenzylphthalate	Dimethyl phthalate	•+ 4-Methylphenol
4-Chloroaniline	•+ Di-n-butyl phthalate	•+ Naphthalene
2-Chloroethylvinylether	•+ Di-n-octylphthalate	2-Nitroaniline
	4,6-Dinitro-2-methylphenol	(Continued on next page ...)

Key:

Chemical not detected

• Chemical detected in soil or sediment at least once (HartCrowser, 1989, Table 7.1)

+ Chemical detected in water at least once (HartCrowser, 1989, Table 7.2)

Chemical of concern based on Preliminary Risk Assessment Screening, (HartCrowser, 1990, Table 3-1)

(Shaded) Chemical of concern based on detailed risk assessment (HartCrowser, 1990, Table 3-2)

ABN's = Acid/Base Neutral Compounds
GC/PID = Gas Chromatograph with Flame Ionization Detector
SEMIVOL = Semivolatile
CMPDS = Compounds

Table 3.1, Continued

OTHER SEMIVOL CMPDS, Continued:		
3-Nitroaniline		
* 4-Nitroaniline		
Nitrobenzene		
2-Nitrophenol		
4-Nitrophenol		
N-Nitrosodiphenylamine		
N-Nitroso-di-n-propylamine		
*+ Pentachlorophenol		
*+ Phenanthrene		
*+ Phenol		
* Pyrene		
1,2,4-Trichlorobenzene		
2,4,5-Trichlorophenol		
2,4,6-Trichlorophenol		
OTHER PARAMETERS:		
pH		

Key:

Chemical not detected

* Chemical detected in soil or sediment at least once (HartCrowser, 1989, Table 7.1)

+ Chemical detected in water at least once (HartCrowser, 1989, Table 7.2)

Chemical of concern based on Preliminary Risk Assessment Screening, (HartCrowser, 1990, Table 3-1)

(Shaded) Chemical of concern based on detailed risk assessment (HartCrowser, 1990, Table 3-2)

ABN's = Acid/Base Neutral Compounds
GC/FID = Gas Chromatograph with Flame Ionization Detector
SEMIVOL = Semivolatile
CMPDS = Compounds

Table 3.2
Summary of Chemicals of Concern

	Soil/Sediment	Ground Water
METALS:		
Arsenic	X	X
Chromium	X	
Lead	X	X
VOLATILE ORGANIC COMPOUNDS:		
Vinyl Chloride		X
Benzene		X
SEMIVOLATILE ORGANIC COMPOUNDS:		
TPAH	X	
Hexachlorobenzene	X	
Total PCB's	X	
Total Petroleum Hydrocarbons (TPH)	X	

NOTES:
TPAH = Total Polycyclic Aromatic Hydrocarbon
PCB = Polychlorinated Biphenyl

After HartCrowser, 1990a, Table 3-2

Table 3.3
Summary of Metals Ground-Water Data

Parameter		On-Site Concentration Range (ug/L)	Off-Site Concentration Range (ug/L)	Drinking Water Stds CMCL/PMCL (ug/L)
Arsenic	S	<5 to 73	<5 to 27	50/30
	D	<5 to 70	<5 to 45	
Lead	S	<5 to 40	<5 to 11	15/NP
	D	<5 to 12	<5 to 5	
Zinc	S	10 to 52	4 to 50	5000/NP
	D	3 to 110	8 to 28	

S = Shallow Wells (<25 feet deep)
D = Deep Wells (>25 feet deep)
CMCL = Current Maximum Contaminant Level in Drinking Water
PMCL = Proposed Maximum Contaminant Level in Drinking Water
NP = None Proposed

Note: This table is based on data given in HartCrowser (1989) and HartCrowser (1990a). More recent ground-water monitoring data is available for 1990 and 1991 monitoring events.

Table 3.4
Remedial Action Objectives at PACCAR's Renton Site

	Remedial Action Objective
Overall Objective	Attain a degree of cleanup that is protective of human health and the environment and use remedial actions in which treatment permanently and significantly reduces the volume, toxicity, or mobility of the contaminants to the maximum extent practicable.
Environmental Media	
Groundwater	For Human Health Prevent ingestion of water containing aresenic in excess of 30 ug/L and lead in excess of 5 ug/L. Prevent ingestion of water containing benzene in excess of 5 ug/L and vinyl chloride in excess of 2 ug/L.
Soil	For Human Health Prevent ingestion/direct contact with soil containing lead in excess of 1000 ppm, chromium in excess of 70 ppm, and arsenic in excess of 30 ppm. Prevent ingestion/direct contact with soil containing PCB's in excess of 10 ppm. Prevent ingestion/direct contact with soil having an average total HPAH site concentration in excess of 3.5 ppm. For Environmental Protection Remediate soils containing TPH in excess of 1,000 ppm as measured by GC/GID Method 8015-Extended quantified by phenanthrene response.
Surface Water	For Environmental Protection Control off-site migration of contaminants in storm-water runoff.
Sediments	For Environmental Protection Prevent hydraulic contact of surface water with sediments containing PCB's in excess of 1 ppm.

After HartCrowser, 1990a, Table 3-7

Table 3.5
Concentration Levels Required to Meet RAO's for Chemicals of Concern in Soil at PACCAR's Renton Site

	Risk-Based Criteria		PACCAR Near-Surface Soils		Puget Sound Background (b)			
	Average Concentration to Achieve 10^{-6} Lifetime Cancer Risk	Remediation Criterion Resulting in Stated Average (a)	Average	Upper 95%	Average	Upper 95%	TBC Criteria	Preliminary Remedial Action Objective
METALS:								
Total Arsenic	6.6	—	18	65	13	32	—	32 (c)
Total Chromium	8.3	—	76	279	43	68	—	68 (c)
Total Lead	—	—	737	4811	32	58	1000 (d)	1000 (d)
ORGANICS:								
CPAH's (e)	3.5	22	19	142	0.0	0.1	—	22 (f)
Total HPAH's (g)	6.7	35	35	239	0.1	0.2	—	35 (f)
Hexachlorobenzene (i)	25	400	<0.01	<1.0	<0.01	0.10	—	400 (f)
Total PCB's	5.5	92	0.03	2.0	0.002	0.005	10 (h)	10 (h)

Concentration values in mg/kg (ppm), dry weight basis. See Notes on next page

Table 3.5, continued.

Notes:

(a) If soils exceeding this concentration are remediated to approximate background levels, then the target site-wide average concentration will be met; calculations performed based on the worst case assumption that the statistical distribution of soil concentrations are equivalent to existing potentially exposed near-surface soils.
(b) Based on data collected by METRO and the University of Washington at Pilchuck Tree Farm (Snohomish County), Pack Forest (Pierce County), and Section 24 Site (King County). Data from Harper Owes, 1985, and METRO, unpublished data.
(c) Soil remediation criterion to achieve parity with regional background soils quality.
(d) TBC criterion based on a 1,000 ppm total lead concentration in soils which may result in increased blood lead levels in semi-residential and industrial land use areas; CDC, 1985, and EPA (1989a) and DSHS (1989), personal communications to HartCrowser, 1989.
(e) CPAH's denote potentially carcinogenic polynuclear aromatic hydrocarbons (EPA B2 status and above), which include benzo(a)anthracene, benzo(a)pyrene, benzo(b) fluoranthene, benzo(k)fluoranthene, dibenzo(a,h)anthracene, and indeno (1,2,3-cd)pyrene.
(f) Soil remediation criterion resulting in achievement of the stated risk-based average concentration.
(g) HPAH's refer to total high-molecular weight polynuclear aromatic hydrocarbons; risk-based criteria are based on the observed correlation between CPAH's and HPAH's.
(h) TBC criterion based on EPA's PCB Spill Cleanup Policy (50 CFR 761) for sites without access restrictions; the 10 ppm PCB criterion for soils is more restrictive than the risk-based criterion.
(i) Hexachlorobenzene was not detected in near-surface soils.

(After HartCrowser, 1990a, Table 3-6)

Table 3.6
Ground-Water Cleanup Levels
WAC 173-340-720, Method B

Chemical	Cleanup Level (mg/L)	Hazard Index	Excess Cancer Risk	Notes
Arsenic	0.005	0.3	0	Cleanup level based on background concentrations for state of Washington. (Note: Cancer risk due to arsenic at background levels is 1 x 10^{-4}.)
Vinyl Chloride	0.0004	NA	1 x 10^{-5}	Cleanup level based on concentration derived using procedures in WAC 173-340-720 (3)(a)(ii)(B) and (7).
Benzene	0.005	NA	.3 x 10^{-5}	Cleanup level based on applicable state and federal law.
Lead	0.005			Cleanup level based on applicable state and federal law and prevention of unacceptable blood lead levels.

NA = Not Applicable

Table 3.7
Surface-Water Cleanup Levels
WAC 173-340-730, Method B

Chemical	Cleanup Level (mg/L)	Hazard Index	Excess Cancer Risk	Notes
Chromium VI	0.011	NA	NA	Cleanup level based on Section 304 of the Clean Water Act.
Lead	0.001	NA	NA	Cleanup level based on Section 304 of the Clean Water Act.
Copper	0.007	NA	NA	Cleanup level based on Section 304 of the Clean Water Act.
Nickel	0.080	NA	NA	Cleanup level based on Section 304 of the Clean Water Act.
Zinc	0.059	NA	NA	Cleanup level based on Section 304 of the Clean Water Act.

NA = Not Applicable

Note: For stormwater discharges at the PACCAR site, a water hardness value of 50 mg/L as $CaCO_3$ was used to calculate cleanup levels under applicable state and federal laws. This value was based on an average specific conductance value in Johns Creek of 120 umhos/cm, calculated from measurements made during the remedial investigation, and the correlation (r^2 = 0.99) of conductance with hardness reported within the Cedar River basin (Metro, 1982).

Table 3.8
Soil Cleanup Levels
WAC 173-340-740, Method B

Chemical	Cleanup Level (mg/kg)	Hazard Index	Excess Cancer Risk	Notes
Arsenic	20	1×10^{-1}	0	Cleanup level based on background concentrations for state of Washington. (Note: Cancer risk due to arsenic at background levels is 1×10^{-5}.)
Chromium VI	100	2×10^{-1}	0.1×10^{-5}	Cleanup level based on health risks associated with inhalation of resuspended dust
Lead	250	NA	NA	Cleanup level based on preventing unacceptable blood lead levels

Table 3.8, Continued ...

Chemical	Cleanup Level (mg/kg)	Hazard Index	Excess Cancer Risk	Notes
CPAH	1	NA	1.2×10^{-5}	Cleanup level based on concentration derived using the procedures in WAC 173-340-740 (3)(a)(iii)(B), and adjusted downward to account for multiple hazardous substances
PCB's	1	NA	0.3×10^{-5}	Cleanup level based on concentration derived using the procedures in WAC 173-340-740 (3)(a)(iii)(B)
TPH (gasoline)	100	NA	NA	Cleanup level based on protection of ground water
TPH (diesel)	200	NA	NA	Cleanup level based on protection of ground water

Table 3.8, Continued ...

Chemical	Cleanup Level (mg/kg)	Hazard Index	Excess Cancer Risk	Notes
TPH (other)	200	NA	NA	Cleanup level based on protection of ground water

NA = Not Applicable
TPH (gasoline) to be measured using EPA Method 8015 Modified
TPH (diesel) to be measured using EPA Method 8015 Modified
TPH (other) to be measured using EPA Method 8015 Modified

Table 4.1
Preliminary Remedial Alternatives

Media	Alternative	Description
Ground water	1. Monitoring	Semi-annual and annual sampling of monitoring wells
	2. Institutional Controls	Restrict ground-water use
	3. Diversion	Slurry wall through shallow ground-water zone
	4. Containment	Slurry wall through shallow and deep ground-water zones
	5. Pump and Treat	Ground-water from shallow and deep zones
	6. In Situ Treatment	Biological treatment of benzene and vinyl chloride in ground water from shallow and deep zones
Soil	1. Monitoring	Monitor fugitive dust emissions
	2. Institutional Controls	Restrict site access and monitor fugitive dust emissions
	3. Excavation/disposal	Excavate soil and dispose of off-site
	4a. Rapid Treatment	Soil washing for metals; low temperature thermal treatment of slurry biotreatment of HPAH and petroleum hydrocarbons
	4b. Slow Treatment	Soil leaching for metals; biotreatment of HPAH's and petroleum hydrocarbons
	5. Stabilization	Excavate and stabilize soil with cement
	6. In situ stabilization/treatment	Pressure grouting of soils with metals; in situ biotreatment of petroleum hydrocarbons
	7. Cover	Place protective cover over most of the site
	8. Cover/disposal of hot spots	Excavate hot spots and dispose of soil off-site; place cover over most of site
	9. Cover/treatment of hot spots	Excavate hot spots and treat soil on-site; place cover over most of site
	10. Cover/stabilization of hot spots	Excavate hot spots and stabilize soil with cement on-site; place cover over most of site
	11. Restrict access/disposal of hot spots	Excavate hot spots and dispose of soil off-site; restrict site access
		Continued on next page ...
Sediment	1. Monitoring	Monitor quality of surface water flowing off-site from ditch
	2. Vegetation of ditch	Vegetate ditch to reduce potential for sediment migration
	3. Line/fill ditch	Cover sediment with geotextile and sand and gravel

Table 4.1, Continued ...

Media	Alternative	Description
	4. Excavate/on-site containment	Excavate and contain sediment on-site with cover
	5. Excavate/off-site containment	Excavate and dispose of off-site

After HartCrowser, 1990a, Table 5-4

Table 4.2
Alternatives Retained for Detailed Analysis

Media	Alternative	Description	Present Worth Cost
Ground water	1. Monitor	Monitor selected wells; implement health and safety program	$ 940,000
	2. Institutional Controls	Monitor selected wells; restrict on-site ground-water use; implement health and safety program	$ 1,130,000
	5. Pump and Treat	Monitor selected monitoring wells; pump 15 wells in shallow ground-water zone; pump 5 wells in deep ground-water zone (wells would be placed within the Cedar River Catchment area along the western site property boundary); use air stripping treatment for vinyl chloride and benzene; use oxidation/reduction and filtration for arsenic and lead	$ 2,900,000
Soil	1. Monitor	Monitor fugitive dust emissions; implement health and safety program for activities which will disturb soil	$ 6,690,000
	2. Institutional Controls	Monitor fugitive dust emissions; implement health and safety program for activities which will disturb soil; restrict site access	$ 6,820,000
	4b/5. Slow Treatment and Stabilization of Soils Above RAO's	Use land treatment for soils with petroleum hydrocarbons and possibly HPAH's (20,000 yds^3); use cement stabilization for metals and HPAH's (160,000 yds^3); implement health and safety program for activities which will disturb soil; install monitoring wells in areas where treated soils are placed	$19,240,000
	7. Containment	Use combination of pavement and structural fill if site development occurs; use combination of structural fill and geomembrane if site development does not occur; about 55 acres of the site would be covered	$ 5,740,000
	8. Excavate and Dispose of PCB Contaminated Soil and Dangerous Waste Soil Containing Lead	Excavation and off-site disposal of up to 700 yds^3 of soil with PCB concentrations greater than 10 ppm and about 10 yds^3 containing EP toxicity test leachable lead	$ 240,000
	9/10. Containment with Treatment and Stabilization of Hot Spots	Use pavement and structural fill cover with: Biotreatment of soils in petroleum hydrocarbon and possibly HPAH hot-spot areas (7,800 yds^3); stabilize metals and HPAH hot spots (20,700 yds^3); install monitoring wells in areas where treated soils are placed	$ 7,670,000
Sediment	3. Fill Ditch	Place geotextile and granular import fill in ditches; reconstruct site drainage	$ 30,000
	5. Excavate and dispose of sediments	Excavate sediments (up to 700 yds^3) containing greater than 1 ppm PCB's and dispose of off-site	$ 270,000

After HartCrowser, 1990a, Table 6-1

Table 4.3
Expectations for Superfund Remedial Actions

The following expectations guide the decisionmaker in determining what method (or combination of methods) is protection is appropriate for a particular site or operable unit (EPA, 1989b, Exhibit 1.1):

The objective of the Superfund program is to select remedies that provide reliable, effective protection over the long term. To meet this objective, remedies should either reduce all wastes to health-based levels or manage contaminants to such an extent that there is a high degree of certainty that future exposures will not harm human health or the environment.

Treatment is the preferred means by which to address the principal threats posed by a site, wherever practicable. Principal threats are characterized as areas contaminated with high concentrations of toxic compounds, liquids, and other highly mobile materials. Principal threats may include contaminated media (e.g., ground water, sediments, or soil) that pose significant risk of exposure.

The most appropriate remedy for a specific site frequently will be a combination of treatment and containment.

Containment is more likely to be appropriate for low concentrations of materials and immobile wastes that do not pose substantial long-term threats, for example:

Wastes of which the contaminants are near health-based levels or that are substantially immobile or can otherwise can be reliably contained over long periods of time;

Wastes that are technically difficult to treat, such as mixed wastes of widely varying composition or wastes dispersed over extraordinarily large sites, such as municipal landfills or mining sites, where treatment is impracticable; and

Wastes with characteristics such that a treatment-based remedy would increase overall risk to human health and the environment due to risks posed to workers, the community, or the environment during implementation.

Ground waters will be returned to their beneficial uses within a reasonable period of time, wherever practicable

Institutional controls (e.g., deed restrictions, prohibitions of well construction) are important in controlling exposures during remedial action implementation and as supplements to long-term engineering controls. Institutional controls alone should not substitute for more active measures (treatment or containment) unless such active measures are found to be impracticable.

Table 4.4
The EPA's Nine Remedial Evaluation Criteria

THRESHOLD CRITERIA				
	Overall Protection of Human Health and the Environment		Compliance with ARAR's	
	- How Alternative Provides Human Health and Environmental Protection		- Compliance with Chemical Specific ARAR's - Compliance with Action-Specific ARAR's - Compliance with Location-Specific ARAR's - Compliance with Other Criteria, Advisories, and Guidances (TBC's)	

Continued on next page ...

Table 4.4, continued

PRIMARY BALANCING CRITERIA				
Long-term Effectiveness and Permanence	Reduction of Toxicity, Mobility, or Volume Through Treatment	Short-term Effectiveness	Implementability	Cost
- Magnitude of Residual Risk - Adequacy and Reliability of Controls	- Treatment Process Used and Materials Treated - Amount of Hazardous Materials Destroyed or Treated - Degree of Expected Reductions in Toxicity, Mobility, and Volume - Degree to Which Treatment is Irreversible - Type and Quantity of Residuals Remaining After Treatment	- Protection of Community During Remedial Actions - Protection of Workers During Remedial Actions - Environmental Impacts - Time Until Remedial Action Objectives are Achieved	- Ability to Construct and Operate the Technology - Reliability of the Technology - Ease of Undertaking Additional Remedial Actions, if necessary - Ability to Monitor Effectiveness of Remedy - Ability to Obtain Approvals from Other Agencies - Coordination with Other Agencies - Availability of Off-site Treatment, Storage, and Disposal Services and Capability - Availability of Necessary Equipment and Specialists - Availability of Prospective Technologies	- Capital Costs - Operating and Maintenance Costs - Present Worth Cost

Continued on next page ...

Table 4.4, continued

MODIFYING CRITERIA				
	State (EPA) Acceptance		Community Acceptance	
	- Features of the Alternative the State (EPA) Supports - Features of the Alternative About Which the State (EPA) has Reservations - Elements of the Alternative the State (EPA) Strongly Opposes		- Features of the Alternative the Community Supports - Features of the Alternative About Which the Community has Reservations - Elements of the Alternative the Community Strongly Opposes	

From EPA, 1989, Table Exhibit 2-2.

Table 4.5
Comparative Analysis of Soil Alternatives

	Baseline Condition with Monitoring (No. 1)	Baseline Condition with Monitoring and Institutional Controls (No. 2)	Slow Treatment and Stabilization (No. 4b/5)	Cover (No. 7)	Cover with Treatment and Stabilization of Hot Spots (No. 9/10)
Overall Protection of Human Health and the Environment	-	-	+	0	+
Compliance with RAO's and ARAR's	-	0	+	0	+
Short-term Effectiveness	-	0	0	+	+
Long-term Effectiveness	-	0	+	+	+
Reduction of Toxicity, Mobility, or Volume	-	-	+	-	+
Implementability	+	0	0	+	0
Cost	+	+	-	0	-
Overall Analysis	-	0	0+	0+	+

Table 4.5, continued

+ = Positive 0 = Neutral - = Negative	Note:	No comparative analysis was performed in Soil Alternative No. 8 (excavate/dispose of soils contaminated with PCB's and Dangerous Waste levels of lead) as this alternative will be accomplished for any selected site remediation plan.

From HartCrowser, 1990a, Table 6-4(b).

Table 4.6
Comparative Analysis of
Ground-Water Remediation Alternatives

	Baseline Condition with Monitoring (No. 1)	Baseline Condition with Monitoring and Institutional Controls (No. 2)	Pump and Treat (No. 5)
Overall Protection of Human Health and the Environment	-	-	+
Compliance with RAO's and ARAR's	-	0	+
Short-Term Effectiveness	0	0	0
Long-Term Effectiveness	0	0	+
Reduction of Toxicity, Mobility, or Volume	-	-	+
Implementability	+	+	0
Cost	+	+	-
Overall Analysis	0	0	+
+ = Positive 0 = Neutral - = Negative			

From HartCrowser, 1990a, Table 6-4(a).

Table 4.7
Comparative Analysis of Sediment Alternatives

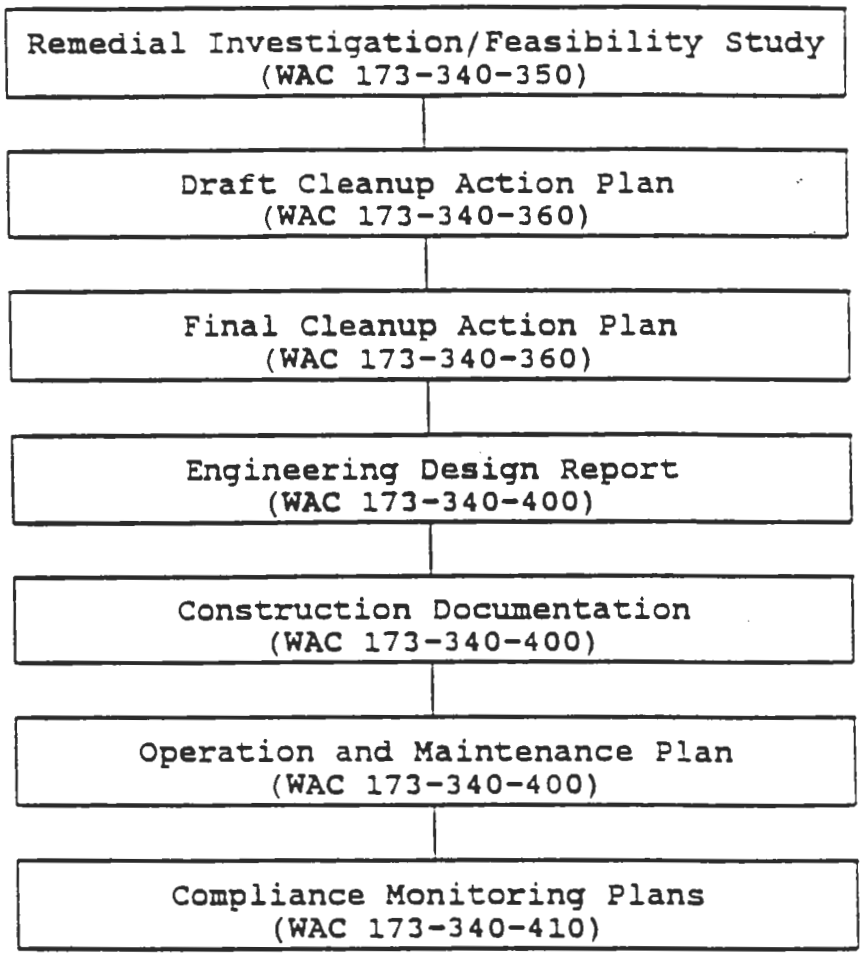
	Place Fill in Ditch (No. 3)	Excavate/Dispose of Sediments/Fill Ditch (No. 5)
Overall Protection of Human Health and the Environment	+	+
Compliance with RAO's and ARAR's	+	+
Short-term Effectiveness	+	+
Long-term Effectiveness	+	+
Reduction of Toxicity, Mobility, or Volume	-	-
Implementability	+	+
Cost	+	-
Overall Analysis	+	+
+ = Positive 0 = Neutral 0 = Negative		

From HartCrowser, 1990a, Table 6-4(c).

Table 5.1
Estimated Soil and Sediment Volumes

Medium	Estimated Volumes Exceeding MTCA Cleanup Levels		Estimated Volumes Exceeding Hot Spot Action Levels	
	Contaminant	In-Ground Volume (yd^3)	Contaminant	In-Ground Volume (yd^3)
Soil	Petroleum Hydrocarbons	90,000	Petroleum Hydrocarbons: GC/FID (8015-Extended) > 2,500 mg/kg and source control areas at well LW-4 and R&D UST	7,800
	CPAH > 1 mg/kg*	Mixed	CPAH > 100 mg/kg	240
	Lead > 250 mg/kg and Chromium > 100 mg/kg	Mixed	Lead > 3,000 mg/kg and Chromium > 600 mg/kg	2,000
	Arsenic > 20 mg/kg	Mixed	Arsenic > 100 mg/kg and Source area at U-2**	1,800
	Mixed TPH, HPAH, Lead, Chromium, Arsenic, and PCB	410,000		Subtotal: 11,840
			Dangerous Waste (Lead) Area	10
	PCB > 1 mg/kg	Mixed	PCB > 7 mg/kg	267
		Total: 500,000		Total: 12,117
Sediment	PCB > 1 mg/kg	700	PCB > 1 mg/kg	700

** U-2 refers to grid location as shown on various site plans.



Note: References in parentheses indicate WAC section requiring such documentation.

Figure 1.1 - Documents Required Under the Model Toxics Control Act Regulation (WAC 173-340) Cleanup Process.

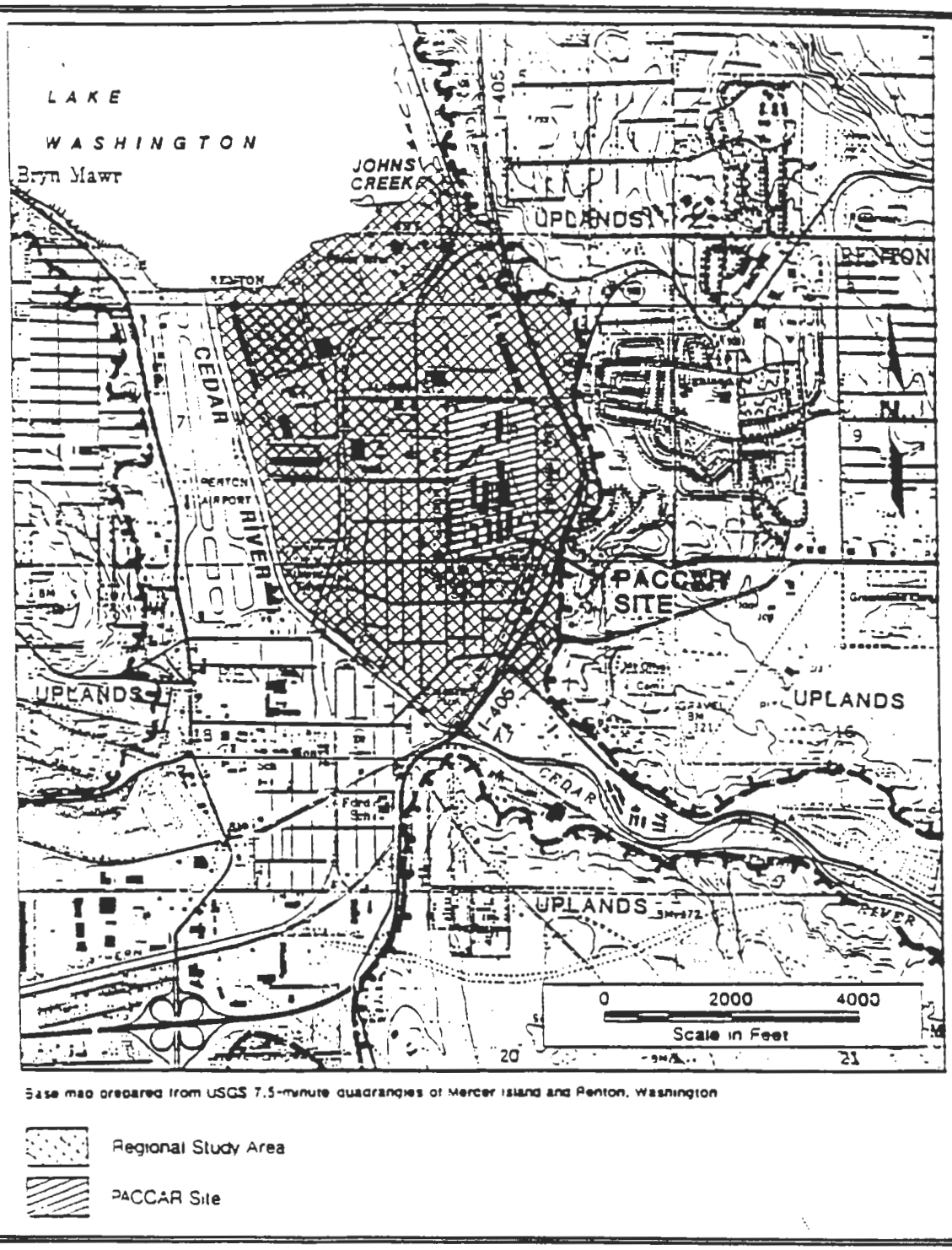


Figure 2.1 - Site Location.

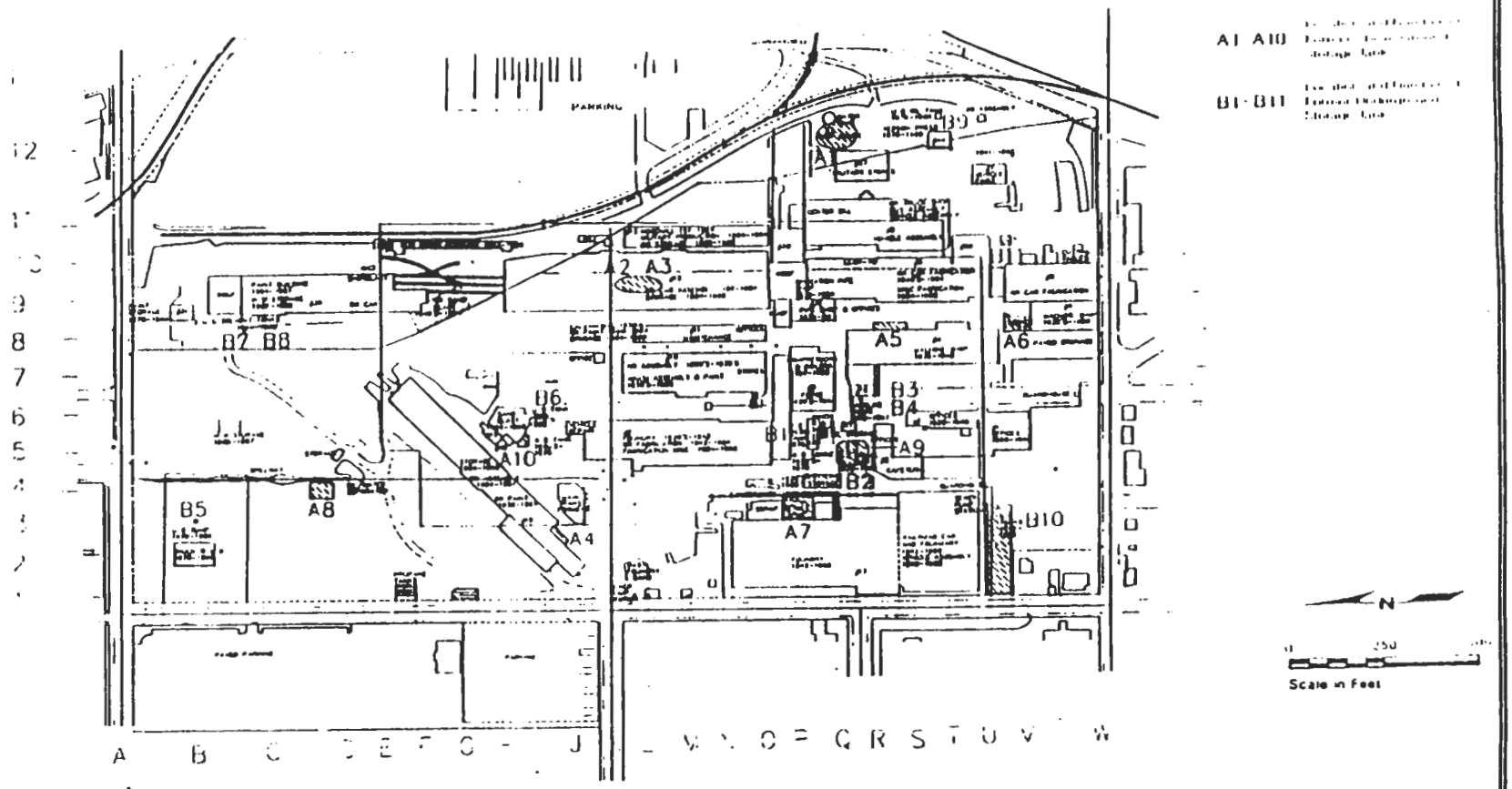


Figure 2.2 - Plant Layout.

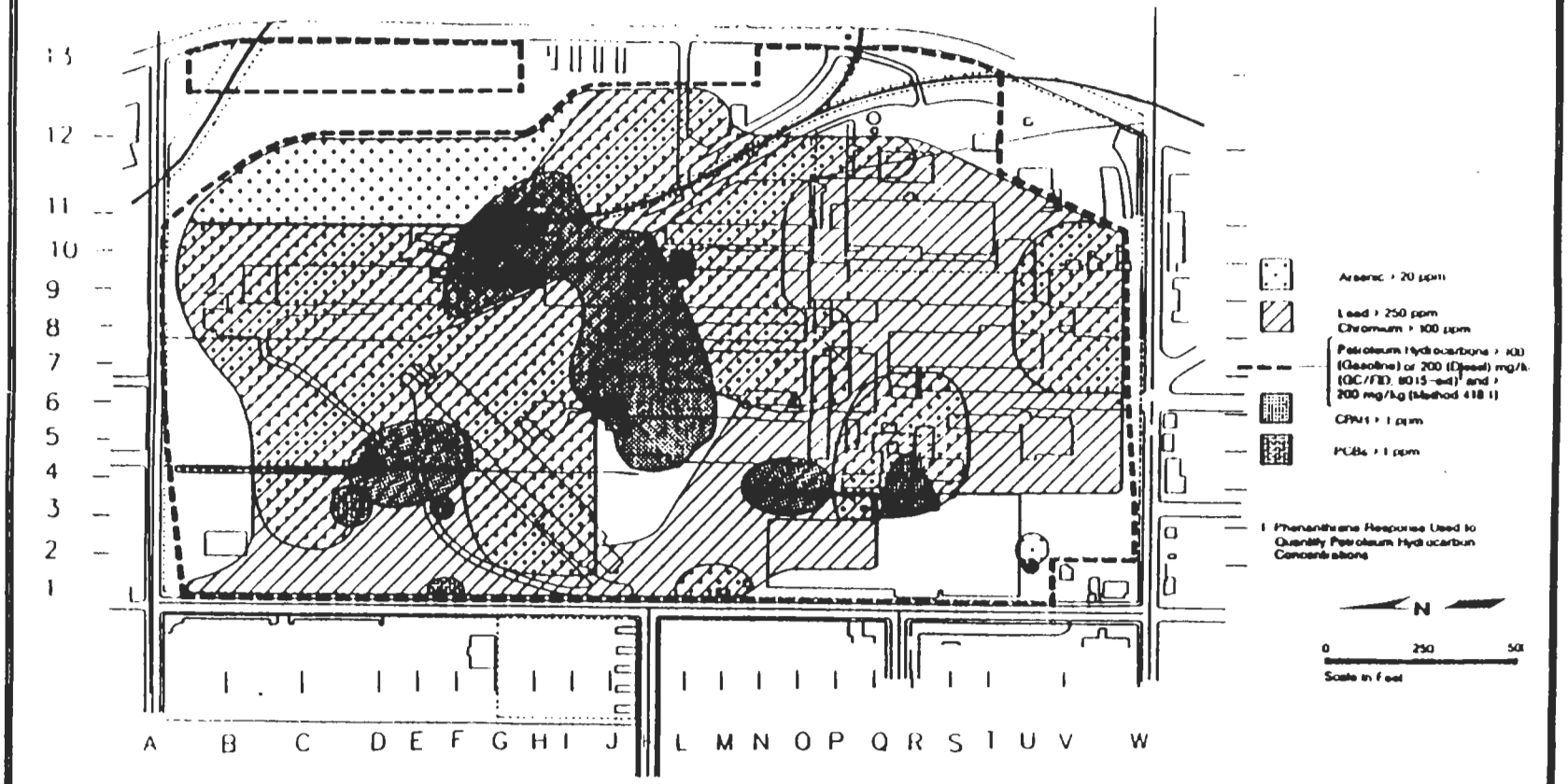


Figure 3.12 - Approximate Extent of Soil Contamination Above MTCA Cleanup Levels.

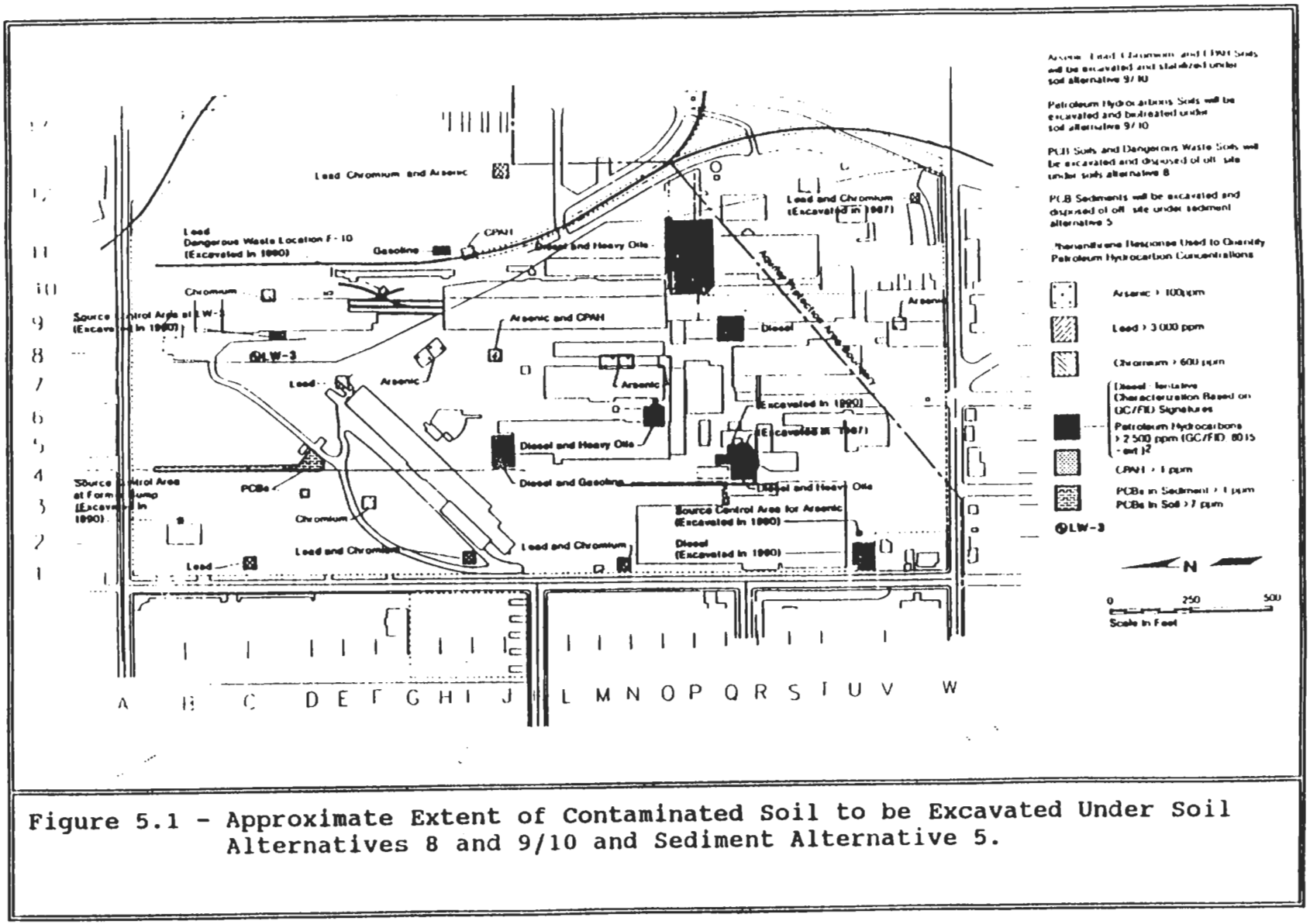


Figure 5.1 - Approximate Extent of Contaminated Soil to be Excavated Under Soil Alternatives 8 and 9/10 and Sediment Alternative 5.

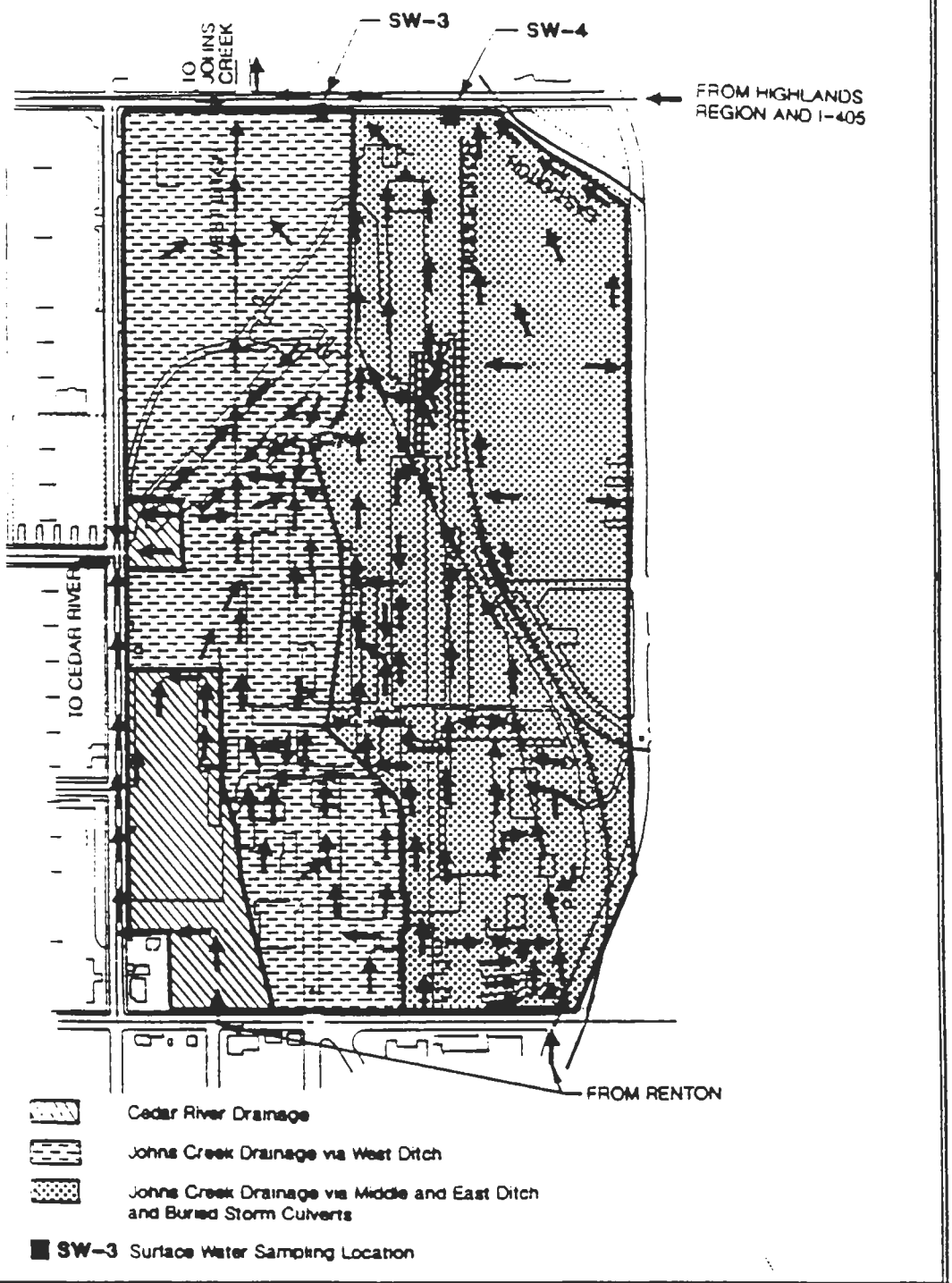


Figure 2.3 - Site Drainage.

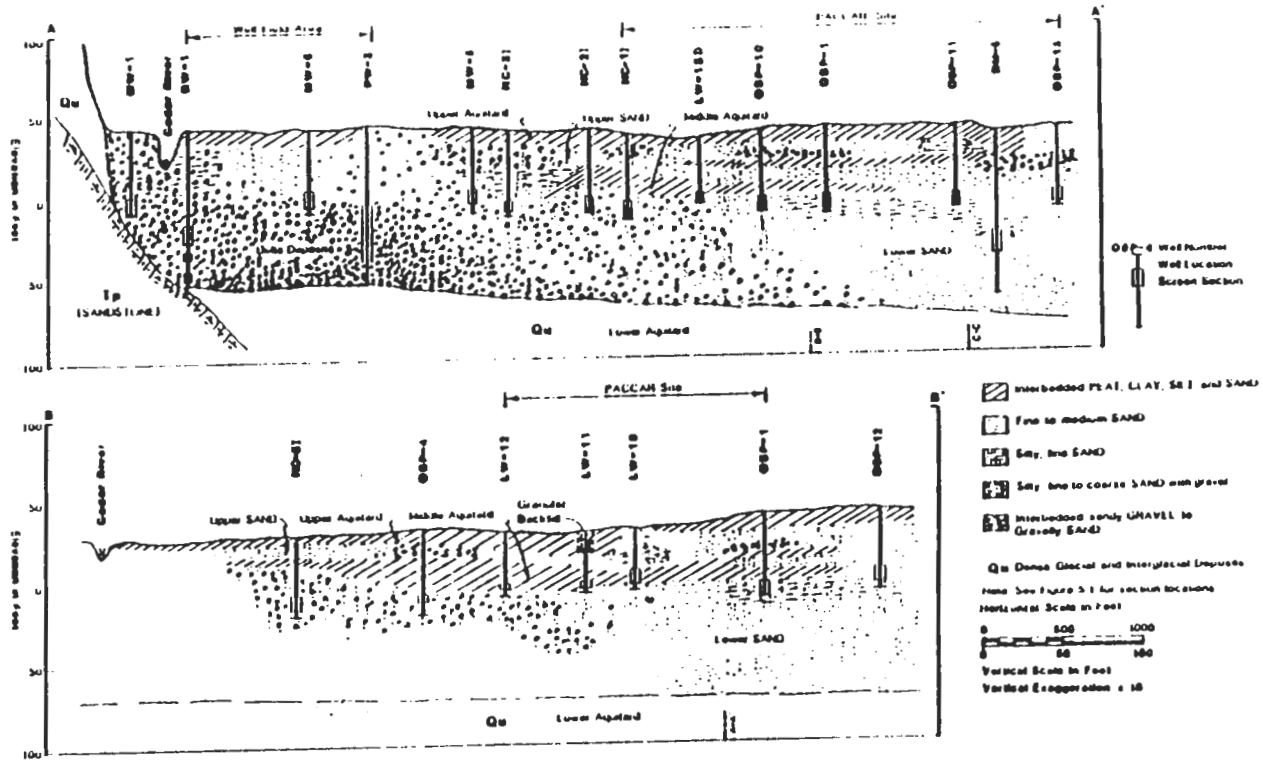


Figure 3.1 - Geologic Sections.

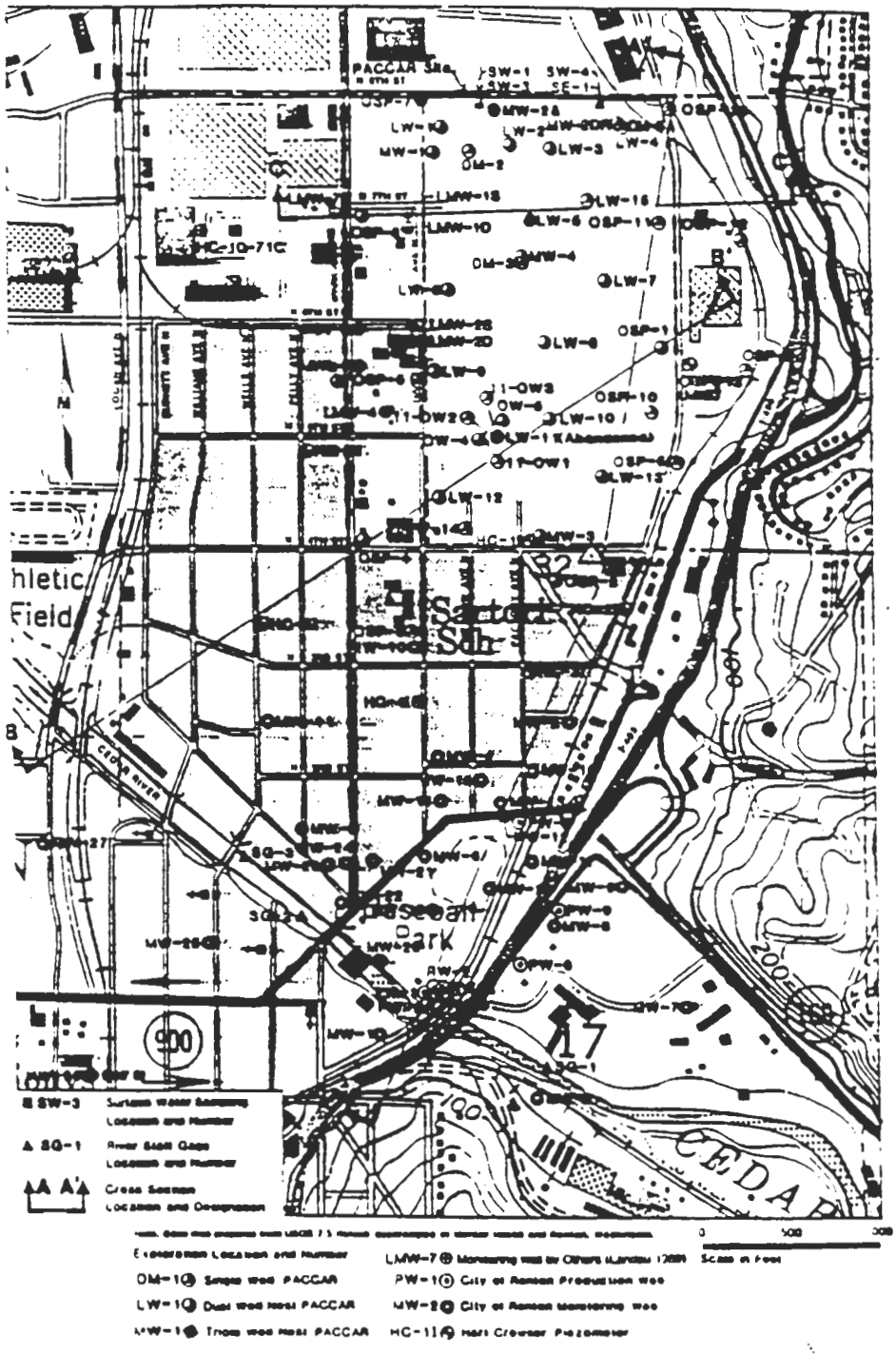


Figure 3.2 - Location of Geologic Sections.

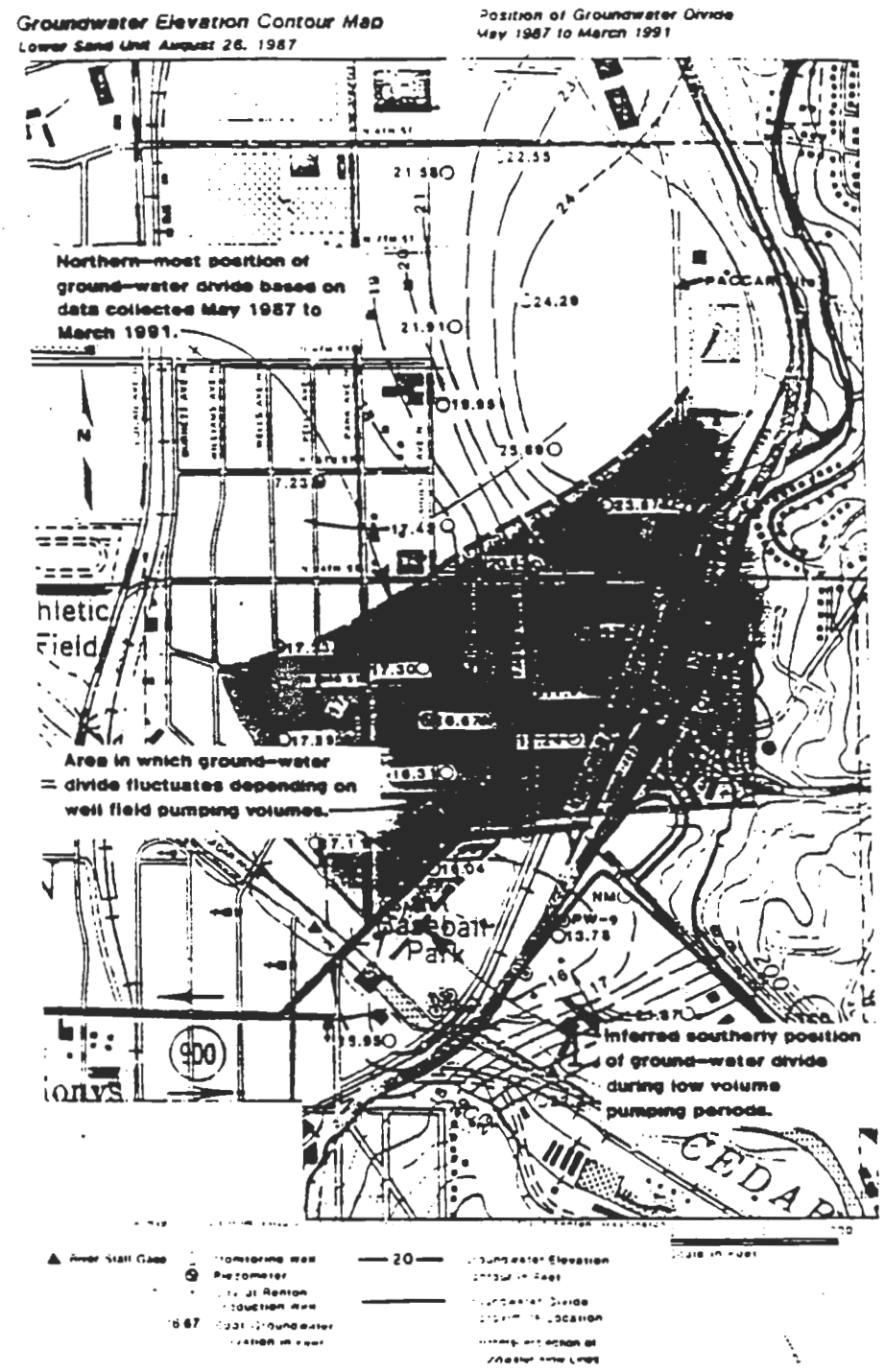


Figure 3.3 - Position of Ground-Water Divide.

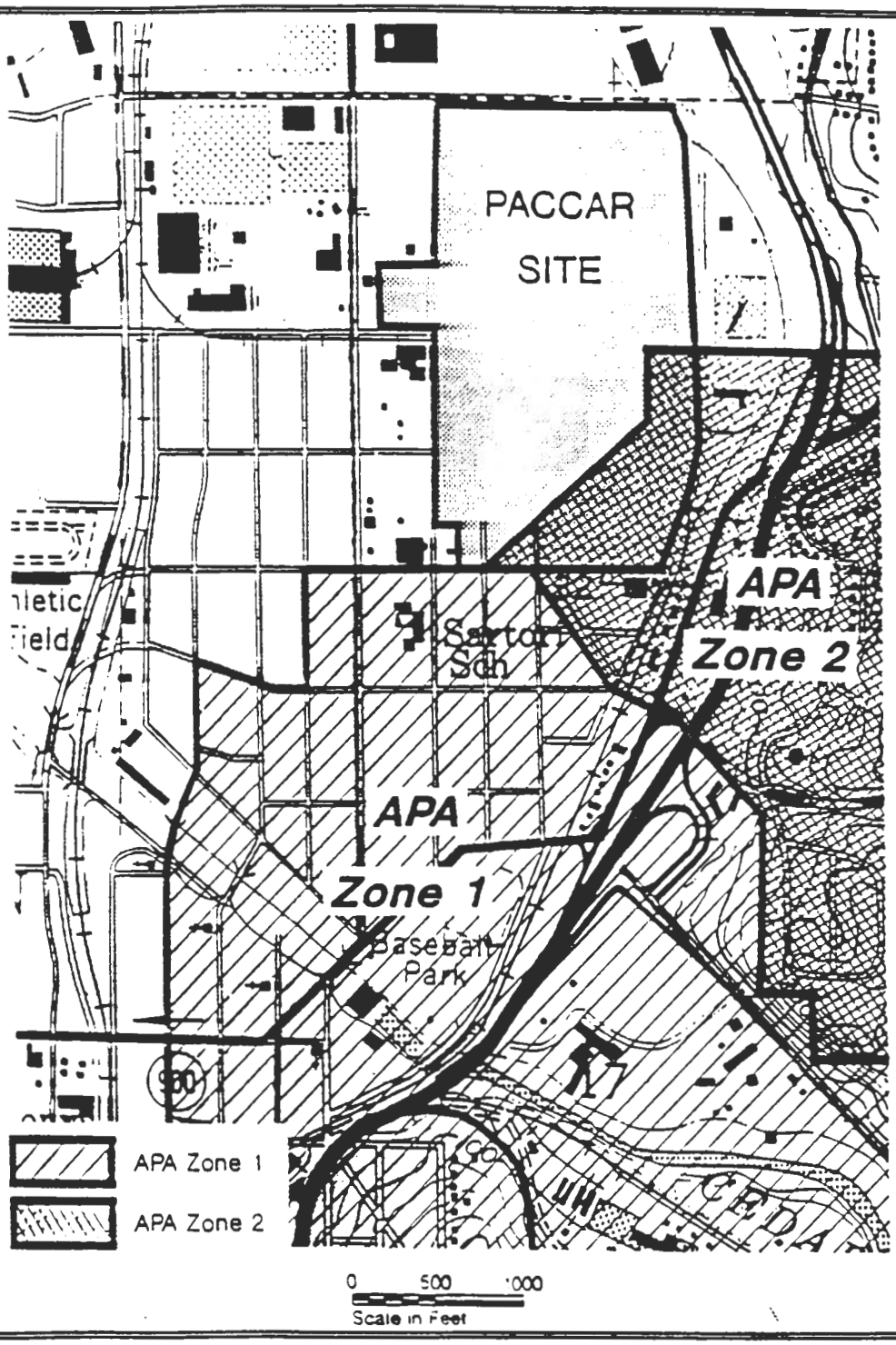


Figure 3.4 - Aquifer Protection Area (APA) Map.

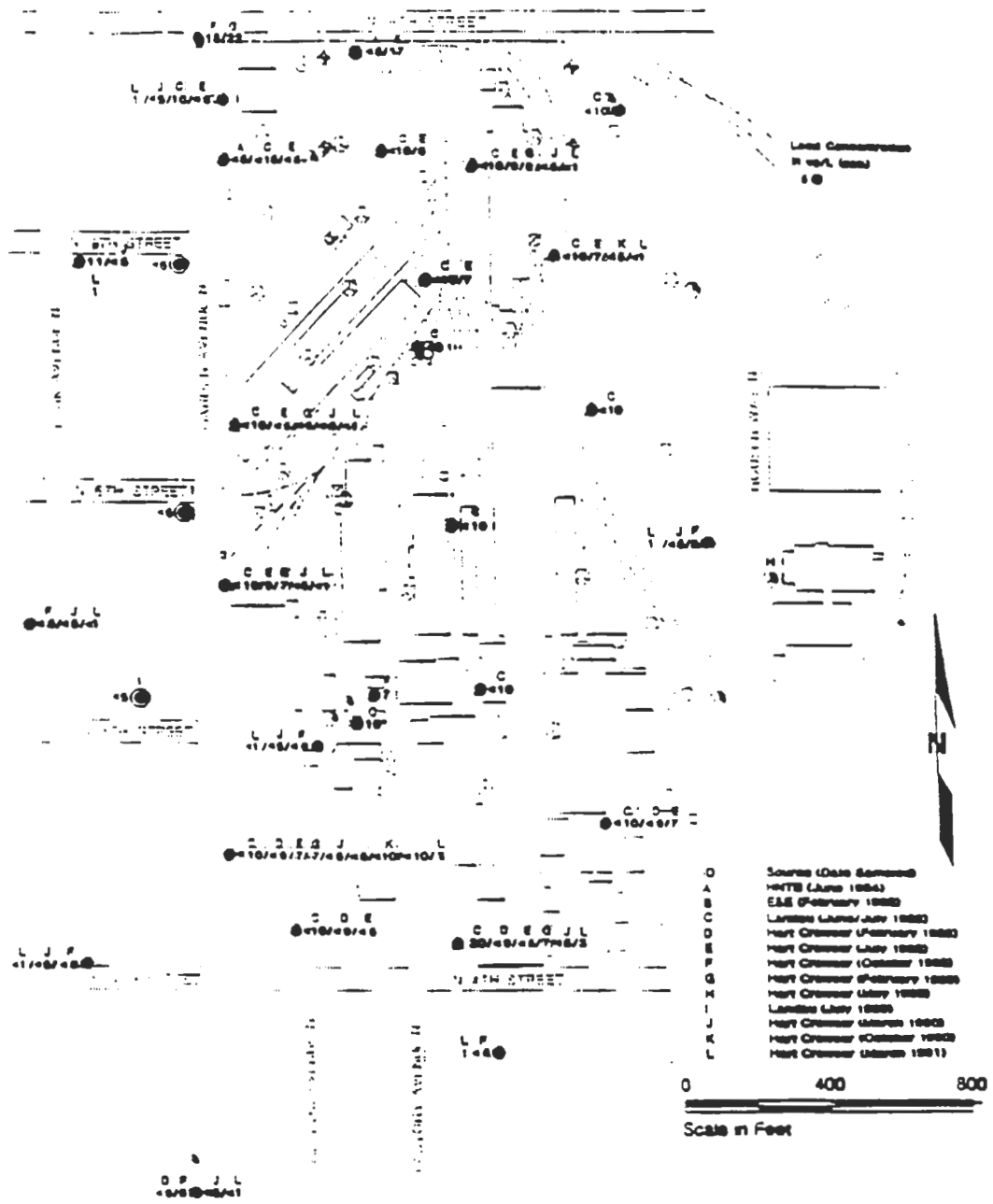


Figure 3.5 - Distribution of Lead in Ground Water from Shallow Wells.

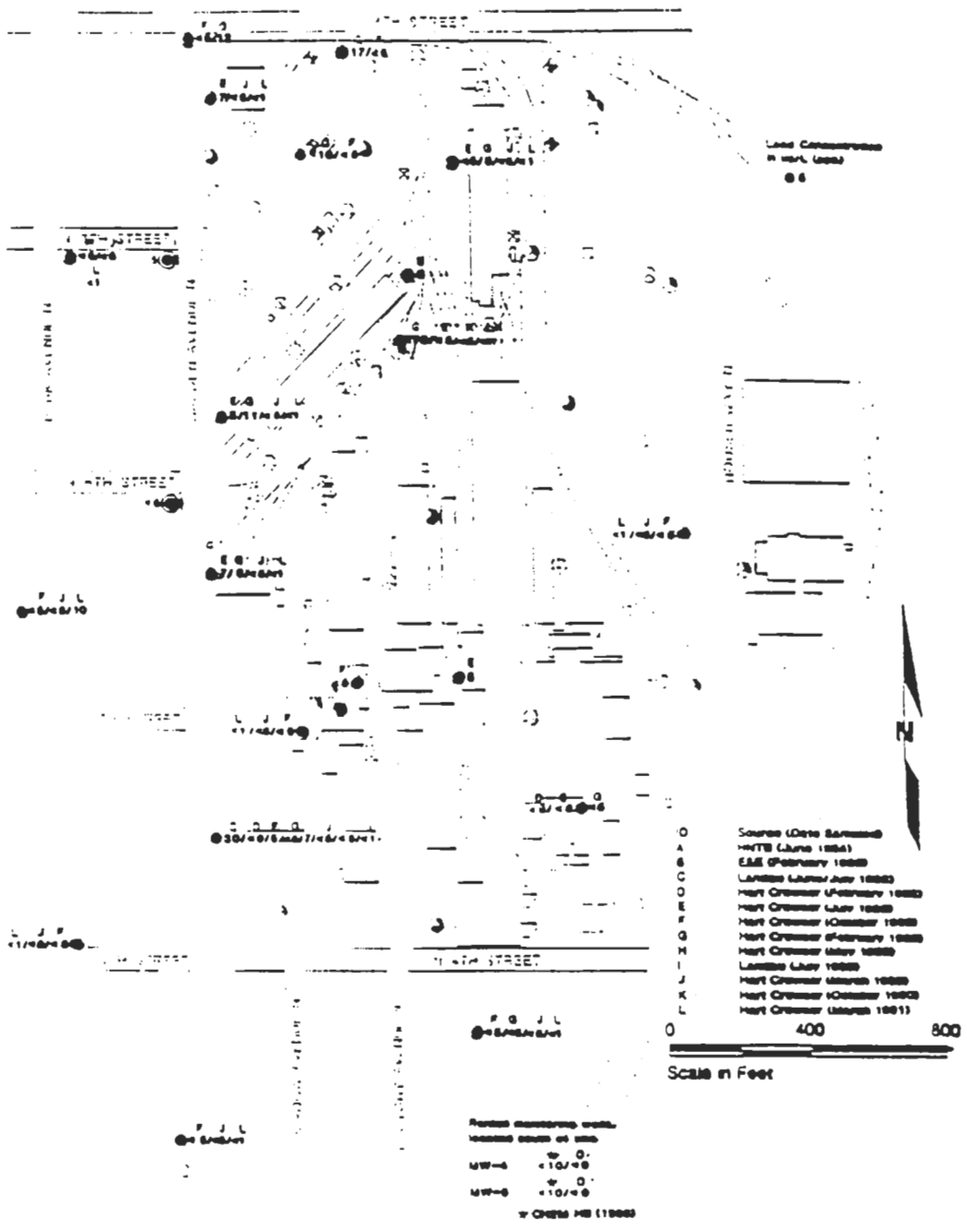


Figure 3.6 - Distribution of Lead in Ground Water from Deep Wells.

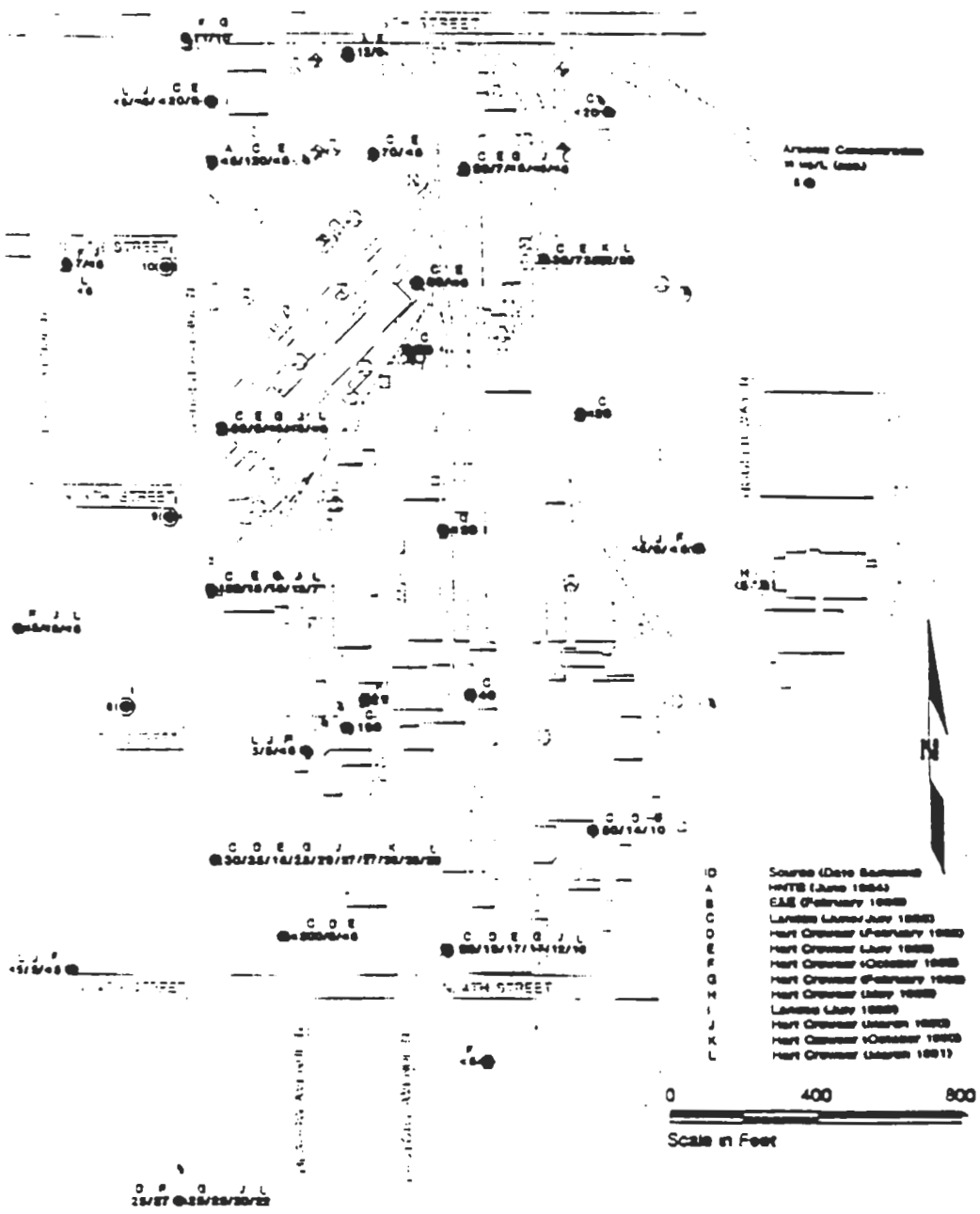


Figure 3.7 - Distribution of Arsenic in Ground Water from Shallow Wells.

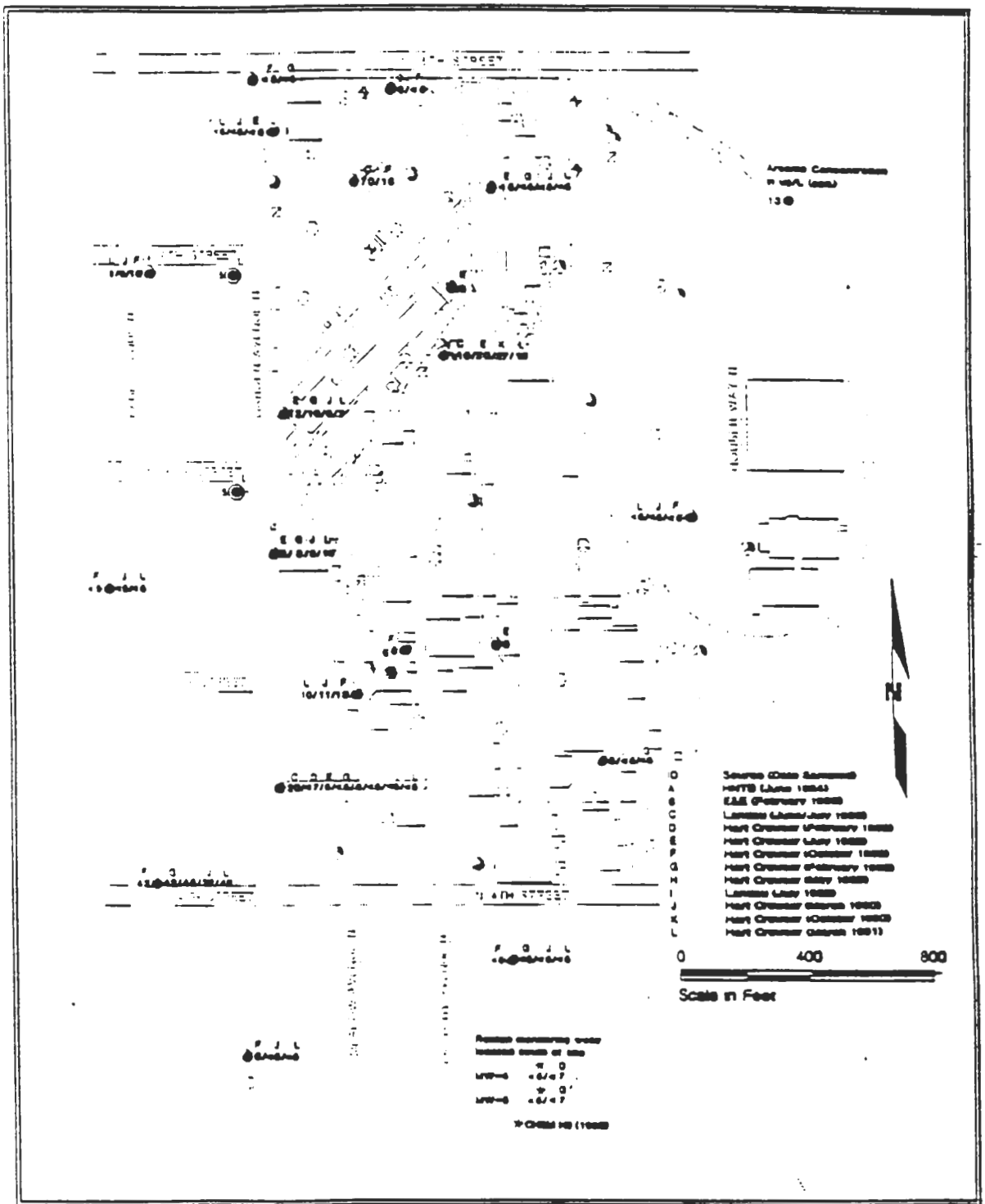


Figure 3.8 - Distribution of Arsenic in Ground Water from Deep Wells.

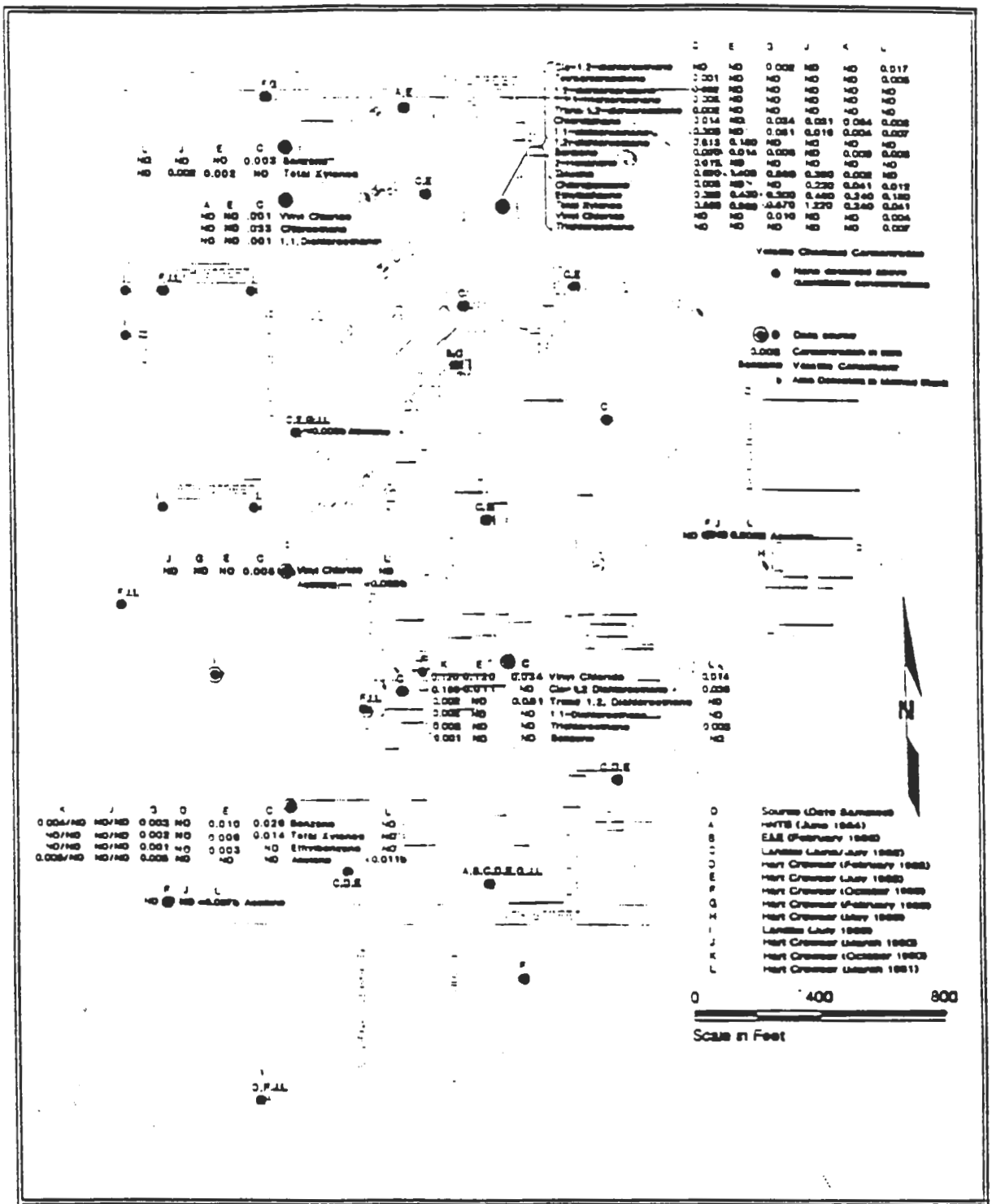


Figure 3.9 - Distribution of Volatile Chemicals in Ground Water from Shallow Wells.

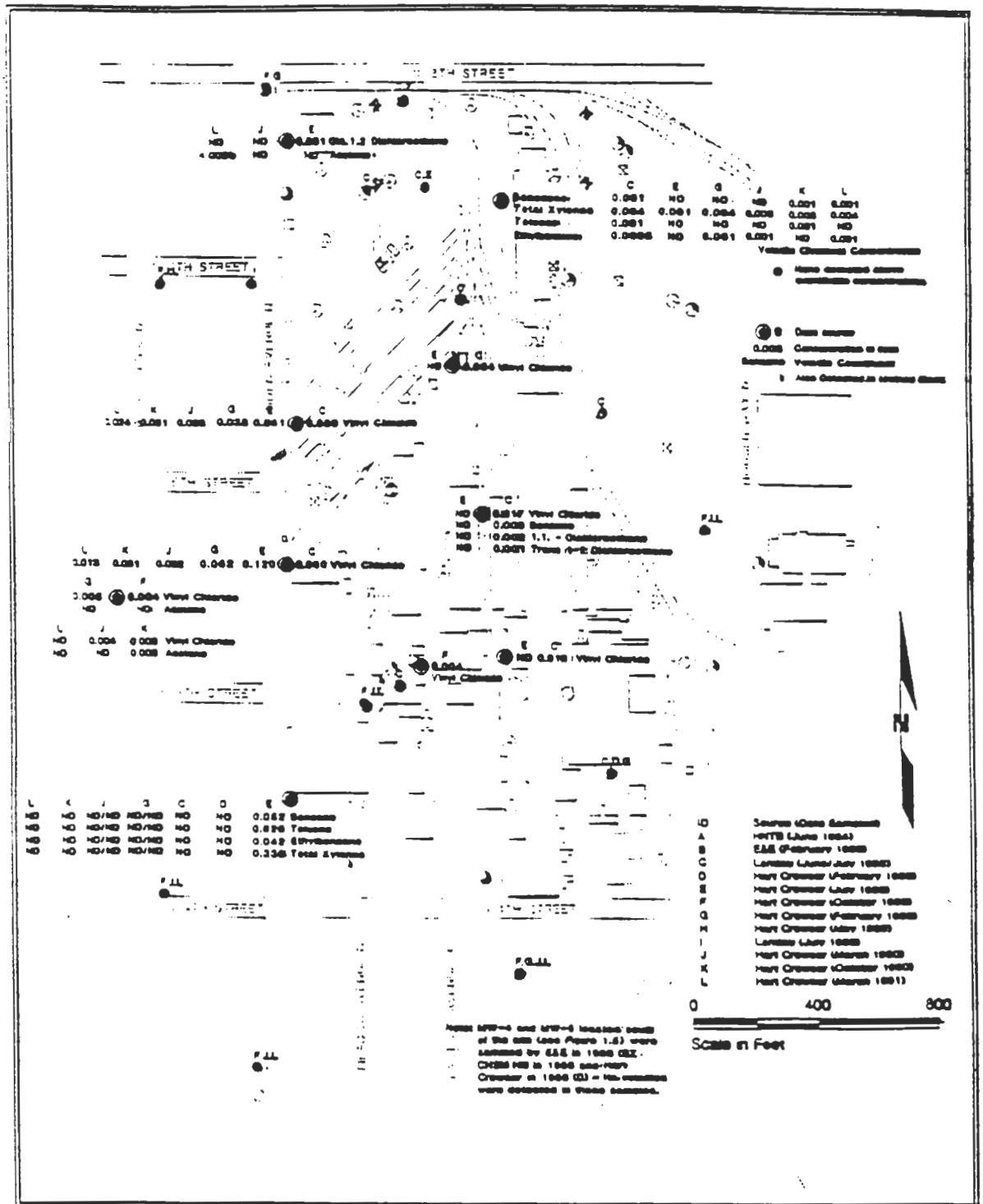


Figure 3.10 - Distribution of Volatile Chemicals in Ground Water from Deep Wells.

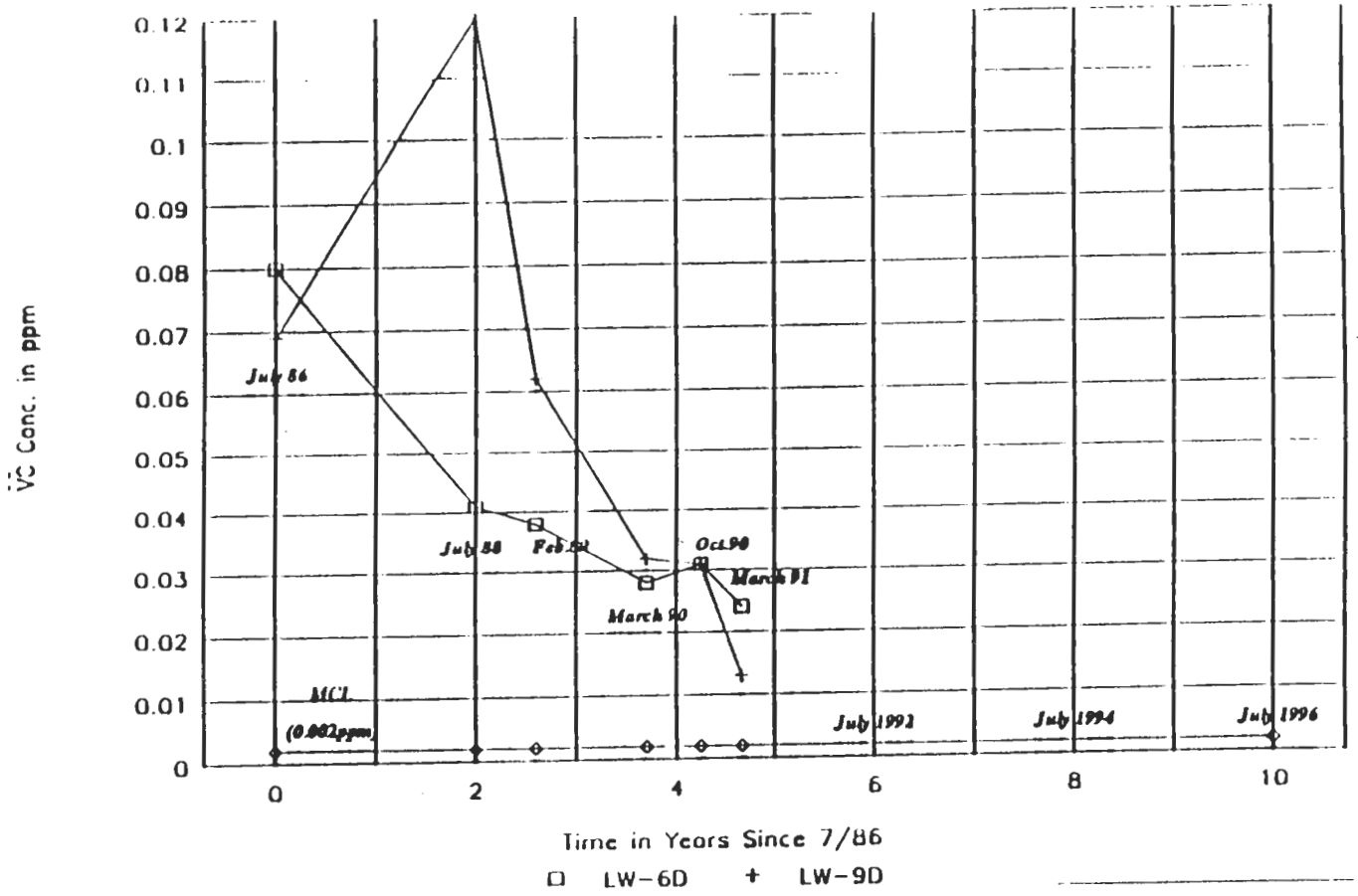


Figure 3.11 - Vinyl Chloride Concentrations versus Time in Ground Water from Wells LW-6D and LW-9D.

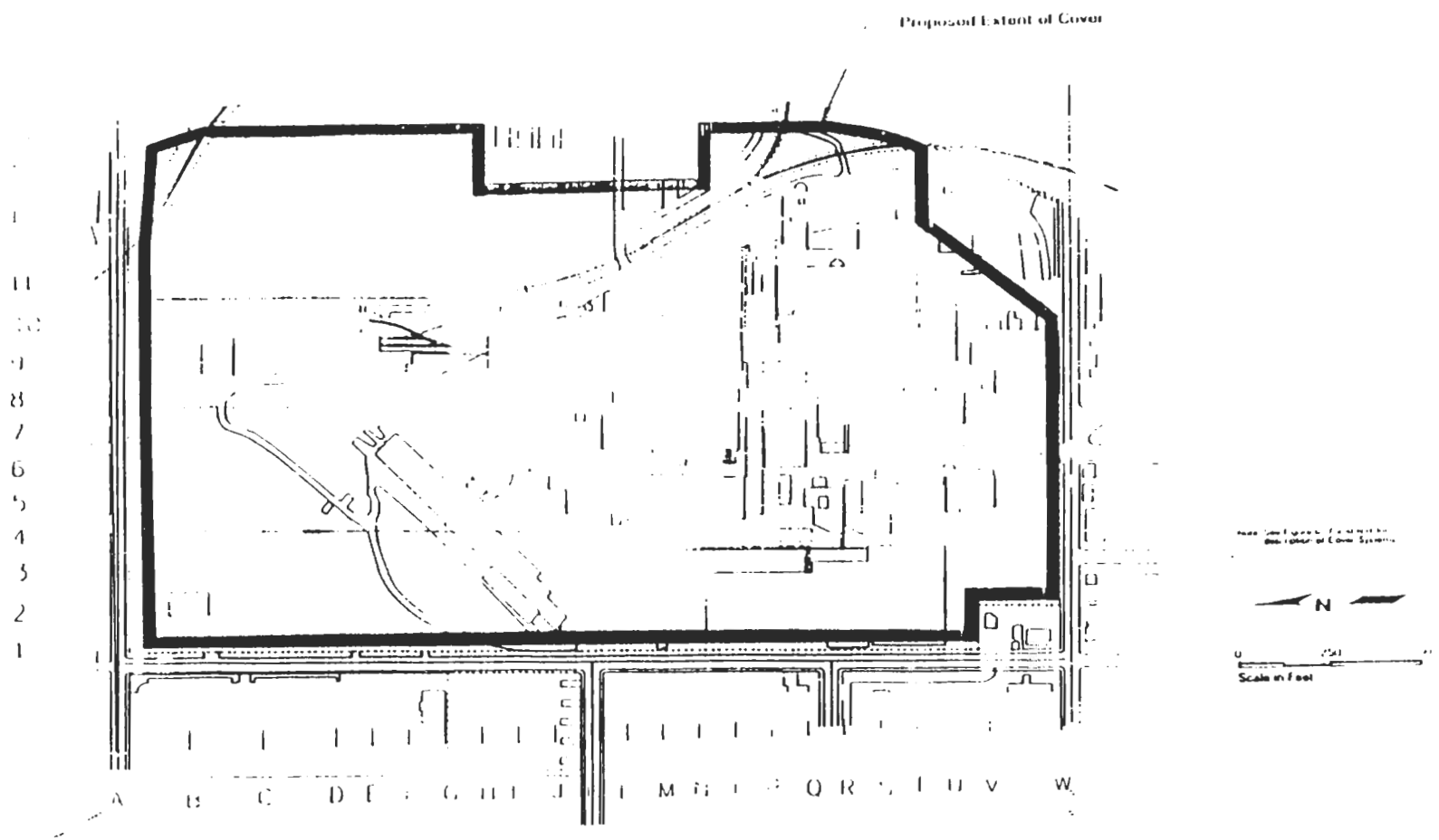


Figure 5.2 - Extent of Cover System.

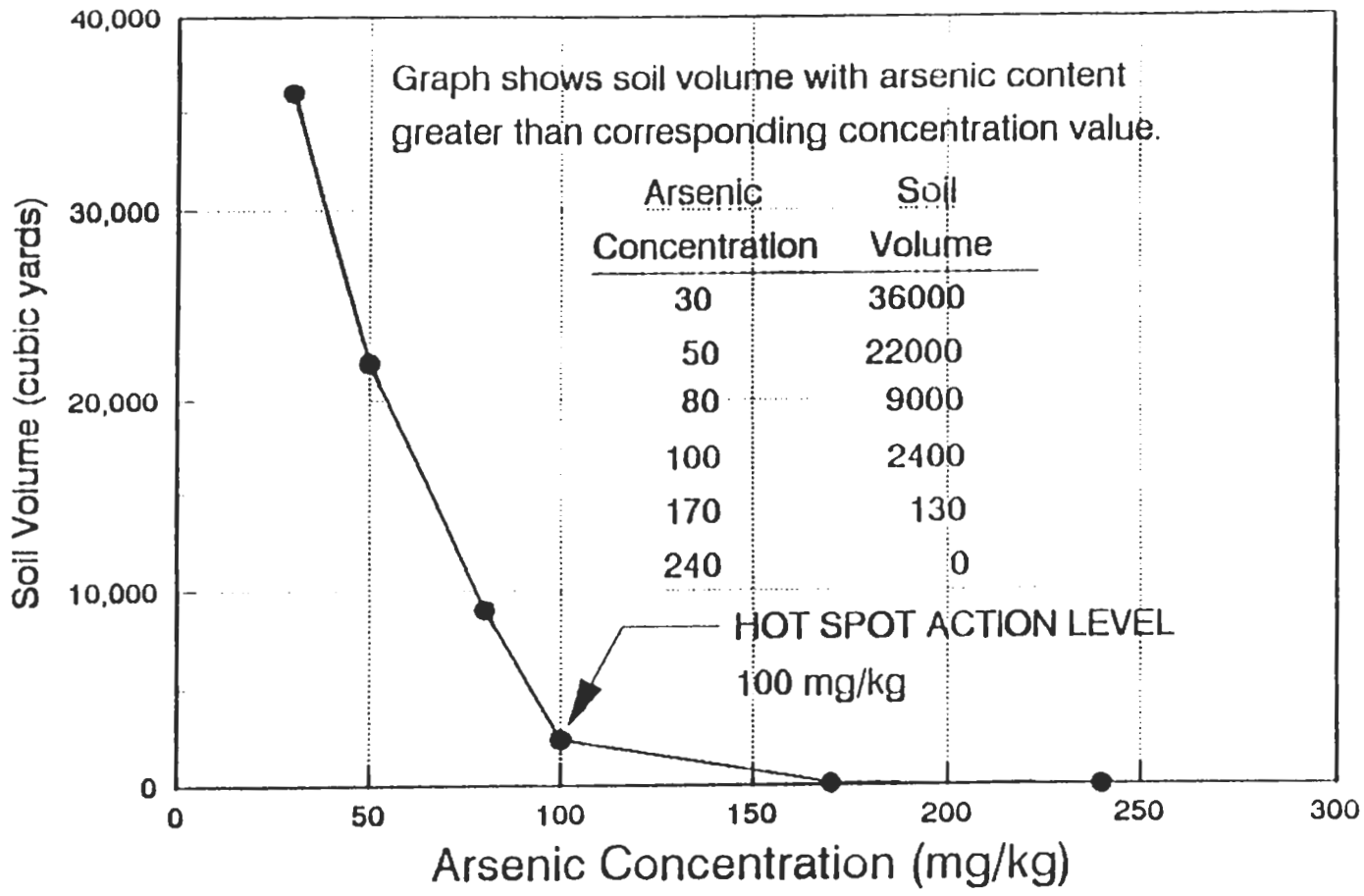


Figure 5.3 - Arsenic Concentration vs. Soil Volume.

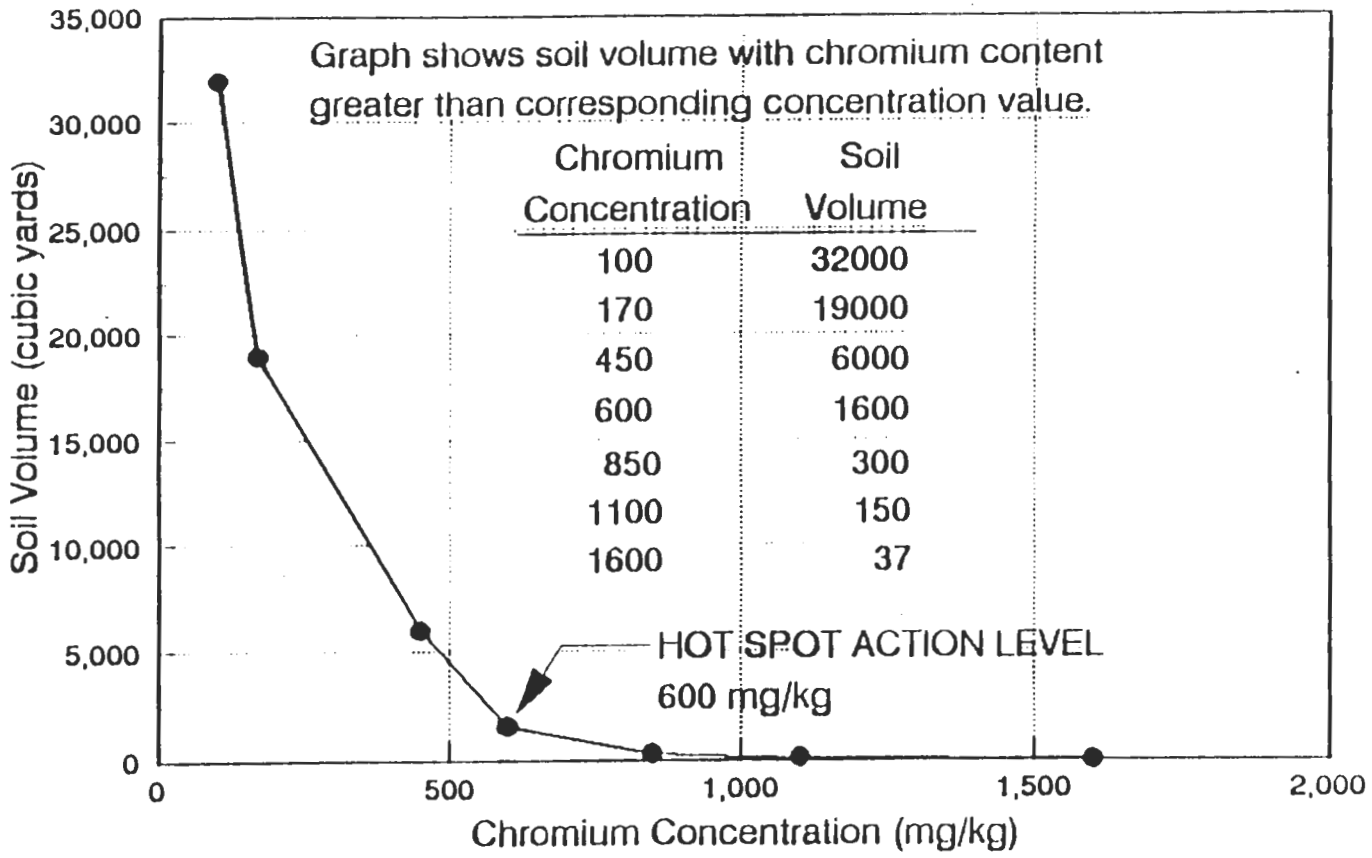


Figure 5.4 - Chromium Concentration vs. Soil Volume.

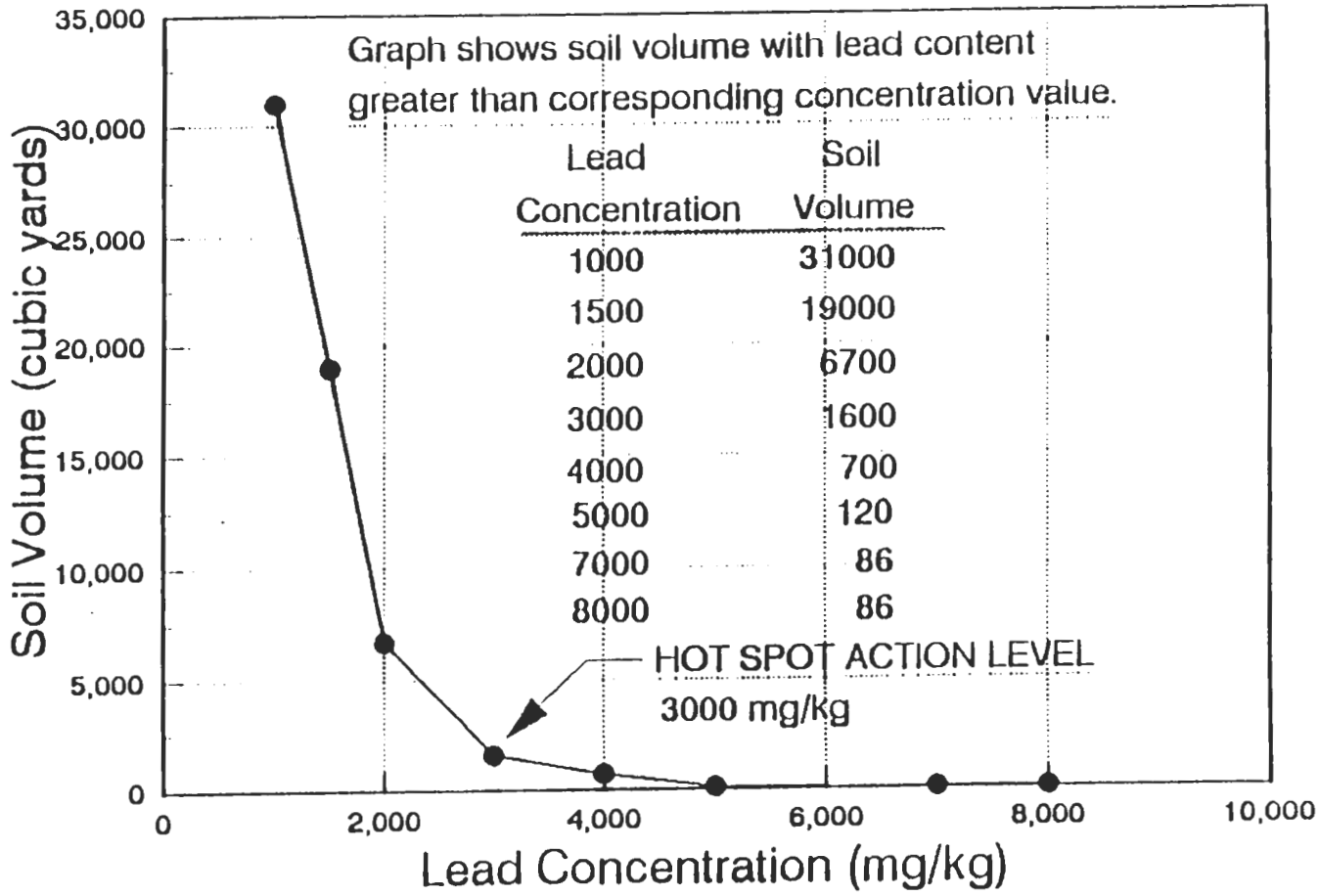


Figure 5.5 - Lead Concentration vs. Soil Volume.

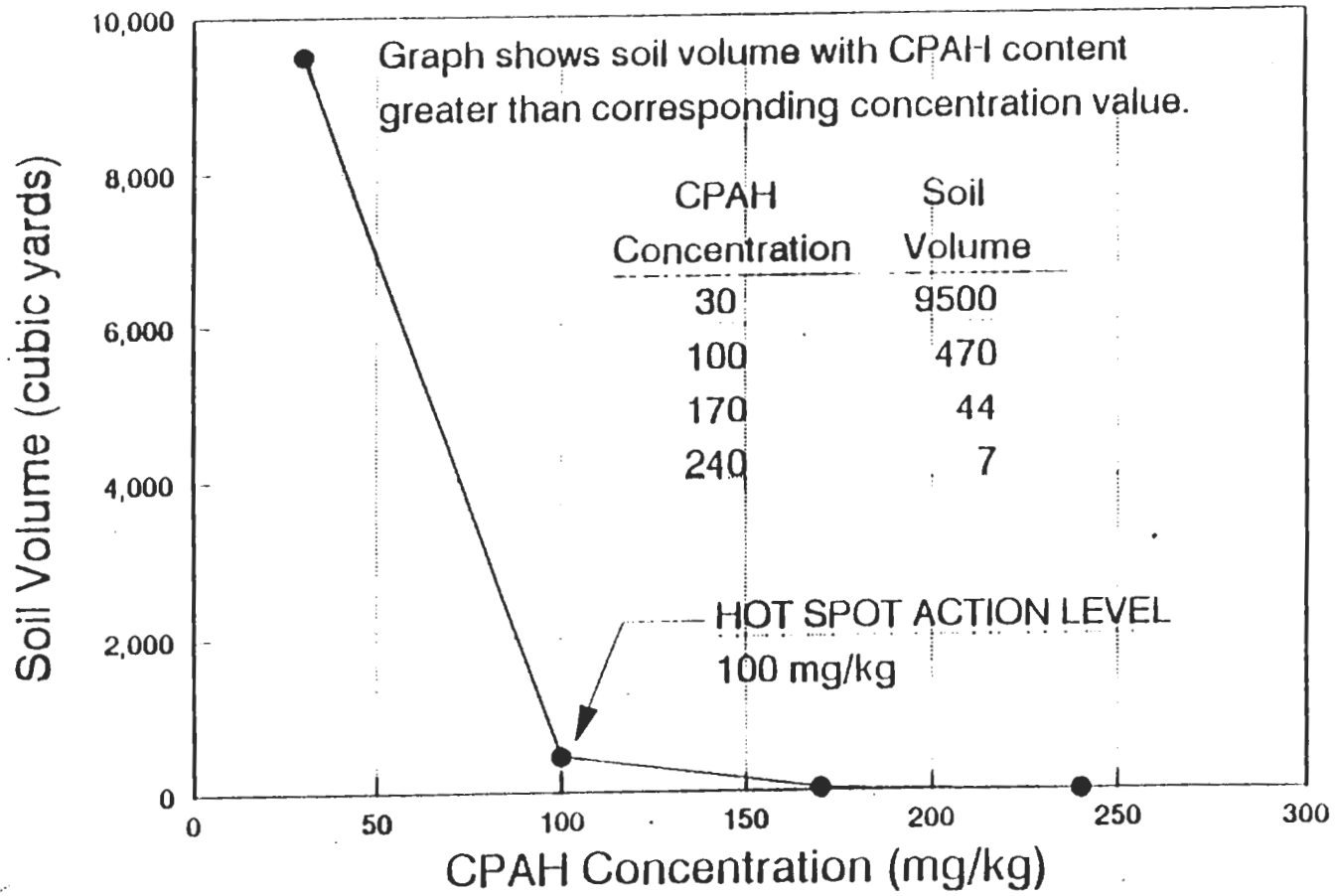


Figure 5.6 - CPAH Concentration vs. Soil Volume.

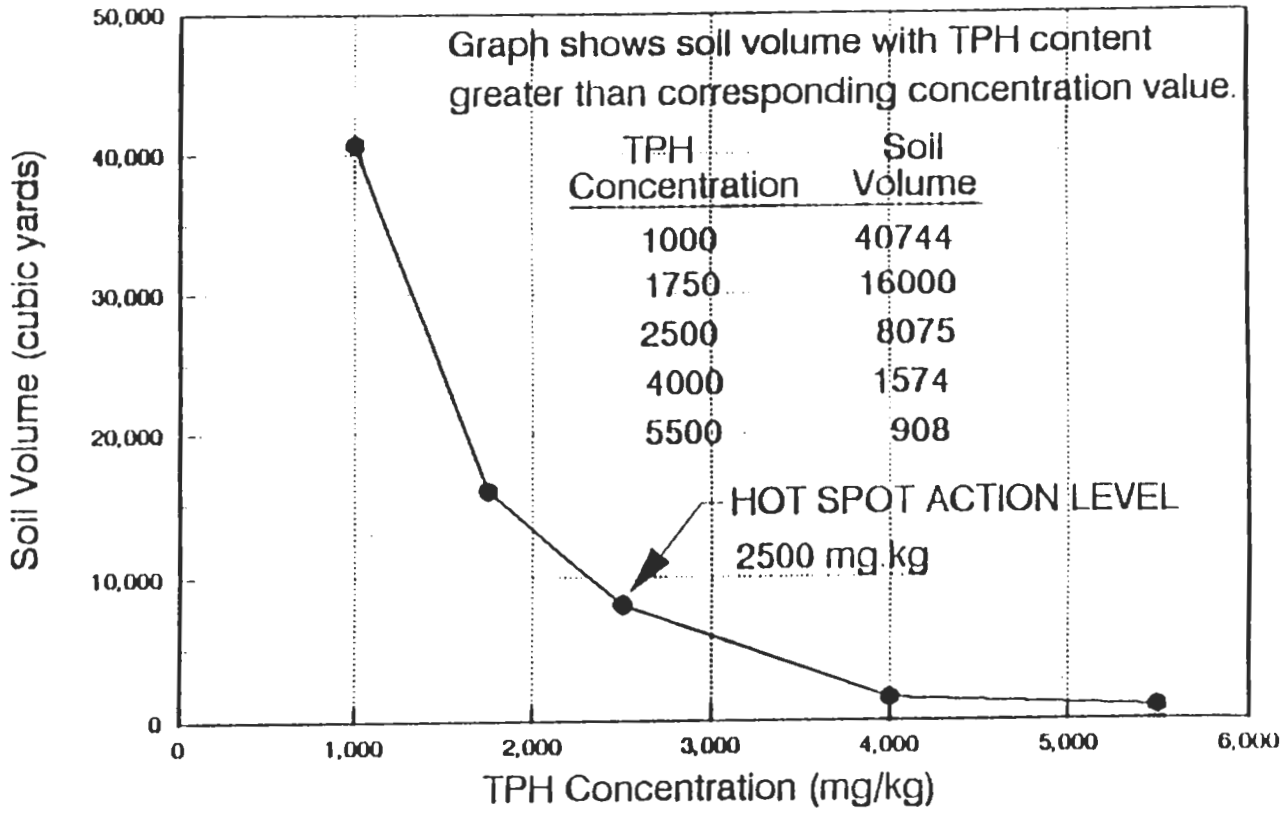


Figure 5.7 - TPH Concentration vs. Soil Volume.

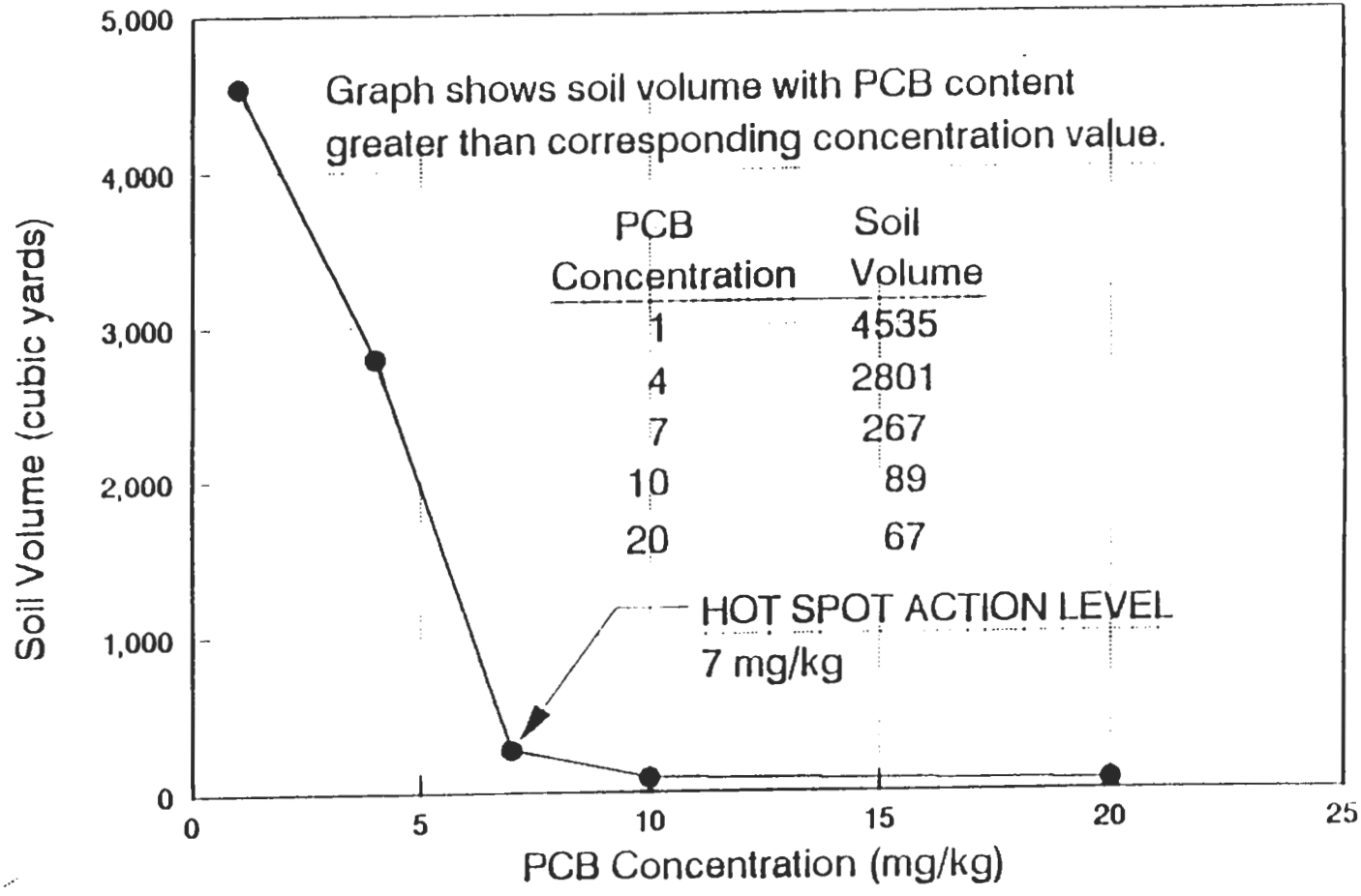


Figure 5.8 - PCB Concentration vs. Soil Volume.

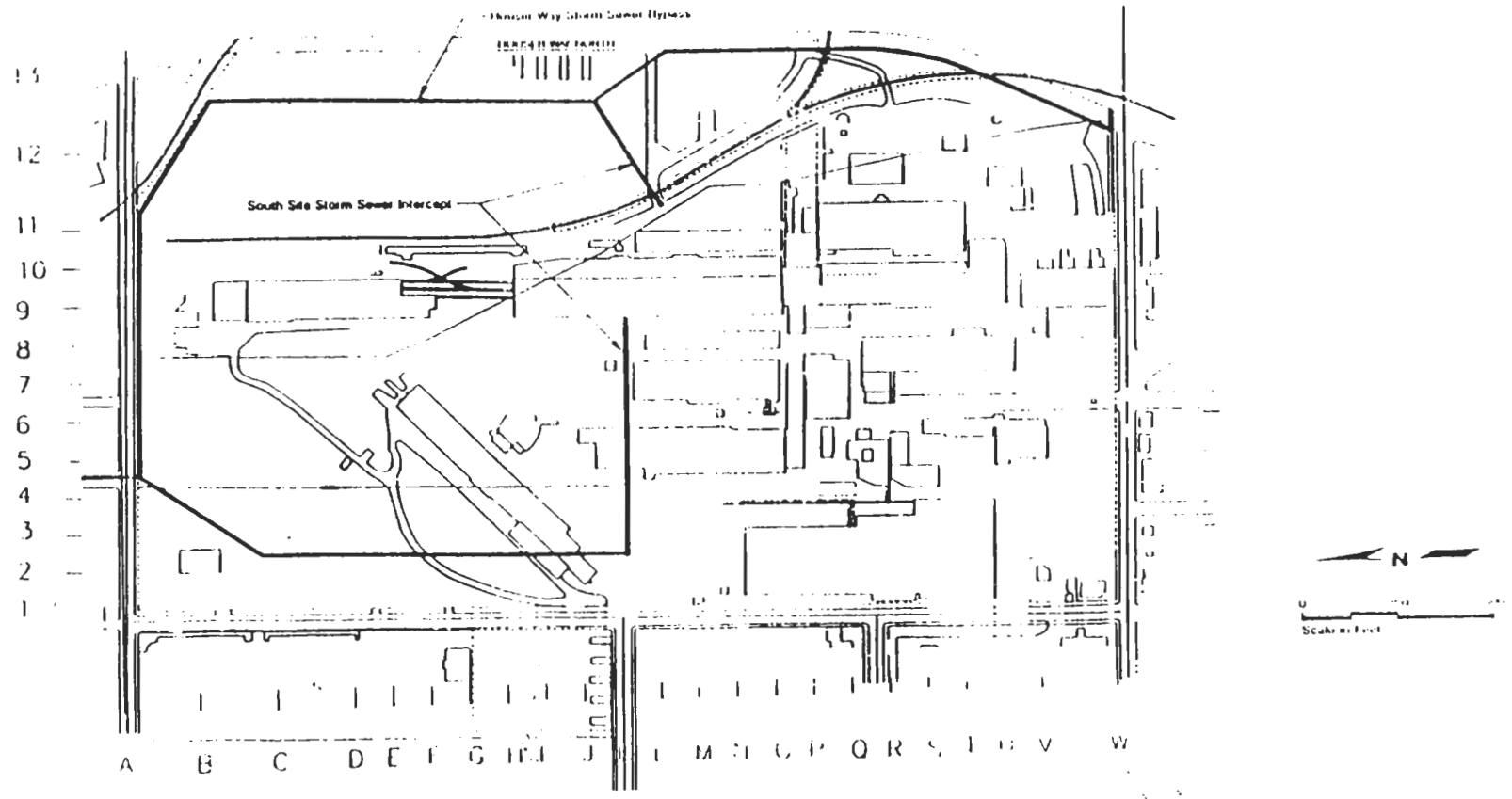


Figure 5.9 - Location of Proposed Stormwater System.

APPENDIX A

APPLICABLE OR RELEVANT AND APPROPRIATE REGULATIONS (ARAR's)

Table A-1
Chemical Specific ARAR's

Chemical	Requirements	Prerequisites	Citation	ARAR
Detected in ground water at Paccar Site: Arsenic Benzene Vinly Chloride 1,2 Dichloroethane Chromium VI Copper Lead Zinc	Maximum contaminant levels in community systems are set as follows: 0.050 mg/l 0.005 mg/l 0.002 mg/l 0.005 mg/l 0.050 mg/l 1.0 mg/l 0.050 mg/l 5.0 mg/l	Applicable to community drinking water systems, which are defined as public water systems that serve at least 15 service connections used by year-round residents or regularly serve at least 25 year-round residents.	Safe Drinking Water Act (SDWA), 40 CFR 141.	Relevant and Appropriate
Detected in surface water at PACCAR Site: Chromium Copper Lead Nickel Zinc	Ambient water quality criteria: 0.011 mg/l 0.007 mg/l 0.001 mg/l 0.088 mg/l 0.059 mg/l	Surface water used propagation of fish and aquatic life.	Clean Water Act (CWA), Section 303 and WAC 173-201.	Relevant and Appropriate
Detected in soil at PACCAR site.	Emission from soil of lead into air not to exceed 1.5 ug/m^3 based on quarterly average.	Major stationary source.	Clean Air Act (CAA), 40 CFR Part 50	Relevant and Appropriate

WAC 197-11-970 Determination of nonsignificance (DNS).

DETERMINATION OF NONSIGNIFICANCE

Description of proposal PACCAR Remedial Action, Renton, Washington. Cleanup and monitoring of former industrial site of approximately 82 acres in accordance with Chapter 70-105 RCW, "Model Toxics Control Act."

Proponent PACCAR Inc.

Location of proposal, including street address, if any 1400 North Fourth Street, Renton, WA

Lead agency Washington Department of Ecology

The lead agency for this proposal has determined that it does not have a probable significant adverse impact on the environment. An environmental impact statement (EIS) is not required under RCW 43.21C.030(2)(c). This decision was made after review of a completed environmental checklist and other information on file with the lead agency. This information is available to the public on request.

☐ There is no comment period for this DNS.

☒ This DNS is issued under 197-11-340(2); the lead agency will not act on this proposal for 15 days from the date below. Comments must be submitted by June 28, 1991.

Responsible official Michael Gallagher

Position/title Section Head, Toxics Cleanup Program, NWRO Phone 649-7054

Address Washington State Department of Ecology, 3190 - 160th Avenue SE, Bellevue, WA 98

Date June 13, 1991 Signature

NOTE: The Remedial Investigation Report, Feasibility Study Report, and Draft Cleanup Action Plan are available for review at Ecology's Northwest Regional Office and at the Renton Public Library.

For questions contact: David L. South, Ecology Site Manager
(206) 649-7200

ENVIRONMENTAL CHECKLIST

A. BACKGROUND

1. Name of proposed project, if applicable:

PACCAR Remedial Action, Renton, Washington

2. Name of applicant:

PACCAR Inc

3. Address and phone number of applicant and contact person:

Attn: Robert K. Butler
Corporate Environmental Manager
PACCAR Inc
P. O. Box 1518
Bellevue, Washington 98009

(206) 455-7435

4. Date checklist prepared:

May 13, 1991

5. Agency requesting checklist:

Washington State Department of Ecology

6. Proposed timing or schedule (including phasing, if applicable):

It is anticipated that remediation work in accordance with the Remedial Action Consent Decree will commence in late Summer 1991, after entry of the Consent Decree. The remediation work may be coordinated with work required for separate redevelopment proposals discussed in response to question 9 below.

Work to occur during 1991 may include the following: (1) grading, filling, utility excavation, soil stockpiling, backfilling, and paving in the northeastern corner of the site; (2) relocation of an existing drainage line under the site to the west edge of vacated Houser Way North; (3) on the south half of the site, interception of existing site drainage from south to north and redirecting site drainage from east to west; (4) excavation and offsite disposal of PCBs; (5) excavation and stockpiling of soils on the

southern 40 acres from "hot spots" located in the northern 40 acres of the site; (6) removal of existing paving and foundations in the northern 40 acres of the site; and (7) backfilling the northern 40 acres of the site.

Work to occur during 1991 and 1992 may include (8) treatment and placement onsite, or treatment and/or offsite disposal, of metals-contaminated soils where necessary.

Work to occur during 1992 may include the following: (9) excavation, stockpiling, and treatment and placement onsite or treatment and/or offsite disposal of soils from "hot spots" in the southern portion of the site; (10) removal of existing paving and foundations in the southern portion of the site; and (11) covering exposed areas with imported fill.

The duration of remaining remediation activity under the Consent Decree will depend upon the remedial action alternative which is selected by the Department of Ecology. During 1993 and 1994, treatment of contaminated soils may continue, with treated soils placed on-site or hauled offsite. Demolition of existing pavement and foundations on the south half of the site may continue. Exposed areas may be covered and filled. Longer term remediation may include groundwater monitoring and groundwater remediation, if necessary.

7. **Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain.**

None related to or connected with this proposal; see answer to question 9 below.

8. **List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal.**

Remedial Investigation and previous site studies listed therein (September 1, 1989)
Feasibility Study (February 23, 1990)
Draft Cleanup Action Plan
Design Engineering Report (to be drafted)
Cleanup Construction Plans and Specifications (to be drafted)

9. **Do you know whether applications are pending for governmental approvals of other proposals directly**

affecting the property covered by your proposal? If yes, explain.

Redevelopment of the site, after soils remediation, may occur under a separate proposal. PACCAR is considering and has a proposal pending before the City of Renton for development of a Kenworth Truck plant on the northern 40 acres of the site. A portion of the site, located in the northeast corner, will be developed as a parking lot to serve the PACCAR Parts Division office and warehouse buildings east of Houser Way North. These proposals are each fully independent of each other and of the proposed remedial action.

10. List any government approvals or permits that will be needed for your proposal, if known.

Approved Cleanup Action Plan and Consent Decree for remedial action (Department of Ecology)

For some remedial action alternatives, a utility permit for relocation of the existing drainage line and alteration of site drainage, a demolition permit, and a special permit for grading and filling, including an approved temporary erosion and sedimentation plan, may be required from the City of Renton.

For some remedial action alternatives, air contaminant source approval may be required from PSAPCA.

For some remedial action alternatives, an NPDES permit or METRO discharge permit may be required.

11. Give brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page.

Cleanup and monitoring of former industrial site consisting of approximately 82 acres in accordance with the Model Toxics Control Act.

12. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably

available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist.

1400 North 4th Street, Renton, Washington

See Remedial Investigation for legal description, site plan, and vicinity map.

B. ENVIRONMENTAL ELEMENTS

1. Earth

a. General description of the site:

Flat

b. What is the steepest slope on the site (approximate percent slope)?

N/A

c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any prime farmland.

Gravel, sand, clay, peat, and fill

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe.

No

e. Describe the purpose, type, and approximate quantities of any filling or grading proposed. Indicate source of fill.

Attachment 1 shows approximate quantities, based on the Draft Cleanup Action Plan, of soils excavated for remediation, as well as for utility trenches for the relocated drainage line and redirected site drainage. After remediation, remediated soils will be placed onsite or hauled offsite. Attachment 1 shows approximate quantities to be hauled offsite.

Attachment 1 also shows approximate quantities of clean fill to be used to backfill excavated areas,

cover exposed areas; and fill the site to final subgrade. This fill will be either clean imported fill or materials from onsite that have been treated and remediated. Imported fill will be primarily natural materials and may include some crushed concrete. The source of the imported fill is not known at this time. Some crushed concrete from the site may be used.

f. **Could erosion occur as a result of clearing, construction, or use? If so, generally describe.**

Yes, but to a minimum degree because the site is flat and a City of Renton approved temporary erosion and sedimentation plan will be implemented during grading and excavation.

g. **About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)?**

Remediation will not require the creation of any new impervious surfaces. Existing buildings and parking lots remaining after remediation, together with the PACCAR Parts Division parking lot in the northeast corner of the site, will represent approximately 17.9% of the site. If the proposed Kenworth Truck Plant is constructed on the north half of the site, approximately 37.8% of the site will be covered with impervious surfaces.

h. **Proposed measures to reduce or control erosion, or other impacts to the earth, if any:**

See answer to B.1.f.

2. **Air**

a. **What types of emissions to the air would result from the proposal (i.e., dust, automobile, odors, industrial wood smoke) during construction and when the project is completed? If any, generally describe and give approximate quantities if known.**

Dust may be generated during excavation but amounts will be minimized by standard construction practices and in compliance with the Health and Safety Plan and the Cleanup Action Plan. Under some remedial action alternatives, there may be vehicle emissions from excavation equipment and trucks used for hauling. Air

monitoring will occur during construction in compliance with the Health and Safety Plan and Cleanup Action Plan.

b. **Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe.**

None known

c. **Proposed measures to reduce or control emissions or other impacts to air, if any:**

Minimize off-site transport of soil
Sprinkle or water down site during excavation
Wash down trucks before leaving site
Restraining equipment on trucks hauling soil off-site
Air pollution control equipment
Clean blanket of sand over remediated areas

3. **Water**

a. **Surface:**

1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into.

There is no surface water body on the site or in the immediate vicinity. The site is near Lake Washington, the Cedar River, and Johns Creek (which flows into Lake Washington). Runoff from the site flows into Johns Creek and the Cedar River.

2) Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans.

No

3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material.

None

4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known.

No

5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan.

No.

6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.

No.

b. Ground:

1) Will ground water be withdrawn, or will water be discharged to ground water? Give general description, purpose, and approximate quantities if known.

Groundwater will be monitored as part of the proposal. Under some remedial action alternatives, an unknown quantity of groundwater may be pumped, analyzed, treated (if required), and discharged to the METRO sewer system.

2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals . . .: agricultural, etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.

None

c. Water Runoff (including storm water):

1) Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe.

Most site storm water is presently collected in three drainage lines and discharged to the City's storm sewer system in North 8th Street north of the site. An existing City drainage line, conveying runoff from uphill properties across the site, may be relocated to the west edge of Houser Way North, but would continue to discharge into the City system at North 8th Street. Existing site drainage, which flows from south to north, may be intercepted and redirected east to west before it reaches the northern half of the site. A small area of the site (less than ten percent) currently drains to the Cedar River.

Storm water runoff volumes are not expected to increase under most remedial action alternatives. During remedial activity, storm water which contacts excavated soils will be collected, analyzed, treated (if necessary), and discharged to METRO.

2) Could waste materials enter ground or surface waters? If so, generally describe.

The purpose of the proposal is to remove contamination from soils and groundwater in order to minimize the possibility of waste materials entering surface or ground waters. It would be possible for surface water runoff to become contaminated through contact with contaminated soils, but this will be controlled through measures adopted as part of the Cleanup Action Plan.

d. Proposed measures to reduce or control surface, ground, and runoff water impacts, if any:

These measures, which will be included in the Design Engineering Report, could include testing, sedimentation ponds, and berms.

4. Plants

a. Check or circle types of vegetation found on the site:

_x_ deciduous tree: alder

_x_ evergreen tree: (limited landscaping)

_x_ shrubs (limited landscaping)

_x_ grass (limited landscaping)

___ pasture

___ crop or grain

_x_ wet soil plants: cattail (in drainage ditches)

___ water plants: water lily, eelgrass, milfoil, other

___ other types of vegetation

The site is a former industrial site. Small numbers of plants are found in the areas in which remedial action work will occur.

b. **What kind and amount of vegetation will be removed or altered?**

Small amounts of existing small trees and weeds.

c. **List threatened or endangered species known to be on or near the site.**

None

d. **Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any:**

No landscaping is proposed during this remediation project. After soils remediation is completed, appropriate landscaping will be installed, in conjunction with the proposed Kenworth Truck Plant or as a temporary cover pending other redevelopment of the site.

5. **Animals**

a. **Circle any birds and animals which have been observed on or near the site or are known to be on or near the site:**

birds: hawk, heron, eagle, songbirds, other:

pigeons, geese, ducks, quail

mammals: deer, bear, elk, beaver, other:

muskrat, rabbit

fish: bass, salmon, trout, herring, shellfish, other:

none

b. **List any threatened or endangered species known to be on or near the site.**

None known

c. **Is the site part of a migration route? If so, explain.**

Unknown. It is believed unlikely that the site is part of a migration route.

d. **Proposed measures to preserve or enhance wildlife, if any:**

None

6. **Energy and Natural Resources**

a. **What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc.**

Since the project is remediation of a contaminated site, there will be no energy needs associated with the completed project. Energy needs of the remedial action work may be met by gasoline or diesel fuels (for construction vehicles) and electricity (for ventilation and pumping which may occur under some remedial action alternatives).

b. **Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe.**

No

c. **What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any:**

Energy-efficient construction equipment will be used where possible.

7. Environmental Health

a. **Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal? If so, describe.**

The purpose of the proposed action is to reduce or eliminate the risk of environmental health hazards associated with site contamination. Under some remedial action alternatives, off-site transport of contaminated soil could result in such exposures if done without proper safeguards. During the course of remedial action work, workers on site could also be exposed to toxic chemicals or hazardous waste, if work is done without proper safeguards. These potential exposures would be limited by measures to be implemented under the Cleanup Action Plan.

1) Describe special emergency services that might be required.

Emergency medical services might be required in the event of a construction accident.

2) Proposed measures to reduce or control environmental health hazards, if any:

All work will be done in accordance with the approved Feasibility Study and/or Cleanup Action Plan, including a specific health and safety plan. Any off-site transport of contaminated soils would be done in accordance with state and federal regulations.

b. **Noise**

1) What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)?

Does not apply.

2) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from the site.

Under some remedial action alternatives, noise from operation of construction equipment and truck traffic

could occur. Noise associated with these activities would occur between 7:00 a.m. and 10:00 p.m.

3) **Proposed measures to reduce or control noise impacts, if any:**

Limit hours of construction activity and hauling, if any. Haul routes will not use local streets in residential areas.

8. **Land and Shoreline Use**

a. **What is the current use of the site and adjacent properties?**

The site is currently vacant, except for a Kenworth Truck research and development facility at the northwest corner of the site (Building 51), an office building in the southern portion of the site (Building 1A), the former foundry building (Building 17), and a parking lot in the eastern portion of the site adjacent to Houser Way. Adjacent properties include office, residential, and industrial uses as well as parking.

b. **Has the site been used for agriculture? If so, describe.**

Not since the 1940's.

c. **Describe any structures on the site.**

Kenworth Research and Development facility located near Garden Avenue North and North 8th Street; former foundry building located adjacent to Garden Avenue North; PACCAR office building located near North 4th Street

d. **Will any structures be demolished? If so, what?**

Not as part of this project. Several structures which formerly occupied the site were demolished pursuant to a demolition permit issued by the City of Renton in 1988. Remedial action work may include demolition and removal of some existing paving and foundations remaining on the site.

e. **What is the current zoning classification of the site?**

Heavy Industrial (H-1)

f. **What is the current comprehensive plan designation of the site?**

Heavy Industrial

g. **If applicable, what is the current shoreline master program designation of the site?**

Not applicable

h. **Has any part of the site been classified as an "environmentally sensitive" area? If so, specify.**

No

i. **Approximately how many people would reside or work in the completed project?**

The completed remediation project will not result in any additional employees on-site. It is expected that current employees working in the office, research and development facility, and security guard posts will remain.

j. **Approximately how many people would the completed project displace?**

None

k. **Proposed measures to avoid or reduce displacement impacts, if any:**

None necessary

l. **Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any:**

None necessary

9. Housing

a. **Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing.**

None

b. **Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing.**

None

c. **Proposed measures to reduce or control housing impacts, if any:**

None

10. **Aesthetics**

a. **What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed?**

No structures are proposed.

b. **What views in the immediate vicinity would be altered or obstructed?**

Remediation activity on the site will not alter or obstruct views of natural features or surrounding development. Partial views of the site itself from I-405 and the hillsides to the east may be altered slightly, under some remedial action alternatives, to include views of temporary excavation pits and temporary soil piles on this former industrial site.

c. **Proposed measures to reduce or control aesthetic impacts, if any:**

None during remediation activity; upon completion of project, site redevelopment and/or landscaping may occur.

11. **Light and Glare**

a. **What type of light or glare will the proposal produce? What time of day would it mainly occur?**

None, except for headlights of vehicles during on-site and off-site hauling activity and temporary construction lights required by OSHA.

b. **Could light or glare from the finished project be a safety hazard or interfere with views?**

No

c. **What existing off-site sources of light or glare may affect your proposal?**

None known

d. **Proposed measures to reduce or control light or glare impacts, if any:**

None

12. Recreation

a. **What designated and informal recreation opportunities are in the immediate vicinity?**

None. The site is near Coulon Park and Lake Washington.

b. **Would the proposed project displace any existing recreational uses? If so, describe.**

No

c. **Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any:**

None. The project is designed to improve the quality of storm water runoff to nearby parks.

13. Historic and Cultural Preservation

a. **Are there any places or objects listed on, or proposed for, national, state, or local preservation registers known to be on or next to the site? If so, generally describe.**

No

b. **Generally describe any landmarks or evidence of historic, archaeological, scientific, or cultural importance known to be on or next to the site.**

None

c. **Proposed measures to reduce or control impacts, if any:**

None

14. Transportation

a. **Identify public streets and highways serving the site, and describe proposed access to the existing street system. Show on site plans, if any.**

The site is bounded by North 8th Street, Garden Avenue North, North 4th Street, and vacated Houser Way. Access will be either through the west gate at Garden Avenue North and North 6th Street, or at North 8th Street. Truck routes will be limited to arterial streets located north of North 4th Street: Garden Avenue, Houser Way, North Park Drive, North 8th Street, and I-405.

b. **Is site currently served by public transit? If not, what is the approximate distance to the nearest transit stop?**

The nearest bus stop is one block away.

c. **How many parking spaces would the completed project have? How many would the project eliminate?**

None

d. **Will the proposal require any new roads or streets, or improvements to existing roads or streets, not including driveways? If so, generally describe (indicate whether public or private).**

No

e. **Will the project use (or occur in the immediate vicinity of water, rail, or air transportation? If so, generally describe.**

No

f. **How many vehicular trips per day would be generated by the completed project? If known, indicate when peak volumes would occur.**

The completed project would not generate any vehicular trips. During the cleanup period, most contaminated soils are to be remediated and placed on-site. Attachment 1 shows anticipated volumes of truck traffic and estimated timing for various work under

some remedial action alternatives. Peak volumes are expected to occur between 8:30 a.m. and 3:00 p.m.

g. **Proposed measures to reduce or control transportation impacts, if any:**

Minimize off-site hauling
Limit haul routes
Limit hours of hauling

15. **Public Services**

a. **Would the project result in an increased need for public services (for example: fire protection, police protection, health care, schools, other)? If so, generally describe.**

The project would involve oversight by Department of Ecology personnel. Other public services would be unaffected.

b. **Proposed measures to reduce or control direct impacts on public services, if any.**

None

16. **Utilities**

a. **Circle utilities currently available at the site:**

electricity	yes
natural gas	yes
water	yes
refuse service	yes
telephone	yes
sanitary sewer	yes
septic system	no
other	storm drain system

b. **Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed.**

No new utilities are proposed for the project. An existing storm drain may be relocated from the center of the site to the west edge of Houser Way North. Existing south-north site drainage may be intercepted and redirected to flow from east to west. This work

would involve utility excavation, stockpiling, and backfilling.

C. **SIGNATURE**

The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

Signature: R. K Butler

Date Submitted: May 13, 1991

ATTACHMENT 1

Environmental Checklist
Draft CAP Imported/Exported Soils Volumes

Month	Activity	Import*	Export*	Truck Loads	Daily Trip Ends**
7/91	Interceptor drain	5,000	1,000	333	
	Houser drain	10,000	1,000	611	79
8/91	PCB remediation	1,000		55	5
9/91	PCB remediation		1,000	56	
	North end hot spots	7,500	0	417	40
10/91	North end hot spots	7,500	1,500	500	
	North end demolition	0	2,000	111	40
11/91	North end hot spots	0	1,500	83	
	North end demolition	0	2,000	111	
	North end backfill	28,350	0	1575	150
12/91	North end backfill	28,350	0	1575	150
1/92	North end backfill	13,900	0	772	74
2/92	North end backfill	13,900	0	772	74
3/92	North end backfill	19,450	0	1081	103
4/92	North end backfill	19,450	0	1081	103
5/92	North end backfill	12,500	0	695	66
6/92	North end backfill	12,500	0	695	
	South end demolition	0	833	46	
	South end backfill	8,333	0	463	110
7/92	North end backfill	13,750	0	764	
	South end demolition	0	833	46	
	South end hot spots	2,500	500	167	
	South end backfill	8,333	0	463	130
8/92	North end backfill	13,750	0	764	
	South end demolition	0	833	46	
	South end hot spots	2,500	500	167	
	South end backfill	8,333	0	463	130

Month	Activity	Import*	Export*	Truck Loads	Daily Trip Ends**
9/92	South end demolition	0	833	46	
	South end hot spots	2,500	500	167	
	South end backfill	8,333	0	463	57
10/92	South end demolition	0	833	46	
	South end hot spots	2,500	500	167	13
11/92	South end demolition	0	833	46	
	South end hot spots	2,500	500	167	13
12/92	South end demolition	0	833	46	
	South end hot spots	2,500	500	167	13
1/93	South end demolition	0	833	46	4
2/93	South end demolition	0	833	46	4
3/93	South end demolition	0	833	46	4
4/93	South end demolition	0	833	46	4
5/93	South end demolition	0	833	46	4
6/93	South end backfill	8,333	0	463	44
7/93	South end backfill	8,333	0	463	44
8/93	South end backfill	8,333	0	463	44
9/93	South end backfill	8,333	0	463	44
6/94	South end backfill	8,333	0	463	44
7/94	South end backfill	8,333	0	463	44
8/94	South end backfill	8,333	0	463	44
9/94	South end backfill	8,333	0	463	44

* Cubic yards

** Average for month, assuming combination of import/export trips and 21 workdays per month

331145

APPENDIX C

RESPONSIVENESS SUMMARY

Table A-2
Action Specific ARAR's

Action	Requirements	Prerequisites	Citation	ARAR
Excavation and Treatment	Workers involved in activities with the potential for soil contact will have completed health and safety training	Work on NPL Site	29 CFR 1910.120, WAC 296-62 Part P	Applicable
	Prepare and use a fugitive emission control plan	Work which will disturb soils	CAA Section 101 and 40 CFR 52	Applicable
Off-Site Transport and Disposal of Soil	Soil will be transported in a manner consistent with applicable regulations	Waste from an NPL Site	49 CFR Parts 107, 171, and 172	Applicable
	Soil to be disposed of at a permitted landfill	Waste from an NPL Site	SARA Section 121	Applicable
Monitoring	Wells will be installed using a licensed drilling contractor according to Washington State standards	Installing wells in Washington State	WAC 173-160 WAC 173-162	Applicable

APPENDIX B

SEPA DOCUMENTS

Ecology appreciates the comments received during the public hearing and in writing. Some individuals had the same or similar comments. Ecology has read the transcript from the public hearing and the letters received and believes the comments can be addressed by discussing eleven questions. The questions were developed from the transcript of formal comments received during the hearing and from the written comments. Many of the written comments were substantially the same as contained in the comments received during the hearing. A transcript of the comments received during the public hearing, and copies of the written comments received during the comment period, follow the questions and Ecology's responses. The questions, with Ecology's responses, are:

1. **Is the consent decree available for public review prior to entry with the court?**

   The consent decree was made available for public review during the public comment period, June 17 to July 16, 1991. Copies were, and are, available at the Renton Public Library and Ecology's Northwest Regional Office.

2. **What consideration is being given to concerns about contamination in gardens of residents living south of the site?**

   In 1989 Ecology and the Washington State Department of Health (DOH) met with residents living south of the site to discuss health concerns. At this time DOH offered to conduct a health survey in the area, but needed responses from the residents to a health questionnaire in order to initiate the survey. An insufficient number of health questionnaire responses were received from the residents to enable DOH to initiate the survey.

3. **Was the ditch along the west side of the property investigated?**

   During public comment, the presence of a former ditch running along Garden Avenue between Fourth and Eighth Streets was mentioned. The former ditch, since filled in, was reported to have contained " ... yellow-orange, scummy, smelly ... material".

   If this location is off-site, it was not investigated during the Remedial Investigation, which was conducted

on-site. The Cleanup Action Plan has been modified to require PACCAR to investigate this ditch. The first step will be to ascertain the location of the ditch with respect to existing sampling stations.

4. **What is the possibility of contamination migrating off site from soil treatment areas on the south half of the site?**

   Soil treatment will be conducted on areas lined with concrete or impervious plastic to prevent migration of contaminants downward into the soil or to the ground water. Soil placed in the treatment areas will be covered with plastic to prevent generation of dust. Both air and ground water monitoring will be conducted to check that these mitigation measures control off-migration. A 325-ft buffer zone will be established between the south property boundary and the area of the site used for treatment.

5. **What consideration will be given to aesthetics for the neighborhood to the south of the site and for people passing the site?**

   PACCAR will place temporary screening along the south boundary of the site. More permanent aesthetic considerations are being discussed by PACCAR and the City of Renton in connection with other PACCAR projects and are beyond the scope of the cleanup action and the authority of the Model Toxics Control Act.

6. **What is the impact of leaving contamination contained on site and why was this cleanup action chosen for soils with low levels of contamination?**

   The Model Toxics Control Act Regulation, Chapter 173-340 WAC, requires that all cleanup actions mitigate risks to the levels specified in the regulation. Hence, human health and the environment at the must be protected to the required levels regardless of the cleanup actions chosen. The primary impact of leaving contamination on site will be that long term management of the site will be required in the form of institutional controls and comfirmational monitoring. Covenants will be placed in the property deed to ensure that the site remains industrial, appropriate health and safety meausres remain

in effect, the cover is maintained, and surface water and ground water monitoring continues.

This cleanup action was chosen as a balance between long-term and short-term impacts. As discussed by Ecology, in "Final Environmental Impact Statement, Cleanup Standards", January 1991:

> "The correction of contamination problems at hazardous waste sites may result in some unavoidable adverse impacts. Ecology will generally be faced with balancing the short-term adverse impacts associated with the actual cleanup action (incineration, biotreatment, etc.) and the long-term impacts associated with residual levels of hazardous substances. The proposed amendments are structured in a manner that facilitates site-specific decision which minimize overall adverse impacts."

Further,

> "In general, regulatory requirements which result in more stringent cleanup levels and greater use of treatment technologies will increase the potential for adverse health effects among on-site workers."

Ecology believes the short-term risks to human health and the environment which would result from excavation, transport, and treatment of large volumes of soils containing relatively low levels of contamination outweight the long-term risks of containing the soil in place. This is clearly in line with the Ecology's recognition of (WAC 173-340-360(9)(c):

> " ... the need to use engineering controls, such as containment, for sites or portions of sites that contain large volumes of materials with relatively low levels of hazardous substances where treatment is impracticable."

7. What political process was involved in setting cleanup levels and hot-spot action levels?

The political process involved in setting cleanup levels was the process by which regulations are adopted, rather

than a process involving the PACCAR site, per se, or any negotiations between PACCAR and Ecology.

The process is characterized as the rulemaking process which was followed in developing the Model Toxics Control Act Regulation (Chapter 173-340-WAC. Cleanup levels and methods for selecting cleanup actions were set in a comprehensive rule-making process following the Administrative Procedures Act.

8. **What consideration was given to the unique situation of the aquifer in relation to the site?**

This question referred to the position of the City of Renton's well field in the aquifer beneath the site. Although referred to as a unique situation, having a drinking water supply well field in a shallow aquifer beneath urban and industrialized areas is a situation shared by other communities. In point of fact, Ecology is frequently concerned with protection of drinking water supplies in shallow aquifers underlying urban and industrial area.

In such cases, including the PACCAR site in Renton, the specific situation is considered on a case-by-case basis, considering the particulars of the hydrostratigraphy and the nature and distribution of contamination. Sufficient measures are taken to protect each aquifer according to considerations and methods prescribed by Chapter 173-340 WAC. The regulation does not provide that some aquifers are less protected and some are more protected based upon their location and nature. All are protected to the level necessary to preserve present and future drinking water supplies.

This is similar to the mandate in the Model Toxics Control Act that, "Each person has a fundamental and inalienable right to a healthful environment ... ". There was some discussion in the public hearing as to whether more stringent protective measures would be taken at this site since it is in an urban area. Ecology's mandate is to protect all individuals, whether living in rural or urban areas, and to consider the specifics of each site in order to do this. All individuals (and aquifers) must be protected to the full extent of the law. Protection may not be lowered because individuals live in a rural area, or because an aquifer is in a

remote area. The actions necessary to achieve that protection will generally vary, but Ecology will strive to achieve consistent levels of protection throughout the state.

9. What process must a property owner go through in order to excavate in areas of low-level contamination contained on site?

Restrictive covenants placed in the property deed will ensure that property owners are aware that low-level contamination is contained on site, and that any excavation must be done under a health and safety plan suitable for hazardous waste operations. Details on the requirements of such plan may be obtained from the Washington State Department of Labor and Industries.

Further, testing will be required to ascertain levels of contamination and provisions must be made for handling contaminated soil according the the requirements of the Cleanup Action Plan.

10. What will be done to make sure that trucks with contaminated soil do not create traffic problems or allow contaminated soil to reach the residential area to the south of the site?

Truck traffic will be controlled by limiting the hours of trucking operations and specifying trucking routes. Trucks will be routed to the north of the site and will not pass through the residential area. The specifics of these considerations are addressed in the following permits

- PACCAR Parts Parking Lot Permit
- Utility (Storm Drain) Permits
- Demolition Permit
- Grade and Fill Permit

All trucks entering hazardous waste exclusion zones will be decontaminated prior to leaving the zone. Transportation of any hazardous materials will be done in full accordance with Department of Transportation regulations. All hazardous wastes, hazardous materials,

and contaminated soil leaving the site are to be covered or contained in drums or tanks.

11. **Contaminated soil will be treated on the south half of the site. Is Ecology aware that residents are living across the street from the south half of the site?**

Ecology has been fully aware that there is a residential area to the south of the site, and has considered this in preparing the Cleanup Action Plan. Ecology personnel have met with residents at the residence of Warren and Versie Vaupel. and have driven through the residential area numerous times when visiting the site. As noted in Section 3.6.4 of this Cleanup Action Plan, "Since the PACCAR site has a residential area to the south and has commercial, rather than industrial properties, on other boundaries, it cannot be considered an industrial site [for the purposes of WAC 173-340-745]."

Note that all stockpiling and treating of contaminated soil will occur north of the Aquifer Protection Area and at least 325 feet north of North Fourth Street. Dust control measures will be implemented. Air quality will be monitored to ensure that the dust controls measures are working as anticipated and allow rapid corrective action if necessary.

TRANSCRIPT OF FORMAL COMMENTS
RECEIVED AT PUBLIC HEARING

Versie Vaupel
PO Box 755
Renton, WA 98057

I have sort of a grab bag of questions or short comments. The first thing I would like to say is that I am glad to see that DOE [the Department of Ecology] is here and is willing to listen to people. I would say that some of us did not have such a good impression of DOE when we first started out on this. There was a group of somewhere between nine and twelve people who were meeting at my house from time to time at the beginning of this. One of the first questions that we asked was that could we be privy to the consent decree [governing the RI/FS], and we were not privy to the consent decree prior to its being entered. In fact, we had asked that we have a copy of the consent decree before you went into court to have it done. We had hired a consultant, and the consultant had been calling over there to the Redmond office and I do not think any of you are involved in this so don't think that I'm putting you down. But, anyway the consultant found out one day suddenly that the consent decree had already been issued, so I don't know what public participation meant at that stage of the game.

I would say that PACCAR, though, has been very helpful, and has given us information and has met with us from time to time, and we appreciate that. In fact, we have had a much more cordial relationship with PACCAR then with DOE. I hate to say that. But, anyway perhaps we can see the next consent decree prior to being entered.

We had meetings at our house, two of them with DOE. The first one was with the two inspectors and the second one was when the two inspectors set up a meeting with, I think, an epidemiologist and some medical scientists type people. Because there was great concern expressed at the first meeting about the contaminants that may have landed in our gardens, which we had been eating out of over the years. Afterwards there didn't seem to be a lot of momentum going to get that looked into to see whether the DOE would test it because there were some assignments that we would have to put together. Then there was also, what this gentlemen over here was talking about, land values - many people up there are middle class or lower employed people and it is a

moderate income group there, and they were afraid of losing the values of there homes so they did not pursue the possibility of testing off-site, into their gardens.

Also at the meeting there was several older people, I haven't lived here as long as others had, but there were several older women who talked about the dust that was coming into thier houses and that they had to dust more than three or four times a day, and they couldn't keep the windows open sometimes in the summer because of the black dirt on their window sills and that sort of thing.

Then, also, it was brought up that fact that from Fourth to Eighth on Garden, along the side there where now there is planted in most of the area some green pine trees and that sort of thing, they were asking what happened to the ditch and did anybody ever look into that ditch along side there which would be on public property. Evidently there had been runoff from the factory and they assumed from the factory that it was yellow-orange scummy smelly type of material in that ditch. Now as I say that was mentioned way up front along time ago.

Also I was interested to note the south half is the cleanup area where you are going to dump the material to be cleaned and remediated, if I understood right, and as much as that is the portion that's directly across the street from those residential houses. I've lived for several years two blocks from that area from that street on 2nd and I still live on 2nd but a little different area so it makes me equivalent of about 2 blocks and 1/2. I do know that the people down there make their gardens and eat out of them. So there is concern about the possibility of anything migrating off the site by water or by air that would have followed into their gardens.

In the cleanup site the area on the southern portion, if that's were its going to happen, I would hope that you would give some consideration to aesthetics and people - that is a major through way through Renton - and not only aesthetics for the neighborhood, but also for the people passing through.

One thing that was bothersome to me about the talk that was presented - I think I am a little more nervous about the site than I was before I came here when I saw the remediation can only reduce the contamination by anywhere

from 25 to 72% - the 72% being, I think if I got that right, was the 72% was getting rid of the PCBs that was the higher one. And so it frightens me just a little to think we can't do better than 25 or 50% better.

The last thing I think I want to comment at this time is I would startled to see that only $57,000 is only been spent by DOE, if I understood that right, since 1988.

[Yes. All investigations have been paid for by PACCAR. - David L. South]

My point is that DOE has been reimbursed only $57,000 so far. It seems to me that at least two people on the site part of the time and one person considerable amount of time it seems like the payment of the salaries would have eaten up that much more, that is one thing that is bothersome to me.

Kay Johnson

Decline to comment

Robert Stidum
30,300 110th Place, SE
Auburn, WA

I did not intend to comment I got most of my questions answered but I would like to put something on the record. I work in environmental issues and I see all of the horror stories out there, all of them. In this case here I think I want to say that I believe that it is done proper. Number 1 is that it is probably from the cleanup standpoint it probably is going as well as can be expected maybe even better in some areas. If not, I think it can be corrected.

The main thing is that I'm glad to see the money spent towards the purpose intended. And that means instead of going to attorneys, now I don;t have anything against attorneys but when you take $100 million project and they wind up with 1/3 for this side and 1/3 for that side it does not take a rocket scientist to know there's about $30

million left to clean a project up. That is absolutely asinine and stupid in this day in life. Where is the rest of the money going to come from if it costs $100 million to clean it up?

So I think, I have to commend the way this project is run. There are some others around that are starting to see the light of day, that we clean up projects instead of making the retirement plan for the attorneys.

Darrell Inglemund
3602 Lake WA Blvd N
Renton, Washington

I also appreciate the DOE's involvement, and I appreciate PACCAR's desire to continue using their site, and the efforts they are going through to make that site hopefully suitable for further industrial use. I listened closely tonight, and I think I learned something. I think it is very difficult, however, for a citizen to comment on things this technical. But I do have some concerns.

In particular it struck me as unique the location of Renton's Aquifer in relation to at one time, maybe still is, what is tagged as a Superfund site and my first concern focuses on that point. I thought Mr. South did an excellent presentation tonight and from what I could gather from it, that it was a political process that determined what had to go on for site cleanup and certain levels were established where it was deemed appropriate I suppose under certain levels of something nothing would happen, and above those levels other things would happened and above those levels more serious other things would happen and I as well as the next person can understand the trade off between cost and risk.

But from what I can gather tonight, the process that established the trade off between cost and risk probably did not look at the unique situation that the aquifers in relation to the site. And I would like some further focus on that topic. And I would like DOE to explain how closely they feel that the agreed upon actions take into account Renton's unique situation with the aquifer and the site. And I would like to see that tackled looking at arsenic, benzene, chromium, and all the other items that you folks

normally look at to see how that compares to what you have already done.

My second area of concern is the future excavation for changes that might occur at this site after the spot light goes away. And this is not to say that PACCAR or whoever the future owners of this site might be will not attempt to adhere to all of the things that were discovered during this process, but sometimes it is extremely difficult to understand things that occurred five or ten years back so I would like to have DOE explain the process that a property owner would have to go through to do some digging for making modifications in these areas that will not be considered clean. The areas that will be somehow, if I understood correctly, cordoned off from use until some future time. And I would like to understand what that process would be that the owner would have to go through to do something in those areas.

As a citizen somewhat familiar with the bureaucratic process, I would much prefer if the owner of the property had to come to the state who we would presume would be the most knowledgeable in these matters, and ask for a permit to make modifications in that area. This is not to say that the city would not do a good job, but in many instances cities do not have the kind of expertise that exists in the state level. So I would like to see permit process exist where they had to come to the state and get the permit to make sure that they were doing all the necessary things and possibly even further cleanup etc.

Those are my two concerns, thank you.

Mathew M. Getz

Not here

Versie Vaupel

Trucks driving through the neighborhood. PACCAR has promised in their expansion that they will not use the residential streets to the south or to the west in any haul off or carrying away of their trucks that they will be driving away. We appreciate that and we have had good cooperation and that arena.

So I would like to for the record to make sure that there would be some monitoring on the truck drive away of the contaminated soil from working over there to make sure that there are no trucks, delivery, or other vehicles that might have contaminated soil on them, in them, or around them so that they will not be tracked into the neighborhood. Thank you.

WRITTEN COMMENTS

July 11, 1991

Department of Ecology
3190 180th Ave SE
Bellevue WA 98004

Attn: David South and Judy Fisher

Re : PACCAR cleanup

To whom it may concern:

My husband was in the hospital, and I was unable to attend your recent public hearing at the Renton Senior Center. Do know, however, that I am interested in the PACCAR cleanup.

I only live one block from the front of the PACCAR property facing North 4th Street, and I am concerned about what effects the cleanup will have on our residents in North Renton.

My neighbor told me that PACCAR was planning to move the disturbed soils to the south half of the property and to handle much of the cleanup on the portion that is closest to us residents.

I would trust that DOE will be concerned about the residents and not what is the easiest thing to do. Having toxic materials that close to us is very bothersome, and surely you won't suggest that this plan should be followed which would be so close to us. Not only are we concerned about the toxins, but we would be concerned about the visual effects and the hauling routes.

Please reconsider and don't put the toxins on the south half.

Thank you.

Yours truly,

Marjorie J. Richter

MARJORIE RICHTER

Address:
300 Meadow Av N
Renton WA 98055

Margaret Robertson

235 Garden Avenue North
Renton, Washington 98055

Department of Ecology
Bellevue, Washington 98004

Regarding PACCAR

To whom it may concern:

I have been told that you plan to allow Paccar to store toxic soils on the lower half of their site. I object to this as this is too close for comfort to residents who live here.

I hear you have made no plans for cleanup in any other area than directly on the Paccar property. Have you considered testing along Garden to the west of the property? I remember there used to be a ditch along Garden Avenue just to the west and right next to the Paccar site that appeared to be drainage from the foundry. This was on public property evidently, right along the street. The drainage ditch contained yellowish-orange-brown semi-liquid that appeared to come from the foundry; I suggest that you look into this to see if there is needed cleanup along the former ditch.

Again, please don't store the toxic materials on the residential sid of the property. We've had enough from Paccar.

Sincerely yours,

Margaret A. Robertson

MARGARET ROBERTSON

Warren F. Vaupel
Ve...
P.O. Box
Renton, WA

July 11, 1991

To: Department of Ecology

Re: PACCAR cleanup

I spoke at your hearing at the Renton Senior Citizen Center and listened avidly to the presentation, as given by DOE officials.

Please be advised that we find it not only uncomfortable but unacceptabl that the plans are to store toxic grounds on the south half of the site.

I mentioned then, and I will say it again, that you people are evidently unaware that there are residents living across the street from where you plan to store that waste while it aerates and treated/microbes or other means.

The people of North Renton have been abused in many ways because of the unclean and impacting corporations who are neighbors to us. For years, for instance, PACCAR has obviously spewed out toxins not only on its own grounds and employees but surely onto the neighbors, too. We still don' know what contaminates are in our gardens where we continue to grow vege tables. And I realize, as I've said, a lot of people don't want to know or at least have the public know, whether or not their soils are contam-inated because of decrease in property values. I, for one, though, have discontinued having a large garden.

Certainly, we want the site cleaned up, but we don't need to be exposed to more toxins than we have been. We can't be assured of 100 percent safety with anything that is done up there and especially on the south half of the property.

Just how would that toxic soil be stored, even if it is on the north half? Remember, we protest vehemently that it will be on the south sid across the street from residents.

Versie Vaupel

EXHIBIT C
Declaration of Restrictive Covenants
on the PACCAR Property, Renton, Washington

PACCAR Inc., a Delaware corporation ("Declarant") is current owner of the real estate (the "Property") described in Exhibit A attached hereto and made part hereof. Pursuant to Consent Decrees entered in February 1989, and October 1991, in King County Superior Court, Said Property became the subject of a remedial investigation and feasibility study (as from time to time amended, the "RI/FS") and a cleanup action plan (as from time to time amended, the "CAP"), conducted under Washington Department of Ecology ("Ecology") supervision to identify and remediate certain environmental contamination of the Property as more particularly described in said Consent Decrees and RI/FS and CAP.

Pursuant to said Consent Decrees, Declarant hereby subjects the Property to the following restrictive covenants:

1. At least 30 days prior to conveyance of any real property interest in any portion of the Property the grantor shall give written notice to Ecology of such contemplated conveyance describing the particulars thereof.

2. Any conveyance of any real property interest in any portion of the Property is hereby expressly made subject to the provisions of the CAP, including without limitation any provision thereof for continued operation and maintenance, monitoring, containment, or other measures necessary to assure the integrity of the cleanup action. A copy of the Consent Decrees, RI/FS, and CAP shall be furnished to any transferee of any real property interest in any portion of the Property prior to conveyance thereof to such transferee.

3. No wells for the extraction of potable water for human ingestion shall be hereafter installed in the Property without Ecology approval.

4. No redevelopment of the Property other than for industrial use shall hereafter be undertaken unless 30 days prior notice has been given to Ecology. For purposes of this restriction, "industrial use" means and includes any use permitted pursuant to the provisions of Renton Municipal Code 4-713 (Heavy Industry District (H-1)), 4-712 (Light Industry District (L-1)), 4-730 (Manufacturing Park (M-P) District), Business District (B-1), and 4-748 (Conditional Use Permit) as in effect on the date hereof, and any substantially similar uses hereafter permitted under

successor Renton zoning ordinances. The Property shall not be used for a day care center without Ecology approval.

5. Ecology and its designated representatives are hereby given the right to enter the property at reasonable times, upon 48 hours prior notice, for the purpose of evaluating compliance with the cleanup action plan, including the right to take samples, inspect the operation of cleanup action measures, and inspect cleanup records.

6. This Declaration of Restrictive Covenants may be amended by the agreement of Declarant and Ecology after public notice and comment.

7. Notices given to Ecology pursuant to this Declaration of Restrictive Covenants shall be deemed effectively given if delivered by hand or mailed by U.S. certified Mail, return receipt requested, to Washington Department of Ecology, Northwest Regional Office, Attn: Section Head, Toxics Cleanup Program, or to any successor agency or officer thereof having substantially comparable functions.

8. Declarant, and Ecology by its approval of this Declaration as endorsed hereon, agree that any dispute concerning the interpretation, duration, or applicability of the foregoing restrictive covenants shall, failing agreement between the parties, be submitted for determination to the Superior Court for King County, Washington, having jurisdiction over the Consent Decrees.

9. The foregoing Restrictive Covenants shall no longer limit uses of the Site or be of any further force or effect upon recordation by Declarant, or its grantees, successors, or assigns of an instrument terminating this Declaration of Restrictive Covenants pursuant to the terms of the 1991 Consent Decree.

The foregoing restrictive covenants shall henceforth burden and run with the Property and bind Declarant, its grantees, successors, and assigns, and shall insure to the benefit of and be enforceable by Ecology and its successors and assigns. Except only as limited by the express provisions of the foregoing restrictive covenants, Declarant expressly reserves all right of ownership, use, and enjoyment of the Property.

Executed this 7th day of October, 1991.

PACCAR Inc.

By _____
Its President

(Seal)

Attest:

By: Bruce N. Holliday
Its: Assistant Secretary

Approved:

State of Washington
Department of Ecology
Kenneth O. Eikenberry
Attorney General

By: _____
~~Assistant~~ Attorney General
Attorneys for State

_____
Carol Flekkes
Program Manager, Toxics
Cleanup Program, Washington
Department of Ecology

STATE OF WASHINGTON
COUNTY OF King } ss.

On this 7th day of October, 1991, before me, the undersigned, a Notary Public in and for the State of Washington, duly commissioned and sworn, personally appeared Joseph M. Dunn and Bruce N. Holliday to me known to be the President and Assistant Secretary, respectively, of PACCAR Inc the corporation that executed the foregoing instrument, and acknowledged the said instrument to be the free and voluntary act and deed of said corporation, for the uses and purposes therein mentioned, and on oath stated that They are authorized to execute the said instrument and that the seal affixed is the corporate seal of said corporation.

Witness my hand and official seal hereto affixed the day and year first above written.

Nancy J. Duehn

Notary Public in and for the State of Washington,
residing at Seattle
My appointment expires: 4-22-93