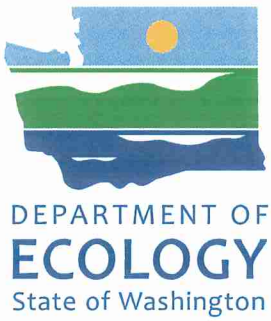

Responsiveness Summary

Draft Final Remedial Investigation and Feasibility Study Reports
Kaiser Trentwood Site

Public Comment Period January 5 through March 6, 2012

Prepared by
Washington State Department of Ecology
Eastern Regional Office
Toxics Cleanup Program
Spokane, WA

March 2012

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KAISER TRENTWOOD SITE
RESPONSIVENESS SUMMARY

The Washington Department of Ecology (Ecology) held a 60-day public comment period from January 5 through March 6, 2012 for the following Kaiser Trentwood Site draft final Remedial Investigation (RI) and Feasibility Study (FS) reports:

- Site-Wide Groundwater Remedial Investigation (Vols. I and II), November 2009
- Site-Wide Soil Remedial Investigation (Vols. I and II), November 2009
- Human Health and Ecological Risk Assessment, December 2009
- Feasibility Study Technical Memorandum, March 2010
- Feasibility Study Report (Vols. I and II), November 2011.

This RI/FS was conducted under the authority of the Model Toxics Control Act (MTCA) Cleanup Regulation (chapter 173-340 WAC) as required under Agreed Order No. 2692. This cleanup is focused on the contamination in soils and groundwater at the Kaiser Site.

A public meeting was held on January 26, 2012 to discuss the above reports, to answer questions, and to solicit written comments. No written comments were received during the public meeting. The purpose of this Responsiveness Summary is to document Ecology's responses to written comments sent to Ecology during the public comment period.

Ecology would like to thank all those who provided comments. Based on the comments received, no changes will be required to the above reports. These reports are therefore final.

The Responsiveness Summary is organized as follows:

I. Index of comments received

IA. Index of comments received during the January 5 through March 6, 2012 public comment period.

IB. Index of comments received outside (before and after) the January 5 through March 6, 2012 public comment period. Note: Comments received before or after the comment period did not meet the comment period guidelines and are considered invalid.

I. INDEX OF COMMENTS RECEIVED

IA. Index of comments received during the January 5 through March 6, 2012 public comment period.

1. **67 post cards** (pages IIA-1to IIA-23 of attached comments).
2. Letter from Matthew Ewers, Principal & Vice President, IEDS, dated January 11, 2012 and received January 13, 2012 (page IIA-24 of attached comments).
3. Letter from David T. Ruff, Craig Lee, Traci Hanegan, Tom Arnold, and Phil Pintor, Coffman Engineers, dated January 18, 2012 and received January 23, 2102 (page IIA-25 of attached comments).
4. Letter from Dave Smith, District Manager, Kaman Industrial Technologies, dated January 25, 2012 and received January 31, 2012 (page IIA-26 of attached comments).
5. Letter from James B. Harakas, Senior Principal, GeoEngineers, dated January 30, 2012, and received February 01, 2012 (page IIA-27 of attached comments).
6. Letter from Eldonna Shaw, President & CEO, Greater Spokane Valley Chamber of Commerce, dated January 25, 2012 and received February 17, 2012 (page IIA-28 of attached comments).
7. Letter from Don Z. Ting, COO/EVP, Pyrotek, dated January 27, 2012 and received March 5, 2012 (page IIA-29 of attached comments).
8. E-mail from Gene Werden sent on March 5, 2012 (page IIA-30 of attached comments).
9. Letter dated March 6, 2012 from Brian Crossley, Water & Fish Program Manager, Spokane Tribe, Dept. of Natural Resource, sent by e-mail on March 6, 2012 (pages IIA-31 and IIA-32 of attached comments).
10. Letter dated March 6, 2012 from Eric Williams sent by e-mail on March 6, 2012 (page IIA-33 of attached comments).
11. Letter dated March 6, 2012, with attachments, from Bart Mihailovich, Spokane Riverkeeper, and Mike Petersen, The Lands Council, sent by e-mail on March 6, 2012 (Pages IIA-34 to IIA-56 of attached documents).

IIB. Index of comments received outside (before and after) the January 5 through March 6, 2012 public comment period.

1. **27 post cards** (pages IIB-1 to IIB-9 of attached comments).
2. Letter from Don Ting, COO/EVP, Pyrotek, sent by e-mail on March 7, 2012 (page IIB-10 of attached comments).

IIA

COMMENTS RECEIVED DURING THE JANUARY 5 THROUGH MARCH 6, 2012 PUBLIC COMMENT PERIOD

I Support Kaiser's Remediation Plan and the Proposed Alternatives

I support Kaiser's recommended overall remediation plan for soil and groundwater at the Trentwood site. Specifically, I support the recommended alternatives for:

- Removal and capping of contaminated soil
- Continued containment of groundwater impacted by oils
- Expansion of removal systems for oils on groundwater
- Containment system for groundwater PCB contamination

I urge your selection of Kaiser's remediation plan and the recommended alternatives.

Name DANIEL AGA

Address 5706 W Dorothy Ct
SPOKANE WA 99208

Signature

RECEIVED
JAN 06 2012
DEPARTMENT OF ECOLOGY
EASTERN REGIONAL OFFICE

I Support Kaiser's Remediation Plan and the Proposed Alternatives

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I urge your selection of Kaiser's remediation plan and the recommended alternatives.

Name PAUL AGA

Address 3327 E. OLIVE
SPOKANE WA 99202

Signature

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I urge your selection of Kaiser's remediation plan and the recommended alternatives.

Name JOEL BARBOUR

Address 15716 N SYCAMORE
MEAD, WA 99021

Signature

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JAN 06 2012
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RECEIVED
JAN 06 2012
DEPARTMENT OF ECOLOGY
EASTERN REGIONAL OFFICE

Name STEVEN P. BRADLEY

Address 503 N. LOCUST
SPOKANE, WA 99206-3827

Signature Steven P. Bradley

s Remediation Plan sed Alternatives

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- Removal and capping of contaminated soil
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I urge your selection of Kaiser's remediation plan and the recommended alternatives.

Name ROBERTA CAMPEA

Address 121 Terrace Ave.
Newport, WA 99156

Signature Roberta Campea

RECEIVED
JAN 06 2012
DEPARTMENT OF ECOLOGY
EASTERN REGIONAL OFFICE

I Support Kaiser's R and the Proposed Alternatives

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I urge your selection of Kaiser's remediation plan and the recommended alternatives.

Name Kip Conley

Address 4223 W. BISMARK
SPOKANE WA 99205

Signature Kip Conley

RECEIVED
JAN 06 2012
DEPARTMENT OF ECOLOGY
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I urge your selection of Kaiser's remediation plan and the recommended alternatives.

Name TERRY FARMER

Address 2949 N. HOWELL RD.
POST FALLS ID. 83854

Signature Terry Farmer

I Support Kaiser's Remediation Plan and the Proposed Alternatives

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I urge your selection of Kaiser's remediation plan and the recommended alternatives.

Name JEFF MIDDLETON

Address 1819 S. PERRY ST.
SPOKANE, WA 99203

Signature

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I urge your selection of Kaiser's remediation plan and the recommended alternatives.

Name Ray Somerday

Address 14429 S. MERRIMEY RD.
Cheney WA 99004

Signature Ray Somerday

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I urge your selection of Kaiser's remediation plan and the recommended alternatives.

Name Colin Thompson

Address PO Box 2507
Spokane WA 99220

Signature

RECEIVED
JAN 06 2012
DEPARTMENT OF ECOLOGY
EASTERN REGIONAL OFFICE

s Remediation Plan
sed Alternatives

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I urge your selection of Kaiser's remediation plan and the recommended alternatives.

Name Pamela Yost

Address 9017 N. Malvern Rd
Newman Lk, WA 99025

Signature Pamela J Yost

RECEIVED
JAN 06 2012
DEPARTMENT OF ECOLOGY
EASTERN REGIONAL OFFICE

I Support Kaiser's R
and the Propose

I support Kaiser's recommended overa
groundwater at the Trentwood site. Specifically, I support the recommended alternatives for:

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I urge your selection of Kaiser's remediation plan and the recommended alternatives.

RECEIVED
JAN 09 2012
DEPARTMENT OF ECOLOGY
EASTERN REGIONAL OFFICE

Name Michael Bossio

Address 9601 E Montgomery Ave
Spo Valley, WA 99206

Signature

I Support Kaiser's Remediation Plan and the Proposed Alternatives

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RECEIVED
JAN 09 2012
DEPARTMENT OF ECOLOGY
EASTERN REGIONAL OFFICE

Name STEVE BROWN

Address 9601 E. Montgomery
Spokane Valley WA

Signature Steve Brown

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RECEIVED
JAN 09 2012
DEPARTMENT OF ECOLOGY
EASTERN REGIONAL OFFICE

Name Steve Downey

Address 1221 S. Bannen
Spokane Valley, WA 99037

Signature Steve Downey

I Support Kaiser's Re and the Proposed

support Kaiser's recommended overall remediation plan for soil and roundwater at the Trentwood site. Specifically, I support the recommended alternatives for:

Removal and capping of contaminated soil
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Expansion of removal systems for oils on groundwater
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RECEIVED
JAN 09 2012
DEPARTMENT OF ECOLOGY
EASTERN REGIONAL OFFICE

ame Andy Frohlich

ddress 5719 N. Milton
Spokane, WA. 99205

gnature

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RECEIVED
JAN 09 2012
DEPARTMENT OF ECOLOGY
EASTERN REGIONAL OFFICE

Name Bob Hubert

Address 10907 E 21st
Spokane WA 99206

Signature Robert M. Hubert

I Support Kaiser's Remediation Plan and the Proposed Alternatives

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RECEIVED
JAN 09 2012
DEPARTMENT OF ECOLOGY
EASTERN REGIONAL OFFICE

Name David M. Jolie

Address 2501 S. Conklin Ct.
Greenacres, WA

Signature

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RECEIVED
JAN 09 2012
DEPARTMENT OF ECOLOGY
EASTERN REGIONAL OFFICE

Name James Millar

Address 5830 S. Campbell Rd.
Greenacres WA 99016

Signature

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I urge your selection of Kaiser's remediation plan and the recommended alternatives.

Name BRUCE NITTBERG

Address 17603 E. DAYSTAR RD
SPOKANE VALLEY, WA 99016

Signature Bruce Nittberg

I Support Kaiser's Remediation Plan and the Proposed Alternatives

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- Removal and capping of contaminated soil
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I urge your selection of Kaiser's remediation plan and the recommended alternatives.

Name JOHN OSTERBACK

Address 9601 E. MONTGOMERY
SPOKANE, WA 99206

Signature

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I urge your selection of Kaiser's remediation plan and the recommended alternatives.

Name Janet Schmidlkofer

Address 415 N Fancher
Spokane Valley WA 9921

Signature

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RECEIVED
JAN 09 2012
DEPARTMENT OF ECOLOGY
EASTERN REGIONAL OFFICE

Name NICK TORTORELLO

Address 5812 NORTH MOORE
SPOKANE, WA 99205

Signature Nick Tortorello

r's Remediation Plan
osed Alternatives

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RECEIVED
JAN 09 2012
DEPARTMENT OF ECOLOGY
EASTERN REGIONAL OFFICE

Name Craig Turner

Address N. 415 Fancher
Spokane Valley, WA 992

Signature

I Support Kaiser's Re
and the Proposed

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RECEIVED
JAN 09 2012
DEPARTMENT OF ECOLOGY
EASTERN REGIONAL OFFICE

Name DAVID WOLF

Address 14911 E. 11th
Spokane Valley, WA

Signature

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RECEIVED
JAN 10 2012
DEPARTMENT OF ECOLOGY
EASTERN REGIONAL OFFICE

Name Doug Gehring

Address 1115 S Robinhood
Spokane Valley WA 99206

Signature Doug Gehring

s Remediation Plan
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RECEIVED
JAN 10 2012
DEPARTMENT OF ECOLOGY
EASTERN REGIONAL OFFICE

Name BRIAN KELLER

Address 13004 E. 20TH AVE
Spokane, WA 99206

Signature

I Support Kaiser's Re
and the Proposed

I support Kaiser's recommended overall
groundwater at the Trentwood site. Specifically, I support the recommended alternatives for:

- Removal and capping of contaminated soil
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I urge your selection of Kaiser's remediation plan and the recommended alternatives.

RECEIVED
JAN 10 2012
DEPARTMENT OF ECOLOGY
EASTERN REGIONAL OFFICE

Name Mark McTaggart

Address 3524 W Depot Spring
Cheney WA 99004

Signature Mark McTaggart

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RECEIVED
JAN 20 2012
DEPARTMENT OF ECOLOGY
EASTERN REGIONAL OFFICE

Name G. PAUL BECKVOLD

Address 4921 N. Bolivar rd.
Spokane Valley 99216

Signature G. Paul Beckvold

I Support Kaiser's Remediation Plan and the Proposed Alternatives

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RECEIVED
JAN 20 2012
DEPARTMENT OF ECOLOGY
EASTERN REGIONAL OFFICE

Name Klint Coe

Address P.O. Box 730
Mead, WA. 99021

Signature

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RECEIVED
JAN 20 2012
DEPARTMENT OF ECOLOGY
EASTERN REGIONAL OFFICE

Name Chad Holling

Address 37102 S Fem Rd
Rosalia WA 99170

Signature

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Name PAUL MOTES

Address 12423 E. MANSFIELD #99

SPOKANE WA. 99216

Signature

RECEIVED
JAN 20 2012
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EASTERN REGIONAL OFFICE

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I urge your selection of Kaiser's remediation plan and the recommended alternatives.

Name Kevin Richards

Address 6521 N Idaho Rd

Newman Lake WA 99

Signature

RECEIVED
JAN 20 2012
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I urge your selection of Kaiser's remediation plan and the recommended alternatives.

Name Doug Wichterman

Address 16122 N Sunset Ln

Deer Park WA 99006

Signature

RECEIVED
JAN 20 2012
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Name John Wilke

Address E8323 Boone
Spokane WA

Signature John Wilke

...r's Remediation Plan ...posed Alternatives

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I urge your selection of Kaiser's remediation plan and the recommended alternatives.

Name Don Williams

Address 6821 W eastern Rd
Spok 99217

Signature

I Support Kaiser's Rem... and the Proposed A...

...support Kaiser's recommended overall remediation plan for soil and ...roundwater at the Trentwood site. Specifically, I support the recom... ...ended alternatives for:

Removal and capping of contaminated soil
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I urge your selection of Kaiser's remediation plan and the recommended alternatives.

...lame Jack Klene

...ddress 14507 S Freya ST
Spokane WA

...ignature Jack S Klene

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I urge your selection of Kaiser's remediation plan and the recommended alternatives.

Name NEIL C. HECKERMAN, P.E.

Address 8812 North Oakland
Newman LK, WA 99025

Signature

RECEIVED
JAN 24 2012
DEPARTMENT OF ECOLOGY
EASTERN REGIONAL OFFICE

I Support Kaiser's Remediation Plan and the Proposed Alternatives

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I urge your selection of Kaiser's remediation plan and the recommended alternatives.

Name Mark Tiffany

Address 1210 E Blackhawk Dr
Spokane, WA

Signature

RECEIVED
JAN 24 2012
DEPARTMENT OF ECOLOGY
EASTERN REGIONAL OFFICE

I Support Kaiser's Re and the Proposed

I support Kaiser's recommended overall groundwater at the Trentwood site. Specifically, I support the recommended alternatives for:

- Removal and capping of contaminated soil
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I urge your selection of Kaiser's remediation plan and the recommended alternatives.

Name Dan Wilson

Address 15223 E. CATALDO
Spokane Valley, WA. 99037

Signature Dan Wilson

RECEIVED
JAN 25 2012
DEPARTMENT OF ECOLOGY
EASTERN REGIONAL OFFICE

I Support Kaiser's Remediation Plan and the Proposed Alternatives

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I urge your selection of Kaiser's remediation plan and the recommended alternatives.

Name TIM DAIRD

Address PO Box 287
SPANGLE WA 99031

Signature

RECEIVED
JAN 26 2012
DEPARTMENT OF ECOLOGY
EASTERN REGIONAL OFFICE

I Support Kaiser's Remediation Plan and the Proposed Alternatives

I support Kaiser's recommended overall remediation plan for soil and groundwater at the Trentwood site. Specifically, I support the recommended alternatives for:

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I urge your selection of Kaiser's remediation plan and the recommended alternatives.

Name Jeff Collins

Address 8601 W. Crossout Rd
Deer Park, WA 99006

Signature

RECEIVED
JAN 26 2012
DEPARTMENT OF ECOLOGY
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I urge your selection of Kaiser's remediation plan and the recommended alternatives.

Name Jim DeWalt

Address 919 E. 18th Ave.
Spokane 99203

Signature

RECEIVED
JAN 26 2012
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Name BRIAN FAIR

Address 12106 N RUBY
SPOKANE, WA 99218

Signature

RECEIVED
JAN 26 2012
DEPARTMENT OF ECOLOGY
EASTERN REGIONAL OFFICE

's Remediation Plan osed Alternatives

I support Kaiser's recommended overall remediation plan for soil and groundwater at the Trentwood site. Specifically, I support the recommended alternatives for:

- Removal and capping of contaminated soil
- Continued containment of groundwater impacted by oils
- Expansion of removal systems for oils on groundwater
- Containment system for groundwater PCB contamination

I urge your selection of Kaiser's remediation plan and the recommended alternatives.

Name Derek Foehringer

Address 4309 E. Vantage Ln
Spokane, Wa 99217

Signature

RECEIVED
JAN 26 2012
DEPARTMENT OF ECOLOGY

I Support Kaiser's R and the Proposed

I support Kaiser's recommended overall groundwater at the Trentwood site. Specifically, I support the recommended alternatives for:

- Removal and capping of contaminated soil
- Continued containment of groundwater impacted by oils
- Expansion of removal systems for oils on groundwater
- Containment system for groundwater PCB contamination

I urge your selection of Kaiser's remediation plan and the recommended alternatives.

Name DAVID HELSING

Address 12626 W PINE RIDGE LP.
CHENEY WA 99004

Signature

RECEIVED
JAN 26 2012
DEPARTMENT OF ECOLOGY
EASTERN REGIONAL OFFICE

I Support Kaiser's Remediation Plan and the Proposed Alternatives

I support Kaiser's recommended overall remediation plan for soil and groundwater at the Trentwood site. Specifically, I support the recommended alternatives for:

- Removal and capping of contaminated soil
- Continued containment of groundwater impacted by oils
- Expansion of removal systems for oils on groundwater
- Containment system for groundwater PCB contamination

I urge your selection of Kaiser's remediation plan and the recommended alternatives.

Name Melissa Hoob

Address 4111 N. Ash
Spokane WA 99202

Signature Melissa Hoob

RECEIVED
JAN 26 2012
DEPARTMENT OF ECOLOGY
EASTERN REGIONAL OFFICE

I Support Kaiser's Remediation Plan and the Proposed Alternatives

I support Kaiser's recommended overall remediation plan for soil and groundwater at the Trentwood site. Specifically, I support the recommended alternatives for:

- Removal and capping of contaminated soil
- Continued containment of groundwater impacted by oils
- Expansion of removal systems for oils on groundwater
- Containment system for groundwater PCB contamination

I urge your selection of Kaiser's remediation plan and the recommended alternatives.

Name Terry Hunt

Address 14702 TALLMAN RD #2
CHATTAROY WA 99003

Signature

RECEIVED
JAN 26 2012
DEPARTMENT OF ECOLOGY
EASTERN REGIONAL OFFICE

I Support Kaiser's Re and the Proposed

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- Removal and capping of contaminated soil
- Continued containment of groundwater impacted by oils
- Expansion of removal systems for oils on groundwater
- Containment system for groundwater PCB contamination

I urge your selection of Kaiser's remediation plan and the recommended alternatives.

Name Alan Hunter

Address 324 E. Broadway
Spo. Wash 99207

Signature

RECEIVED
JAN 26 2012
DEPARTMENT OF ECOLOGY
EASTERN REGIONAL OFFICE

I Support Kaiser's Remediation Plan and the Proposed Alternatives

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- Removal and capping of contaminated soil
- Continued containment of groundwater impacted by oils
- Expansion of removal systems for oils on groundwater
- Containment system for groundwater PCB contamination

I urge your selection of Kaiser's remediation plan and the recommended alternatives.

Name Chad Lindsey

Address 16821 W. Lakeside Dr
Medical Lake, WA 99022

Signature Chad Lindsey

I Support Kaiser's Remediation Plan and the Proposed Alternatives

I support Kaiser's recommended overall remediation plan for soil and groundwater at the Trentwood site. Specifically, I support the recommended alternatives for:

- Removal and capping of contaminated soil
- Continued containment of groundwater impacted by oils
- Expansion of removal systems for oils on groundwater
- Containment system for groundwater PCB contamination

I urge your selection of Kaiser's remediation plan and the recommended alternatives.

Name Mat Morrell

Address 4972 Bowlen Rd
Springdale WA 99173

Signature Mat Morrell

I Support Kaiser's R and the Proposed

I support Kaiser's recommended overall remediation plan for soil and groundwater at the Trentwood site. Specifically, I support the recommended alternatives for:

- Removal and capping of contaminated soil
- Continued containment of groundwater impacted by oils
- Expansion of removal systems for oils on groundwater
- Containment system for groundwater PCB contamination

I urge your selection of Kaiser's remediation plan and the recommended alternatives.

Name Phil Pintar

Address 10 N. Post St.
Suite 500, Spokane, WA 99201

Signature Phil Pintar

I Support Kaiser's Remediation Plan and the Proposed Alternatives

I support Kaiser's recommended overall remediation plan for soil and groundwater at the Trentwood site. Specifically, I support the recommended alternatives for:

- Removal and capping of contaminated soil
- Continued containment of groundwater impacted by oils
- Expansion of removal systems for oils on groundwater
- Containment system for groundwater PCB contamination

I urge your selection of Kaiser's remediation plan and the recommended alternatives.

Name DAVID T. RUFF

Address 6223 PEARSON DRIVE
NINE MILE FALLS, WA 99026

Signature

RECEIVED
JAN 26 2012
DEPARTMENT OF ECOLOGY
EASTERN REGIONAL OFFICE

I Support Kaiser's Remediation Plan and the Proposed Alternatives

I support Kaiser's recommended overall remediation plan for soil and groundwater at the Trentwood site. Specifically, I support the recommended alternatives for:

- Removal and capping of contaminated soil
- Continued containment of groundwater impacted by oils
- Expansion of removal systems for oils on groundwater
- Containment system for groundwater PCB contamination

I urge your selection of Kaiser's remediation plan and the recommended alternatives.

Name Brian Smith

Address 4807 E Lone Pork Rd
Mead WA 99021

Signature

RECEIVED
JAN 26 2012
DEPARTMENT OF ECOLOGY
EASTERN REGIONAL OFFICE

I Support Kaiser's Remediation Plan and the Proposed Alternatives

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- Removal and capping of contaminated soil
- Continued containment of groundwater impacted by oils
- Expansion of removal systems for oils on groundwater
- Containment system for groundwater PCB contamination

I urge your selection of Kaiser's remediation plan and the recommended alternatives.

Name BOB ULRICH

Address 10 N. POST STREET, STE 500
SPOKANE WA 99201

Signature

RECEIVED
JAN 26 2012
DEPARTMENT OF ECOLOGY
EASTERN REGIONAL OFFICE

I Support Kaiser's Remediation Plan and the Proposed Alternatives

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- Removal and capping of contaminated soil
- Continued containment of groundwater impacted by oils
- Expansion of removal systems for oils on groundwater
- Containment system for groundwater PCB contamination

I urge your selection of Kaiser's remediation plan and the recommended alternatives.

Name Jeff Stickelmeyer

Address 2722 W Olympic
Spokane WA 9920

Signature Jeff Stickelmeyer

RECEIVED
JAN 27 2012
DEPARTMENT OF ECOLOGY
EASTERN REGIONAL OFFICE

RECEIVED
JAN 27 2012
DEPARTMENT OF ECOLOGY
EASTERN REGIONAL OFFICE

I Support Kaiser's Remediation Plan and the Proposed Alternatives

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- Removal and capping of contaminated soil
- Continued containment of groundwater impacted by oils
- Expansion of removal systems for oils on groundwater
- Containment system for groundwater PCB contamination

I urge your selection of Kaiser's remediation plan and the recommended alternatives.

Name James Burger

Address 9601 E. Montgomery
Spokane WA 99206

Signature James Burger

RECEIVED
JAN 30 2012
DEPARTMENT OF ECOLOGY
EASTERN REGIONAL OFFICE

I Support Kaiser's Remediation Plan and the Proposed Alternatives

I support Kaiser's recommended overall remediation plan for soil and groundwater at the Trentwood site. Specifically, I support the recommended alternatives for:

- Removal and capping of contaminated soil
- Continued containment of groundwater impacted by oils
- Expansion of removal systems for oils on groundwater
- Containment system for groundwater PCB contamination

I urge your selection of Kaiser's remediation plan and the recommended alternatives.

Name Jeff McFarlen

Address 9601 E Montgomery
Spokane Valley 99206

Signature Jeff McFarlen

RECEIVED
JAN 30 2012
DEPARTMENT OF ECOLOGY
EASTERN REGIONAL OFFICE

I Support Kaiser's Remediation Plan and the Proposed Alternatives

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- Removal and capping of contaminated soil
- Continued containment of groundwater impacted by oils
- Expansion of removal systems for oils on groundwater
- Containment system for groundwater PCB contamination

I urge your selection of Kaiser's remediation plan and the recommended alternatives.

Name Jeff Grittner

Address 1611 east Rich

Spokane WA. 99207

Signature [signature]

RECEIVED
FEB 01 2012
DEPARTMENT OF ECOLOGY
EASTERN REGIONAL OFFICE

s Remediation Plan sed Alternatives

I support Kaiser's recommended overall remediation plan for soil and groundwater at the Trentwood site. Specifically, I support the recommended alternatives for:

- Removal and capping of contaminated soil
- Continued containment of groundwater impacted by oils
- Expansion of removal systems for oils on groundwater
- Containment system for groundwater PCB contamination

I urge your selection of Kaiser's remediation plan and the recommended alternatives.

Name JOHN HANEY

Address 3430 W. 21ST AVE.

SPOKANE, WA 99224

Signature [signature]

RECEIVED
FEB 02 2012
DEPARTMENT OF ECOLOGY
EASTERN REGIONAL OFFICE

I Support Kaiser's R and the Proposec

I support Kaiser's recommended overall remediation plan for soil and groundwater at the Trentwood site. Specifically, I support the recommended alternatives for:

- Removal and capping of contaminated soil
- Continued containment of groundwater impacted by oils
- Expansion of removal systems for oils on groundwater
- Containment system for groundwater PCB contamination

I urge your selection of Kaiser's remediation plan and the recommended alternatives.

Name Jim Horakas

Address 523 E. Jecord Ave

Spokane, WA 99202

Signature [signature]

RECEIVED
FEB 02 2012
DEPARTMENT OF ECOLOGY
EASTERN REGIONAL OFFICE

I Support Kaiser's Remediation Plan and the Proposed Alternatives

I support Kaiser's recommended overall remediation plan for soil and groundwater at the Trentwood site. Specifically, I support the recommended alternatives for:

FEB 02 2012

- Removal and capping of contaminated soil
- Continued containment of groundwater impacted by oils
- Expansion of removal systems for oils on groundwater
- Containment system for groundwater PCB contamination

I urge your selection of Kaiser's remediation plan and the recommended alternatives.

Name CRAIG LEE

Address 6812 N. GREENWOOD BLVD.
SPOKANE, WA 99208

Signature Craig Lee

I Support Kaiser's Remediation Plan and the Proposed Alternatives

I support Kaiser's recommended overall remediation plan for soil and groundwater at the Trentwood site. Specifically, I support the recommended alternatives for:

- Removal and capping of contaminated soil
- Continued containment of groundwater impacted by oils
- Expansion of removal systems for oils on groundwater
- Containment system for groundwater PCB contamination

I urge your selection of Kaiser's remediation plan and the recommended alternatives.

Name Kevin Rantell

Address 921 Malvern Rd
Liberty Lake, WA 99019

Signature Kevin Rantell

RECEIVED
FEB 02 2012
DEPARTMENT OF ECOLOGY
EASTERN REGIONAL OFFICE

I Support Kaiser's Remediation Plan and the Proposed Alternatives

I support Kaiser's recommended overall remediation plan for soil and groundwater at the Trentwood site. Specifically, I support the recommended alternatives for:

- Removal and capping of contaminated soil
- Continued containment of groundwater impacted by oils
- Expansion of removal systems for oils on groundwater
- Containment system for groundwater PCB contamination

I urge your selection of Kaiser's remediation plan and the recommended alternatives.

FEB 03 2012

Name Roger Arne

Address 25503 E Lincoln
Newman Lk, WA 99025

Signature Roger Arne

I Support Kaiser's Remediation Plan and the Proposed Alternatives

I support Kaiser's recommended overall remediation plan for soil and groundwater at the Trentwood site. Specifically, I support the recommended alternatives for:

- Removal and capping of contaminated soil
- Continued containment of groundwater impacted by oils
- Expansion of removal systems for oils on groundwater
- Containment system for groundwater PCB contamination

I urge your selection of Kaiser's remediation plan and the recommended alternatives.

Name Matt Blankenship

Address 523 E. 2nd Ave

Spokane, WA 99202

Signature Matt Blankenship

RECEIVED
FEB 03 2012
DEPARTMENT OF ECOLOGY
EASTERN REGIONAL OFFICE

I Support Kaiser's Remediation Plan and the Proposed Alternatives

I support Kaiser's recommended overall remediation plan for soil and groundwater at the Trentwood site. Specifically, I support the recommended alternatives for:

- Removal and capping of contaminated soil
- Continued containment of groundwater impacted by oils
- Expansion of removal systems for oils on groundwater
- Containment system for groundwater PCB contamination

I urge your selection of Kaiser's remediation plan and the recommended alternatives.

Name Carlson Sheet Metal

Address 3621 E Broadway

Spokane, Wa 99202

Signature

RECEIVED
FEB 06 2012
DEPARTMENT OF ECOLOGY
EASTERN REGIONAL OFFICE

I Support Kaiser's Remediation Plan and the Proposed Alternatives

I support Kaiser's recommended overall remediation plan for soil and groundwater at the Trentwood site. Specifically, I support the recommended alternatives for:

- Removal and capping of contaminated soil
- Continued containment of groundwater impacted by oils
- Expansion of removal systems for oils on groundwater
- Containment system for groundwater PCB contamination

I urge your selection of Kaiser's remediation plan and the recommended alternatives.

Name Brent Randall

Address 523 East Second Avenue
Spokane, WA 99202

Signature

RECEIVED
FEB 06 2012
DEPARTMENT OF ECOLOGY
EASTERN REGIONAL OFFICE

I Support Kaiser's Remediation Plan and the Proposed Alternatives

I support Kaiser's recommended overall remediation plan for soil and groundwater at the Trentwood site. Specifically, I support the recommended alternatives for:

- Removal and capping of contaminated soil
- Continued containment of groundwater impacted by oils
- Expansion of removal systems for oils on groundwater
- Containment system for groundwater PCB contamination

I urge your selection of Kaiser's remediation plan and the recommended alternatives.

Name DOUG KRAPAS

Address 3320 N. ARGONNE
SPOKANE, WA 99212

Signature

RECEIVED
FEB 07 2012
DEPARTMENT OF ECOLOGY
EASTERN REGIONAL OFFICE

INLAND EMPIRE DISTRIBUTION SYSTEMS

Quality in Motion

January 11, 2012

Ms. Teresita Bala
WA Department of Ecology
4601 N. Monroe Street
Spokane, WA 99205-1295

Dear Ms. Bala:

By way of this letter, I would like to submit my comments with regard to the Kaiser Trentwood's Site Toxics Cleanup Program, **Facility Site ID No. 53481373** (CSID No. 7093).

Recently I was invited to tour the facility in Spokane Valley and was impressed with the amount of environmental work already completed at the site. It is obvious that Kaiser is committed to cleaning up the 70+ year old site and protecting the Spokane River by providing the proper resources to test and remedy the situation.

I support the overall recommended remediation plan for the soil and groundwater including recommended alternatives. This is a strong and balanced approach to ensuring environmental protection.

Kaiser Aluminum is an important manufacturing company within our community providing high paying jobs with exceptional benefits. In addition to Kaiser's investment in the environmental cleanup, they have recently invested over $100 million in the plant, thereby solidifying their presence in the area. These investments allow them to provide a high quality product at a faster lead time and meet the demand from aerospace companies located all over the word.

In addition, there are several suppliers to Kaiser operating in the Spokane and Coeur d'Alene region benefiting from this company's success. In fact, there are over 300 local suppliers generating at least $100k per year in revenue from Kaiser. Exporting product produced in Spokane increases our local economy and our standard of living.

Thank you Teresita for taking your valuable time to read my perspective regarding this important issue.

Sincerely,

Matthew Ewers
Principal & Vice President

Warehousing & Distribution

Spokane Industrial Park, Building 32 • 3808 North Sullivan Road • Spokane, WA 99216 • Phone 509 922-0944 • Fax 509 927-8593

January 18, 2012

Dr. Teresita Bala
Department of Ecology
4601 N. Monroe Street
Spokane, WA 99205-1295

Subject: Kaiser Trentwood Remediation Plan

Dear Dr. Bala:

Coffman Engineers is a civil, structural, mechanical, and electrical engineering firm located in Spokane. We have over a 30 year history of engineering and design for Kaiser Aluminum. We employ 65 people in Spokane and through the years Kaiser has been one of our biggest clients.

Although we have had only a minimal involvement with the environmental remediation projects that Kaiser has engaged in (and no involvement in the development of the current alternatives), we are very aware of the significant efforts that Kaiser has made in this regard. Recently, we toured their facility and were reminded of the strides that Kaiser has made to protect our groundwater. As engineers we stand committed to the health of our environment and especially our aquifer and Spokane River. We are grateful to have a corporate citizen like Kaiser that is taking its care seriously.

We have reviewed Kaiser's recommended alternatives for continued protection of this resource and support their approaches to site clean-up and river protection. We view these alternatives as the appropriate level of investment for the stewardship of these resources.

Thank you for taking the time to understand our viewpoint.

Sincerely,

David T. Ruff, P.E.
Managing Principal, Vice President

Craig Lee, P.E., S.E.
Principal

Traci Hanegan, P.E.
Principal

Tom Arnold, P.E.
Principal

Phil Pintor, P.E.
Principal

SPOKANE
10 N. Post St., Suite 500
Spokane, WA 99201
ANCHORAGE 907.276.6664
HONOLULU 808.687.8884
LOS ANGELES 818.285.2650
SEATTLE 206.623.0717

Kaman Industrial Technologies

KAMAN

4115 E TRENT AVE
SPOKANE WA 99223
1-800-365-6221
FAX 509-535-8379

January 25, 2012

Dr. Teresita Bala
Department of Ecology
4601 N Monroe Street
Spokane, WA 99205-1295

Dear Dr. Bala:

I am writing to you to provide comments on the Remedial Investigation, Risk Assessment, Feasibility Study Technical Memorandum, and Feasibility Study Reports for the Kaiser Trentwood Site.

I was invited to see first hand the steps taken to do environmental cleanup at the Kaiser Trentwood site. I am impressed with the amount, and thoroughness of the work already completed. They have identified what needs to be done to clean up the site and how to maintain good practices. I support the recommended alternatives for clean up of the site and the protection of the river and its surroundings. The approaches used I found to be sensible and balanced.

Kaiser has a large impact on our local business environment. There is supporting business employment outside of Kaiser that helps support families and adds to our community. Kaman is one of many that enjoy a business relationship with Kaiser. This relationship enables us to add to the local economy, and community, like many others.

I want to thank the Department of Ecology for taking the time to read my comments. Kaman supports working with Companies that are as environmental and community minded as Kaiser Aluminum.

Sincerely

Dave Smith
District Manager
Kaman Industrial Technologies

January 30, 2012

Washington State Department of Ecology
4601 North Monroe Street
Spokane, Washington 99205-1295

Attention: Dr. Teresita Bala

Subject: Kaiser Aluminum
Remedial Investigation/Feasibility Study, Risk Assessment
Kaiser Trentwood Site
Spokane Valley, Washington

This letter provides my comments on the above mentioned reports for the Kaiser Trentwood site in Spokane Valley, Washington. My comments are based on observations I made during a tour of the site.

Frankly, I was very impressed with the extent of environmental cleanup work that Kaiser has accomplished in recent years. I also was very interested to learn of the assessment work Kaiser has completed delineating cleanup work, which is yet to be completed.

With this letter, I want to express my strong support for the recommended soil and groundwater cleanup alternatives, which are contained in the referenced feasibility study. They are pragmatic approaches which, if implemented, should address impacts to the environment that would occur or continue without such cleanup operations.

My company has been fortunate to be able to provide engineering services to Kaiser over the past several years. As Kaiser's viability as an aluminum manufacturer has rebounded in recent years, my company has been very fortunate to be a vendor of professional services. Our working relationship with Kaiser is just one small example of Kaiser's contribution to the economy of the Inland Northwest.

I appreciate the opportunity to submit these comments. Please don't hesitate to contact me if you have any questions regarding the contents of this letter.

Sincerely,

James B Harakas, PE, LEG
Senior Principal

JBH:jlr

8508 East Broad Lane
Spokane Valley, Washington
509-993-3870

GeoEngineers

Wash
Attn:
4601

GREATER SPOKANE VALLEY CHAMBER OF COMMERCE

January 25, 2012

Dr. Teresita Bala
State of Washington
Department of Ecology
4601 N. Monroe Street
Spokane, WA 99205-1295

Dear Dr. Bala:

I am writing to you on behalf of the Board of Directors of the Greater Spokane Valley Chamber of Commerce in support the efforts of our member, Kaiser Aluminum Trentwood Works. We wish to provide comments on the Remedial Investigation, Risk Assessment, Feasibility Study Technical Memorandum and Feasibility Study Reports for the Kaiser Trentwood site.

Recently I and other members of our Board had the opportunity to tour the Kaiser site and were very impressed with the amount of environmental cleanup work already completed as a part of extensive renovations to the plant site. They have been very thorough and have created a state of the art manufacturing plant with great attention to detail toward use of natural resources. They have installed a very effective water filtration system. I was impressed with what they have done to identify problems created by past manufacturing practices. When the plant was built in the early 1940's, much was unknown throughout business and industry about the effects of contaminants. By utilizing current scientific knowledge, they are taking measures to correct past and prevent future problems.

We support the recommended alternatives for the soil and groundwater contained in the Feasibility Study. They are sensible and balanced approaches for cleaning up the site and protecting the Spokane River.

Kaiser has been a member of the Greater Spokane Valley Chamber of Commerce since 1943 and has been a valued member and significant employer in our community. They have developed processes to create high tech materials needed by the aerospace industry. These products are in demand internationally due to their precision and ability to meet complex specifications. The plant now employs 850 people and is key to continued economic development of the region and the aerospace industry in Washington.

I want to thank the Department of Ecology for taking the time to consider our perspective.

Sincerely,

Eldonna Shaw
President & CEO

9507 E Sprague • Spokane Valley, WA 99206 • (509) 924-4994 • Fax (509) 924-4992

Pyrotek Corporate Office
9503 E. Montgomery Avenue
Spokane Valley, WA 99206
Phone: 509-926-6212
Fax: 509-927-2408
e-mail: info@pyrotek.info
www.pyrotek.info

February 27, 2012

Ms. Teresita Bala
WA Dept of Ecology
4601 N. Monroe
Spokane, WA 99205

Dear Ms. Bala,

As a resident of Spokane where my family and business reside, I wanted to share my gratitude and confidence in how the Department of Ecology and Kaiser Aluminum are tackling the environmental issues on the Trentwood site. I had no idea of the issues facing Trentwood prior to the Public Meeting. I am impressed with the extent and thoroughness of the evaluation. In particular, I am grateful for the special attention devoted to PCB and petroleum containment and removal.

I am also the COO of Pyrotek, an industrial manufacturer of engineered products and a supplier to Kaiser for over 50 years. I trust that Kaiser will fulfill their responsibilities as corporate citizens in a conscientious manner with all the resources they have at their disposal. Many of their managers have lived in Spokane for decades and have extended family living here as well. They drink from the same aquifer and enjoy recreating on the Spokane River like we do. I am sure they all have a strong vested interest in doing the right thing for protecting the environment for themselves and their grandchildren. I can also share that in 50 years of doing business with Kaiser; they have always acted ethically and responsibly.

Thank you for your efforts in resolving these environmental challenges. We appreciate how closely Ecology and Kaiser are working together to bring solutions to Spokane. We look forward to hearing of the progress you will make. If you would like any further input, please don't hesitate to call.

Sincerely,

Don Z. Ting
COO/EVP

Bala, Teresita F. (ECY)

From: Gene W [genos68@yahoo.com]
Sent: Monday, March 05, 2012 2:23 PM
To: Bala, Teresita F. (ECY)
Subject: Kaiser cleanup

I attended the presentation at Trent Elementary School on January 26, 2012. Pumping millions of gallons per day of water for years seems to me to be a poor solution, and not 100 percent effective. Even if the water were returned to the aquifer, it would have been compromised in quality.

Perhaps building an impermeable wall 100 feet deep, encircling the problem sites would cost less money. You could cover the sites to divert the rainwater. Then introduce microbes, other organisms, or chemicals to neutralize the pollution. Inside of the wall would be isolated from the groundwater. With no added rainwater, it would soon stop draining.

Sincerely,

Gene Werden
18924 E. Nixon Ave.
Spokane Valley, WA 99016

email: genos68@yahoo.com
Telephone: 509-435-3896

Spokane Tribal Natural Resources
P.O. Box 100 • Wellpinit, WA 99040 • (509) 258-9042 • fax 258-9600

MEMORANDUM

March 6, 2012

Teresita Bala
WA Department of Ecology
4601 N. Monroe St.
Spokane WA 99205-1295

RE: Draft Kaiser Trentwood Site Cleanup Plan (Sent via email to tbal461@ecy.wa.gov)

Dear Ms. Bala:

Please accept these comments on the Draft Kaiser Trentwood Site Cleanup Plan ("Plan") on behalf of the Department of Spokane Tribal Natural Resources ("Department"). The Department's concerns are listed below. In brief, the Kaiser Facility is one of the largest known sources of PCB contamination along the Spokane River and the Department is very concerned that the Draft Plan does not properly address the magnitude of the contamination, nor does it provide enough certainty that PCB loading to the Spokane River will be reduced.

Comments

(1) The Plan must state that all PCB testing will be done utilizing the latest EPA approved method that detects low levels of PCB's.

(2) The Plan relies on the biodegradation of PCBs as one of the primary remediation tools. The Plan relies on a very small segment of the scientific information regarding biodegradation of PCBs. Additionally, the primary authors of the information relied upon have strong industry ties which calls into question the reliability of it. The Plan's methods must be supported by the scientific community at large. Although biodegradation may be occurring, showing the amount of degradation to reach desired clean-up levels may not be adequate. Additional methods may need to be developed to remediate PCB contamination based on data results.

(3) Dept. of Health recommends no fish consumption from the Idaho border to Upriver Dam. The Plan must require that Kaiser fund regular fish tissue testing and monitoring within the stretch of the Spokane River most affected by it. The Plan's goal is to remediate the site for the safety of the general public. Accordingly, understanding the

pathways that the general public is exposed to PCB and toxics is of the utmost importance.

(4) Kaiser has drilled over 100 test wells on their site but additional sampling such as "lipid bags" should be considered upstream and downstream of the site directly on the Spokane River to evaluate their total PCB load to the River and to monitor the expected reductions.

Brian Crossley
Water & Fish Program Manager
Spokane Tribe, Dept. of Natural Resources

Teresita Bala
Department of Ecology
4601 N. Monroe St
Spokane, Wash 99205-1295
tbal461@ecy.wa.gov

March 6, 2012

Dear Ms. Bala:

I appreciate the opportunity to comment on an issue I believe is of great importance to the economic growth and health of our community. I write today in support of Kaiser Trentwood's remediation plan and the recommended alternatives and ask that you support these alternatives when drafting the Cleanup Action Plan.

As you know, many of the environmental concerns with the Trentwood plant lie in legacy, and not ongoing, contamination issues. Kaiser's historical, discontinued use of PCBs is currently being addressed and the necessary steps to remediate the existing contamination and to halt further pollution are constant. Specifically, I support the recommended alternatives for removing and capping contaminated soil, continued containment of affected groundwater and removal of oil on groundwater.

Thank you for considering my comments. Please select Kaiser's remediation plan and alternatives.

Sincerely,

Eric Williams
318 Plum Tree Court
Cheney, WA 99004

March 6, 2012

Teresita Bala
Washington Department of Ecology
4601 N. Monroe
Spokane, Washington 99205-1295

SENT VIA EMAIL (tbal461@ecy.wa.gov)

RE: Comments on Kaiser Trentwood Remedial Investigation and Feasibility Study

Dear Ms. Bala:

These comments are submitted on behalf of Spokane Riverkeeper ("Riverkeeper") and The Lands Council on the proposed cleanup remedy at Kaiser Trentwood that comes as a result of Kaiser's Remedial Investigation and Feasibility Study. Riverkeeper and The Lands Council are concerned with the scope of the proposed clean up and the science and methods proposed. Because of the ecological and human health concerns with PCBs, our work prioritization and missions to deal with toxic water pollution, and the size of this site, we have enlisted the services of a professional consultant, Peter Lee deFur of Environmental Stewardship Concepts, to review and assist with our comments. Mr. deFur's professional comments (Appendix A), resume (Appendix B), and curriculum vitae (Appendix C) are included as attachments.

Riverkeeper is a program of the Center for Justice ("CFJ"). CFJ is a not-for-profit legal organization which provides legal services to individuals and public interest organizations in the Inland Northwest. Riverkeeper conducts surveillance of the Spokane River and its tributaries and reaches out to river users who share its commitment to a river that is swimmable, fishable, and properly regulated. To further these goals, Riverkeeper actively seeks federal and state agency implementation of the Clean Water Act and, when necessary, directly initiates enforcement actions on behalf of itself and the public.

The Lands Council is a not-for-profit conservation group dedicated to protecting the quality of life and the environment in the Inland Northwest. The Lands Council is concerned about the environment's effect on people's health and works to protect thousands of acres of public land in order to maintain a clean and healthy environment. These lands include forests, water, and wildlife, including but not limited to the Spokane River Watershed. The Lands Council collaborates with a broad range of interested parties including communities, businesses, recreational groups, government agencies, and elected officials to seek smart and mutually respectful solutions to environmental issues. When necessary, The Lands Council uses litigation to protect forests and waters on behalf of its members and the public. The Lands Council seeks to enforce environmental rules necessary to ensure a clean and healthy environment.

Legacy pollutants are a major threat to the health of the Spokane River and the Spokane Valley - Rathdrum Prairie Aquifer ("Aquifer"). They pose a substantial human health risk, and are thus a major priority for the work of Riverkeeper and The Lands Council. One legacy

pollutant of major concern and focus is PCBs (polychlorinated biphenayls). Both Riverkeeper and The Lands Council, as well as the Washington State Department of Ecology ("Ecology") and Kaiser are founding members of the Spokane River Regional Toxics Task Force ("Task Force"). In 2011, Ecology issued National Pollutant Discharge Elimination System (NPDES) Waste Discharge permits to Washington industrial and municipal dischargers that discharge to the Spokane River. In an effort to address toxics, NPDES permits require dischargers to develop and support the Task Force. The Task Force membership represents state, tribal, municipal, industrial, Idaho and Washington environmental agencies, and community groups representing interdisciplinary expertise regarding water quality. We understand the difference between work done as a result of an NPDES permit and this proposed action, but we felt it important to add to our comments because of this collective dedication to PCB clean up and control. Riverkeeper and The Lands Council, by joining the Task Force, have committed to our individual members to do everything possible to influence the highest level of PCB control and clean-up. Thus, we urge Ecology to accept only the most thorough and effective clean-up plan for PCBs at the Kaiser Trentwood site.

Much is unknown about PCBs and how they migrate to the Spokane River; which is exactly why the Task Force was formed. Yet, one thing that we know for sure is that some populations in the Spokane River drainage, most notably tribal populations, consume a high level of fish from the Spokane River. Preventing PCBs from entering the Spokane River via groundwater at Kaiser is and should be a main focus for Ecology. Even though rule-making is ongoing to adjust water quality standards to accurately address fish consumption in the State of Washington, work must be done now to keep numbers from sites like Kaiser at a safe level for human health. Again, it is our recommendation that Ecology looks very carefully at the options for PCB cleanup and removal, and only accepts the method that is most likely to protect the Spokane River, drinking water, and human health.

We understand that EPA Method 1668 has yet to be approved by EPA, but judging by initial analysis, this seems to be the method that is aligned with the highest protection of human health and the ecosystem; thus we support further analysis of this method. Further comments on EPA Method 1668 can be found in Appendix A.

In terms of public health and fish consumption, one proposal we'd like to make is that monies be set aside for fish tissue and sediment sampling. Testing for PCBs in fish is expensive, and unfortunately agencies like both Ecology and the Spokane Regional Health District cannot always afford this as needed. Given the cause and effect relationship to Kaiser's contamination and fish contamination in that stretch of the River, we think this would be a good bio-indicator of effectiveness of the Kaiser remediation effort.

It is alleged that of two trails of groundwater contamination called plumes, the larger one containing PCBs and originating in the Remelt area has not reached the Spokane River. We would like to see monitoring wells or lysimeters situated as such that would give better confidence of this claim. Until then, we are not convinced that PCBs are not making their way to the Spokane River from this plume. Furthermore, we would like to see more of an emphasis on removal as opposed to containment.

We are concerned with Kaiser's claim that PCBs will break down over time. Their claim is not a balanced assessment of the scientific literature and does not adequately present information on the difficulties in producing an environment suitable for degradation of PCBs by microorganisms. This is discussed in detail in the comment included as Appendix A. We encourage you to encourage Kaiser to conduct more studies and investigate more possible methods. For a major clean up like this, several pilot projects should occur to ensure the path forward is both thorough and effective.

Finally, we encourage Ecology to take its time on investigating the former West Discharge Ravine and former South Discharge Ravine. Because of the River's nature during high flows to back up to these ravines, and because of the presence of PCBs, we would like to see Ecology and Kaiser implement a plan to ensure utmost River protection.

We applaud Kaiser for the time and money it has spent thus far on getting us to this point, and we understand that these options come at higher costs to the company. Riverkeeper and The Lands Council feel that there is no dollar amount that accurately portrays how valuable the Spokane River, the Aquifer, and the health of this community is. We have reason to believe that this location, Kaiser Trentwood, is and should be the number one priority for legacy pollutant clean-up along the Spokane River. Given this level of importance, we can't stress enough how important it is that the highest level of technology and science be employed for clean~~n~~-up and removal of PCBs and other toxic materials from this location.

Given all of the energy and focus placed on the Task Force and other River cleanup efforts, now is the time to do it right. Thank you for the opportunity to comment and for the information and education you have made available to the public.

Sincerely,

Bart Mihailovich
Spokane Riverkeeper

Mike Petersen
The Lands Council

March 5, 2012

Comments on:
Draft Final Feasibility Study Report Kaiser Trentwood Facility
Spokane Valley, Washington
November 2011
Prepared by
ESC, LLC
Dr. Peter L. deFur, President
Henrico VA

Request for Comments

These comments were prepared at the request of the Spokane Riverkeeper to address issues concerning PCB contamination of the Kaiser Trentwood facility in Spokane WA. The administrative record for this site contains a substantial number of documents, all of which were noted, but this review focused on the Draft Final Feasibility Study report (November 2011). In addition, the following reference and background documents were consulted in order to further investigate the topic of PCB breakdown:

Abramowicz, D.A., 1995. Aerobic and Anaerobic PCB Biodegradation in the Environment. Environ. Health Perspectives, 103:97-99.

Bedard, D.L., et al., 2007. The Dehalococcoides Population in Sediment-Free Mixed Cultures Metabolically Dechlorinates the Commercial Polychlorinated Biphenyl Mixture Aroclor 1260. App. and Environ. Microbiology, 73:2513-2521.

Borja, J., et al., 2005. Polychlorinated Biphenyls and Their Biodegradation. Process Biochemistry, 40:1999-2013.

Furukawa, K., and H. Fujihara, 2008. Microbial Degradation of Polychlorinated Biphenyls: Biochemical and Molecular Features. J. of Bioscience and Bioengineering, 105:433-449.

Hart Crowser. Draft Final Feasibility Study Report Kaiser Trentwood Facility Spokane Valley, Washington Volume I. November 2011 2644-125.

Hart Crowser. Draft Final Feasibility Study Report Kaiser Trentwood Facility Spokane Valley, Washington Volume II Appendix F. November 2011 2644-125.

Quensen, J.F., et al., 1990. Dechlorination of Four Commercial Polychlorinated Biphenal Mixtures (Aroclors) by Anaerobic Microorganisms from Sediment. App. and Environ. Microbiology, 56:2360-2369.

Wu, Q,, et al., 1996. Influence of Incubation Temperature on the Microbial Reductive Dechlorination of 2,3,4,6-Tetrachlorobiphenyl in Two Freshwater Sediments. App. and Environ. Microbiology, 62:4174-4179.

The expertise in PCB toxicology, assessment and remediation is delineated in the attached CV and description of expertise. To summarize, I have worked on issues of PCB toxicology for more

than 20 years in several contexts- as dioxin-like compounds and with toxicity that is not dioxin-like. Through my consulting practice, for more than 16 years, I have reviewed and written technical reports on and investigated PCB contaminated Superfund sites, RCRA sites, state contaminated sites and PCB TMDLs, including those in Port Angeles, WA; Lower Duwamish River, WA; the Spokane River, WA; the Delaware River, DE; Housatonic River, MA; Hudson River, NY; Ward Transformer Site, NC; and others that are listed in the attached materials.

EPA Method 1668

EPA Method 1668A was published in 1999 and it was used to analyze environmental samples for the presence of chlorinated biphenyl congeners. The method can be used in wastewater, surface water, soil, sediment, biosolids and tissue matrices. Due to user suggestions and peer reviews, the method was revised in 2000 and 2003. Because 1668A was initially reviewed by a single lab, an interlaboratory validation study was conducted and a revised method was published – Method 1668B. Because 1668B has been validated across multiple labs and has been revised due to peer reviews, the method outcomes have a higher reliability than those utilizing 1668A. An addendum to the validation report, i.e. 1668B, created changes that prompted EPA to then accept these changes under Method 1668C (EPA 2010). Once approved, the method detection limit would be lower than previous methods, including Method 8082, which has a detection limit of 0.0045 micrograms/liter. A lower method detection limit allows for detection of much smaller concentrations of contaminant. With this ability, the regulatory and cleanup levels can be set at a lower, more protective concentration. The FS needs to state clearly that Method 1668B will be used to measure PCBs or if EPA approves Method 1668C, that method also may be used; Method 8082 is not good enough.

Biased information regarding PCB biodegradation

Biodegradation is one way in which PCBs (or other such organic compounds) may be broken down in the environment; the other pathways for PCB breakdown are physical (i.e. light) and chemical (acid or base), or a combination of physical-chemical. Biological degradation is almost entirely caused by microbial activity, by fungi or bacteria, where bacterial degradation is the most common. Some bacteria found naturally in some locations may be able to partly degrade some PCBs if the environmental conditions are appropriate. Some bacteria, for example, require oxygen, while other bacteria require anoxia and are poisoned by any oxygen. The conditions on which biodegradation depends are mentioned below.

Throughout the Feasibility Study, Appendix F is cited as the source of information, and support for, biodegradation of PCBs. Appendix F is not a balanced assessment of the scientific literature and does not adequately present information on the difficulties in producing an environment suitable for degradation of PCBs by microorganisms. Even despite the information found in

some of the cited articles that actually indicate the difficulty behind biodegradation of PCBs, Appendix F greatly downplays these aspects. For example, Borja et al. (2005) is one of the references for Appendix F and in the published article, the authors conclude that "The greatest challenge is in the bioremediation of PCB-contaminated sites. The complexity of the microbial processes responsible for degradation and the complexity of the compounds themselves make it difficult to degrade the compounds." Because there has not been a consistent, dependable outcome for biodegradation of PCBs across multiple contaminated sites, it cannot be called upon as a reliable remediation strategy.

Several factors are necessary for the dechlorination, or breakdown, of PCBs to occur by microorganisms. These include the presence or absence of oxygen (aerobic and anaerobic conditions, respectively), the concentration of PCBs present, the congeners of PCBs present, temperature, pH, salinity, as well as many other environmental conditions. The different types, or congeners, of PCBs that are present are particularly important. Highly chlorinated PCBs are slower to dechlorinate than less-chlorinated PCBs and require a different set of conditions for dechlorination to take place by microorganisms. The aerobic or anaerobic conditions are also important as they determine which microbes will be present. Microbes may only be able to survive in the complete absence of oxygen (obligate anaerobe) or only in the presence of oxygen (strict aerobe), and some may be able to survive in either (facultative). Even if a microbe has been found to degrade PCBs, the conditions must be right for that particular microbe to exist in that particular environment and come in contact with that PCB for degradation to occur. The environment and the contaminants found therein, as opposed to a controlled lab setting, are often imperfect in this regard.

Additionally, much of the scientific literature cited in this Appendix to support PCB biodegradation processes is predominately written by a few key authors. Many of these key authors are also found in the reference lists for each other's published articles (including: Abramowicz, Bedard, Furukawa, Quensen, Wu). This indicates that, in actuality, only a small number of scientists have conducted this research with these outcomes. Also, some of these authors have industry affiliations or have had funding from industry. For example, Abramowicz is affiliated with GE and Bedard has received funding from GE. These affiliations and connections to industry can call into question a bias that may be associated with their scientific findings.

Lacks appropriate citations and references

Appendix F.3 "Natural Attenuation of PCBs and PCBs Comingled with Petroleum" is poorly cited work. Several of the in-text citations (author's name, date published) are not found in the reference list at the end of Appendix F. These include: Strand 2008; Ogles et al. 2008; Lu 2006;

Hendrickson et al. 2002; Hazen 2009; Liefer 1983. The "Liefer 1983" citation is assumed to be a misspelling of Leifer, which is found in the list of references. However, the citation "Strand 2008" is cited five times to support the following claims: aerobic biodegradation of PCBs by 2,3-dioxygenase and metacleavage to form benzoates; and PCB degradation by fungi strains in cometabolic processes. Without proper references for these citations, other readers of this document cannot read the articles to determine their scientific validity and their appropriateness to this analysis. This degrades the credibility of this analysis and brings into question its thoroughness.

There are also references listed for Appendix F that are not actually cited anywhere in the text of Appendix F. These include:

"Abraham, W., et al., 2002. Polychlorinated Biphenyl-Degrading Microbial Communities in Soils and Sediments. Current Opinion in Microbiology, 5:246-253."

"Iwamoto, T., and M. Nasu, 2001. Current Bioremediation Practice and Perspective. J. of Bioscience and Bioeng. 92:1-8."

"LaJoie, C.A., et al., 1994. Cometabolic Oxidation of Polychlorinated Biphenyls in Soil with a Surfactant-Based Field Application Vector. App. and Environ. Microbiology, 60:2826-2833."

"Mikszewski, A., 2004. Emerging Technologies for the In-situ Remediation of PCB-Contaminated Soils and Sediments: Bioremediation and Nanoscale Zero-Valent Iron. EPA OSWER."

"Renner, R., 1998. Natural Remediation of DDT, PCBs Debated. Environ. Sci. and Technology, 32:360A-363A."

"Van Dort, H.M., and D.L. Bedard, 1991. Reductive ortho and meta Dechlorination of a Polychlorinated Biphenyl Congener by Anaerobic Microorganisms. App. and Environ. Microbiology, 57:1576-1578."

In addition, Appendix F.2 "Natural Attenuation of Petroleum at the Kaiser Facility" is also poorly cited. The only citations found in the text are Hart Crowser's own work (2009a, 2009b, 2010) and Ecology's Guidance on Remediation of Petroleum-Contaminated Ground Water by Natural Attenuation (2005). These are also not found in the References list at the end of Appendix F. The claim that "This assessment is based on published information on chemical, physical, and biological breakdown of petroleum" is incorrect. The scientific claims summarized in this section are not supported by any citations for scientific articles published in peer-reviewed scientific journals. Because there are no citations from the scientific literature, there is no indication that the scientific community agrees with these findings. The only support for the information given in this section is based on Hart Crowser's own monitoring data collected at

the site. This a significant shortcoming of this report that also calls into question the validity of the information presented.

Conclusions

The lack of supporting peer-reviewed scientific literature, as well as the improper citations and references, indicates a poorly executed and researched report. Additionally, because there has not been a consistent, dependable outcome for biodegradation of PCBs across multiple contaminated sites, it cannot be called upon as a reliable remediation strategy at the Kaiser Trentwood Facility.

References

Environmental Protection Agency. Addendum to the Method 1668A Interlaboratory Validation Study Report. March 2010. EPA-820-R-10-003.

Respectfully submitted,

Peter L. deFur, Ph.D.

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Curriculum Vitae – 2012

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EDUCATION:

Ph.D., Biology, The University of Calgary, Calgary, Alberta, Canada, 1980.
M.A., Biology, The College of William and Mary, Williamsburg, VA, 1977.
B.S., Biology, The College of William and Mary, Williamsburg, VA, 1972.

PROFESSIONAL EXPERIENCE:

President, Environmental Stewardship Concepts, 1996- present

Affiliate Associate Professor, Center for Environmental Studies, Virginia Commonwealth Univ., Richmond, Va., 1995-Present
Senior Consulting Expert to the EPA Superfund National Ombudsman Office, 2000- 2001.
Adjunct Senior Scientist, Environmental Defense Fund, Washington, DC.1996-1997
Senior Scientist, Environmental Defense Fund, Washington, DC., 1992-1996
Scientist, Virginia Office of the Environmental Defense Fund, Richmond, VA. 1990 -1991
AAAS Environmental Science Fellow, U.S Environmental Protection Agency, Washington, DC. June Aug 1989
Associate Professor, member of the Graduate faculty, Dept Biological Sciences, Southeastern Louisiana University, Hammond, LA. Aug 1988 _ Dec 1989
Visiting Investigator, Smithsonian Environmental Research Center, Edgewater,MD July 1987-Aug 1988
Assistant Professor, member of the Environmental Biology and Public Policy Faculty, Department of Biology, George Mason University, Fairfax, VA. September 1981-1988
Postdoctoral Fellow, Division of Physiology, Faculty of Medicine, University of Calgary, Calgary, Alberta, Canada. Sept 1980 - Aug 1981
Research Associate, Bamfield Marine Station, Bamfield, British Columbia, Canada. July - August 1980
Ph.D. Candidate, Department of Biology, The University of Calgary, Calgary, Alberta, Canada. 1977-80
Graduate Assistant, Dept of Biology, The College of William and Mary, Williamsburg, VA 1975-1977
Associate Research Scientist, Ecological Analysts, Inc., Baltimore, MD. 1974-1975
Assistant Research Scientist, Department of Geography and Environmental Engineering, The Johns Hopkins University, Baltimore, MD. 1972 - 1974

PROFESSIONAL ACTIVITIES:

Mid-Atlantic Fisheries Management Council, Virginia Obligatory appointee 2009-2012
Member, NAS/NRC committee on Uranium Mining in Virginia 2010-2011.
Chair, Public Affairs Committee of the Society for Integrative and Comparative Biology, 2008-2010
Chair, Advocacy Committee of the American Lung Association of Virginia, 2007-present
Member, State Advisory Board for Greenhouse Gases, Virginia Air Pollution Control Board. 2006-2007
Advocacy Committee, American Lung Association of Virginia, member since 1998
Member, Environmental Protection Agency SAB review panel on 3 MRA; 2003-2004
Member, NAS/NRC Panel to Review the Everglades Critical Ecosystems Science Initiative, 2002-2003
Member, Federal Advisory Committee to EPA: Endocrine Disruptor Methods Validation Subcommittee 2001-2003
President, Association for Science in the Public Interest, 1999-2002
Member, Board of Directors, Science and Environmental Health Network 1996- 2003
Chair of the Board of Directors, Science and Environmental Health Network, 1998-2000.
Member, Advisory Committee to the Board of the Coalition to Restore Coastal Louisiana, 2002-2005
Member, SETAC workshop on Uncertainty in Ecological Risks of Pesticides, February 2002, Pensacola
Member, NAS/NRC Study Committee on Agricultural Exotic Species, 1999-2001.
Member, Board of Directors, Coalition to Restore Coastal Louisiana, 1990 - 2001.
Member, National Academy of Sciences, National Research Council (NAS/NRC) Study Committee on Diisomethyl Propionate, 1999- 2000.
Member, Chemical Manufacturers Association Technical Implementation Panel on Human Health Exposure Assessment, 1999-2000.
Co-Chair, Peer Review of the EPA Dioxin Reassessment, Washington DC, July 2000.
Chair, Peer Review of the EPA Ecological Risk Assessment for PCBs in the Hudson River, Mar- June 2000.
Scientific chair, Society for Environmental Toxicology and Chemistry (SETAC) workshop on endocrine disruptors in invertebrates, 1997- 1999; workshop December 1998, Amsterdam.
Chair, Peer Review of EPA (ORD) Risk Characterization Handbook, Washington DC, March 1999.
Chair, Peer Review of EPA (OWOW) Water Quality Criteria Derivation Methodology for Human Health, Alexandria, VA May 1999.
Peer Reviewer of USDA ORACBA programmatic risk assessments, July 1999.
Chair, Peer Review of EPA (ORD) Research Program for Endocrine Disruptors, July 1997.
Member, Peer Review of EPA (ORD) Strategy for Determining Toxic Equivalency Factors for Dioxin in Wildlife, Chicago, IL January 1997.
Member, Endocrine Disruptor Screening and Testing Advisory Committee, official federal advisory committee to the EPA, 1996-1998.
Member, Board on Environmental Studies and Toxicology of the NAS/NRC, 1996-1999.
Steering Committee, SETAC workshop - Multiple Stressors in Ecological Risk Assessment, Sept 1997
Steering Committee, SETAC workshop -Reproductive and Developmental Toxicants in Oviparous Vertebrates July 1997
Steering Committee, SETAC workshop Ecological Risk Management Framework, June 1997
Member, Steering Committee for UN Environment Program workshop on a global assessment for Endocrine Disrupting Chemicals, 1996-7.
Chair, Ecological Subcommittee, Maryland Oyster Roundtable Steering Committee, 1994 -1996

Member, drafting team for the EPA dioxin reassessment, Chapter 9, 1996
Consultant, EPA Science Advisory Board, September 1992 - 1995.
Co-chair, Public Affairs Committee, Society for Integrative and Comparative Biology, 1995- 1996
Steering Committee, SETAC workshop, Ecological Risk Assessment Modeling System, May 1994-97
Member, Scientific Review Panel for EPA revision of the IRIS listing of the cancer dose-response potency for PCB mixtures; May, 1996.
NAS/NRC Committee on Risk Characterization, 1994 - 1996.
Member, Advisory Committee, and Affiliate Associate Professor, Center for Environmental Studies, Virginia Commonwealth University, Richmond, VA. 1993- 1996.
Member, Scientific Review panel, WTI Hazardous Waste Incinerator, January 1996
Co-Organizer, Symposium for American Society of Zoologists, December 1995; "Molecules to Mudflats: Biological Adaptations to Estuaries."
Member, Review Panel, EPA Ecological Risk Assessment National Guidance, Dec 1995
Steering Committee: Water Quality 2000; 1991 - 1995.
Toxic Constituents Challenge Group- Water Quality 2000; 1991.
Member, Maryland Oyster Roundtable, 1993-1994.
Co-organizer, "Biological Adaptations in Estuaries: from Molecules to Mudflats", symposium at the ERF biennial meeting, 1993, Hilton Head, SC
External invited reviewer, EPA Scientific Reassessment of Dioxin, 1992-93.
Member, U.S. EPA Science Advisory Board Ad Hoc Committee on the Great Lakes Water Quality Initiative, January 1992 - 1993.
Member, Steering Committee, EPA Wildlife Criteria Conference, Charlottesville, VA, April 12-15, 1992.
Member, Research Advisory Committee, Virginia Pesticide Control Board, 1991-1992.
Member, EPA Independent Panel to review Chesapeake Bay Program non-point source pollution program, 1990.
Member, Japanese Oyster Review Committee, Virginia Marine Resources Commission, 1990 - 1991.
Vice-President, Board of Directors, Virginia Conservation Network, 1994 - 1995.
Member, Board of Directors, Conservation Council of Virginia, 1992 - 1994.

External Reviewer, Ecotoxicology
Associate editor, Journal of Experimental Zoology, 1994-1996.
External reviewer, Physiological Zoology
External reviewer, Journal of Crustacean Biology
External reviewer, Biological Bulletin
External reviewer, Environmental Research

SELECTED FUNDING

Hudson River Sloop Clearwater, Technical Advisor for the PCB Cleanup of the Hudson River
Grec County Environmental Coalition Technical Advisor for Brunswick GA Superfund sites
TVA Kingston Fly Ash Release contaminated site, Technical Assistance Services for Communities grant for advisory services to the Roane County Community Advisory Group, November 2009-December 2009
Tittabawassee River, Saginaw River, & Saginaw Bay Contaminated Site, Technical Assistance Services for Communities grant for advisory services to Lone Tree Council, October 2009 – November 2009.

Pine River Superfund Site, Technical Advisor to Pine River Citizens Task Force (CAG), June 2009 – present.
Badger Army Ammunition Plant, Technical Advisor to the Restoration Advisory Board, 2009-10.
Portland Harbor Superfund Site, Technical Advisor for the Willamette Riverkeeper, September 2008-current.
Neuse River Foundation, Technical Assistance Grant for advisory services, 2007-current.
Virginia Department of Environmental Quality grant to VCU; 2007- 2008; "Health Risks from Methyl Mercury Contaminated Fish Consumption in Eastern Virginia," Principal Investigator
Center for Justice, Technical Assistance Grant for advisory services, 2005-current.
Clean Water Action Council, Technical Assistant Grant for advisory services, 2006-current.
Citizens for Safe Water Around Badger, Technical Assistant Grant for advisory services, 2004-current.
Delaware River Basin Commission, Contract to provide technical services on the TMDL for PCBs, 2004-current.
Fort Ord Environmental Justice Network Technical Assistant Grant for advisory services, 2004–current.
Spring Valley RAB Technical Assistance Grant for advisory services, 2002-current.
Housatonic River Initiative Technical Assistance Grant for advisory services, 2002-current.
Lower Duwamish River Group, Technical Assistance Grant for advisory services, 2002-current.
Olympic Environmental Council, Public Participation grant for technical services, 1999- 2000 and 2001-current.
Indiana Department of Environmental Management to PL deFur, 2001-2003, technical services, $75,000
World Wildlife Fund to P L deFur for Endocrine Disruptor Screening and Testing workgroup 1999
Starfire Fund award to VCU, 1996-1997.
W.A. Jones Foundation grant to VCU, 1996-1997; 1997-98
C.S. Mott Foundation grant to EDF, 1994-1996.
Bauman Foundation grant to EDF, 1994, 1995.
Healy Foundation grant to EDF, 1993.
Beirne Carter Foundation grant to EDF, 1991.
Virginia Sea Grant, Investigator Initiated Research, 1987-90.
Jeffress Foundation grant, 1986-7.

RECENT RESEARCH PROJECTS

Environmental Policy for hormone disrupting chemicals in the environment
Assessing environmental endocrine disruptors in aquatic systems
Effects of medical waste disposal practices on human and environmental health
Effects of hormone disrupting chemicals on children's health
Coastal eutrophication in U.S. waters—distribution and impacts.
Review of the EPA reassessment of the health and environmental risks of dioxin and related compounds, and development of policy recommendations, 1991 - Present.
Examination of federal policies and practice of risk assessment, 1993 - Present.
Mapping environmental contaminants in the Arctic; EDF research project, 1994.
Impacts and control of non-native species in aquatic ecosystems, 1991 - Present.
Effects of low oxygen (hypoxia) and anoxia on aquatic organisms of the Chesapeake Bay, 1982 - 1988.
Research on the effects of environmental variations on estuarine invertebrates in Chesapeake Bay.

TESTIMONY

Expert Witness for Edison Wetlands Association, Inc vs Akzo Nobel Chemical, Inc in the New Jersey State Court, 2009-2010.
Expert Witness for Gonye v. Toll Bros. in the Delaware State Court, 2008
Expert for NRDC concerning maintenance dredging in Newark Bay, 2005
Expert witness, state appeal for DuPont/Delisle air permits. Mississippi, 2004.
Expert witness, state hearing on Chemical Weapons Incinerator, Umatilla OR, November 2002
Expert witness, federal hearing on the Chemical Weapons Incinerator at Tooele, Utah regarding risk assessment for emissions from incinerator; July 1996; September 1999.
The NOAA Budget: Research and Program Needs and Priorities. Testimony of the Environmental Defense Fund before the House Subcommittee on Fisheries, House Merchant Marine and Fisheries Committee, March 1994.
Risk Assessment at EPA, with comments on H.R 2910. Testimony before the House Subcommittee on Transportation and Hazardous Materials of the Energy and Commerce Committee, November 1993.
Research Needs in the Clean Water Act Reauthorization, H.R. 1116. Testimony before the House Subcommittee on Technology, Environment and Aviation of the Science and Technology Committee, Sept. 1993.
Environmental and ecological impacts of dioxin discharged in pulp mill effluent. Testimony before the Maine Board of Environmental Protection, November 1992.
National Water Quality Standards for Dioxin and H.R. 2084. Testimony before the Water Resources Subcommittee of the House Committee on Public Works and Transportation, May 1991.
Wetland Restoration as Part of the Corps Reauthorization Bill. Testimony before the Water Resources Subcommittee of the House Committee on Public Works and Transportation, June 1990.
Expert witness on Biology and Crustacean Biology before the Louisiana state court re: Shell dredging in Lake Pontchartrain, October 1989.

PROFESSIONAL SOCIETIES:

International Association of Facilitators
Society for Integrative and Comparative Biology (formerly American Society of Zoologists)
Society of Environmental Toxicology and Chemistry
Atlantic Estuarine Research Society
Estuarine Research Federation

Professional Service:

Steering Committees for SETAC workshops on Invertebrate Endocrine Disruptors Multiple Stressors; Reproductive and Developmental Toxicity of Oviparous Vertebrates; Ecological Risk Management
Public Affairs Committee of SICB/ASZ, 1993 – 1997 and 2008 - 2010
Organizer, ASZ symposium: Molecules to Mudflats: Biological Adaptations in Estuaries.
Co-organizer of ASZ symposium on Environmental Endocrine Disrupters, January 1995
Member of SETAC Pellston workshop on ecological risk decisions
Organizer of Estuarine Research Federation symposium on Coastal Hypoxia, November 1993

COURSES TAUGHT:

Undergraduate

Introductory Zoology
General Physiology: lecture and lab
Animal Physiology: lecture and lab
Scientific Thought and Process (for non_majors)
Human Anatomy and Physiology (for non-majors)
Special Skills in the Life Sciences: "Introduction to Teaching Neuromuscular Physiology"
Human Physiology

Graduate

Physiology of Animals in Polluted Habitats
Survey of Environmental Studies
Ecological Risk Assessment
Physiological Ecology
Seminar in Environmental Biology
"Environmental Justice"
"The Evolution from Water to Land"
"Acid_base Balance of Body Fluids"
Environmental Physiology
Comparative Animal Physiology
Environmental Toxicology – Endocrine Disruptors; jointly with Dr. J. Rosecrans

GRADUATE STUDENTS:

Thesis Director, James Martin: VCU, "Effects of Hypercapnic Hypoxia on Freshwater Blue Crabs," May 2009.
Thesis Director for Carrie Fehl Hagin, Virginia Commonwealth Univ.
Thesis director for Lisa Foersom,, thesis title: "Effects of Endosulfan on Molting in Juvenile Red Swamp Crayfish, *Procambarus clarki.*" May 2001,Virginia Commonwealth Univ.
Thesis director for Mark Huff, thesis title: "Alternatives to the Use of Risk Assessment in Environmental Management: Application to Medical Waste." December 2000. Virginia Commonwealth Univ.
Thesis director for Rene Hypes, thesis title: "Effects of Hypoxia and Hypercapnia on Blue Crabs, *Callinectes sapidus*, in the York River, Virginia." December 1999. Virginia Commonwealth Univ.
Thesis director for Anita Pease, title: "Effects of Long Term Hypoxia on Respiration in blue crabs, Callinectes sapidus." May 1988. George Mason Univ.
Dissertation director for Les Touart, title: "Effects of Insect Growth Regulators on Aquatic Crustaceans." 1987-1988. George Mason Univ.
Thesis director for Nancy Patterson, thesis title "Effects of Acid Rain on Red Swamp Crayfish, *Procambarus clarki.*" May 1984 George Mason Univ.

HONORS AND AWARDS:

AAAS Environmental Science and Engineering Fellowship, June - August 1989.Tri Beta (GMU Chapter), Faculty Award 1986.

The Crustacean Society: 1985 Outstanding Paper Award.
American Society of Zoologists Travel Award, First International Congress of Comparative Physiology and Biochemistry, Liege, Belgium, 1984.
Alberta Heritage Foundation for Medical Research Postdoctoral Fellowship, Sept 1980 - Aug 1981.
University of Calgary Dissertation Fellowship, 1980 - 1981.
Province of Alberta Graduate Scholarship: May 1979 - April 1980.
Province of Alberta Graduate Scholarship: January - April 1979.

PUBLICATIONS:

P.L. deFur, G.W. Evans, E.A.C. Hubal, A.D. Kyle, R.A. Morello-Frosch, and D.R. Williams. 2007. Vulnerability as a function of individual and group resources in cumulative risk assessment. Environmental Health Perspectives. 115(5):817-824.

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INVITED SEMINARS AND PRESENTATIONS:

"Communicating Science" Panel Discussion, Fort Johnson Seminar Series. College of Charleston; Charleston, SC. April 6, 2007.
"Vulnerability as a Function of Individual and Group Resources in Cumulative Risk Assessment" Poster Presenter. National Council for Science and the Environment's 7th National Conference on Science, Policy, and the Environment: Integrating Environment and Health. Washington, D.C. February 1-2, 2007.
"Global Warming: An Uncertain Future" invited speaker to the Jewish Community Center of Richmond, Virginia's 5400 Men's Club, January 22, 2007.
deFur, P.L. "Importance of Invertebrate Models for EDCs in the Field" Society for Integrative and Comparative Biology 2003 Annual Meeting and Exhibition. January 5 – 9 2004.
"Risks of PCBs to Wildlife," invited speaker at the PCB Congress held March 26-27, 2003 Fairfield Univ., Fairfield CT
DeFur, P.L.; Foersom, L.L.; Tuberty, S. "Effects of the pesticide endosulfan on molting in juvenile red swamp crayfish *Procambarus clarkii*. Society for Integrative and Comparative Biology 2003 Annual Meeting and Exhibition. January 4 – 8, 2003.
"Endocrine Disruptors in Aquatic Crustaceans." Invited seminar at Virginia Institute of Marine Sciences, February 2003.
"Safe Handling and Disposal of Medical Waste." Presentation at "Occupational and Environmental Health and Safety Issues in the Health Care Sector" seminar, Harbor Hospital, Baltimore MD, September 25, 2001.
"An Environmental Scientist's Perspective on the Precautionary Principle" presentation at the EPA Toxicology and Risk Assessment Seminar; Dayton OH, April 24-5, 2001.
"US Policies and Perspectives." Presentation at the University of Iowa workshop on Endocrine Disruptors and Pharmaceutically Active Agents in Drinking Water. Chicago, IL; April 19-21, 2000.
"An Environmental Scientist's Perspective on the Precautionary Principle." Presentation to the National Toxicology Forum, February 2000, Washington DC.
"Medical Waste: Where's The Harm?" Presentation to the Fall meeting of the Richmond Academy of Medicine, November 1999.
"Achieving a Toxics Free Bay- The Role of Point Sources", NGO perspective. Panel Discussion at EPA

Chesapeake Bay Forum, Aberdeen, MD. June 22, 1999
"Can What We Don't Know Hurt Us? Toxic chemicals in the Chesapeake Bay." Invited Symposium at Johns Hopkins University, Baltimore, MD, Nov 13, 1998.
"Environmental Endocrine Disruptors: Fact and Fantasy"; seminar to Department of Biology, College of William and Mary, October, 1998.
"Environmental Risks to Children's Health," Society for Risk Analysis symposium, Williamsburg, VA; October 1998.
"Risk Assessment from the Perspective of the NGO Community." Panel presentation to the Symposium on Toxicology and Risk Assessment, National Library Medicine, May 14-16, 1997 presented by US Army Chemical and Biological Defense Command, Edgewood Arsenal.
"An NGO Perspective on Risk Assessment". Briefing for Congressional staff, January 1997, organized by the American Chemical Society, as part of the Risk Education Project.
"Stakeholder Participation: Improving Decision Making for Risk Assessment and Risk Management". Panel presentation, annual meeting of the American Industrial Health Council, Washington, DC, December 1996.
"The Return of Silent Spring?" Convocation lecture to Roanoke College, Salem Virginia, March 1996.
"An Environmental Perspective on the EPA Dioxin Reassessment". Risk Assessment 1995, Symposium Presentation, Oct 17-18, 1995, Inside Washington Publishers
"Science, Policy and Ecological Risk Assessment". Environmental Science Seminar Series, University of Virginia, September 1995.
"Policies and Regulations for Endocrine Disrupting Pesticides". Panel presentation to the annual meeting of Investigative Reporters and Editors, June 1995, Miami, Fl
"The Role of Scientists in Federal Environmental Policy: Lessons from Risk Assessment". Seminar to Oregon Inst. Mar. Biol., Charleston, OR, April 1995.
"Ecological Risk Assessment in the Chesapeake Bay". Seminar to the Darden School of Business, The Executive Program, Univ. Virginia, June 1995.
"Risk-based Decision Making: Is Risk Assessment Elitist?" Panel presentation to USAID, Washington, DC, March 15, 1994.
"The Environmental Community Perspective on Environmental and Occupational Cancer". NIEHS Environmental Justice Symposium, Crystal City, VA, February 10 - 12, 1994.
"The Toxicological Basis for Risk Assessment and the Cost of Regulation in EPA", presentation before the National Academy of Sciences, Board on Environment, Science and Technology, Washington, DC, December, 1993.
"Systemic Responses of Estuarine Invertebrates to Hypoxia," Estuarine Research Federation meeting, Hilton head, SC, November, 1993
"Risk Assessment in the 1990's: Lessons from Dioxin", seminar to the Medical University of South Carolina, November 1993.
"Reassessment of the Health and Environmental Risks of Dioxin", seminar to Eastern Connecticut State University, October 1993.
"Environmental Activities: Prospective on Environmental Policy - Making Decisions in the Face of Uncertainty". Office of Personnel Management Training Panel, Denver, CO, July 1993.
"Responses of Aquatic Animals to Hypoxia in the Chesapeake Bay", seminar to the Department of Biology, Virginia Commonwealth University, January 1993.
"An Environmentalist Perspective on On-Site Oil Spill Clean Up", panel presentation to Coast Guard Class, December 1992.

"Physiological Responses of Blue Crabs to Long Term Hypoxia", seminar to the Department of Biology, George Washington University, October 1992.
"EPA's New Directions: Recommendations from the Environmental Community", panel presentation to the EPA annual meeting on Water Quality Standards, September 1992.
"The Role of Science in Environmental Regulation and Policy", seminar to the College of Charleston, Environmental Studies Program, October 1991.
"Wetland Values, Functions and Regulations in 1991", invited lecture at Virginia Commonwealth University, Department of Urban Studies, October 1991.
"How Much Is the Wetland in Your Back Yard Worth?," College lecture series at Randolph Macon College, September 1991.
"Public Participation in Long Term Management of Sediments Decision-making Processes", presentation at LTMS National Workshop, Baltimore MD, February 1991.
"Molting in Blue Crabs: Physiological Adaptations to Low Salinity and Low Oxygen Environments," Seminar at Department of Biology, University of New Orleans, October 1989.
"Physiological Adaptations to Estuarine Habitats," seminar given to the Department of Biological Sciences, Mississippi State University, February 1989.
"Systemic Limitations to Gas Transport in Invertebrates," invited speaker at the fall meeting of American Physiological Society, October 1987.

ABSTRACTS and PRESENTATIONS:

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Martin, J.T., deFur, P. L. The Responses of Blue Crabs (Callinectes Sapidus) to Fresh Water Hypoxia. AERS Oct. 2008.
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P.L. deFur and S.R. Hypes, R. 1999. Effects of hypoxia/hypercapnia on *Callinectes sapidus* in the York River, VA. Am Zool. 39: 60A (Abs.)
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Hypes, R and P.L. deFur. 1999. Effects of hypoxia/hypercapnia on *Callinectes sapidus* in the York River, VA. Annual meeting AERS: Gloucester Pt., VA; 23-25 April 1999.
Hypes, R. and P.L. deFur. 1998. Effects of hypoxia and hypercapnia on blue crabs in an estuary of the Chesapeake Bay. Am. Zool. 38: 432 Abs.
deFur, P.L. and C. Borgert 1998. Communications and outreach workgroup in the EDSTAC process. SETAC annual meeting, Nov., 1998, Charlotte, NC
deFur, P.L. and C. Fehl. 1998. Pfeisteria hysteria in the Chesapeake Bay in 1997. SETAC annual meeting, Nov., 1998, Charlotte, NC
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meeting, Nov., 1997, San Francisco, CA.
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deFur, P.L. 1995. Policy and Regulations for Control of Exotic Species Introductions. Panel presentation to annual meeting of Amer. Soc. Zool., St. Louis, MO
deFur, P.L. 1993. Respiratory responses of blue crabs, Callinectes sapidus, to ambient hypoxia. Am. Zool. vol. 33: 61A.
deFur, P.L. 1993. Physiological responses of aquatic animals to persistent ambient hypoxia. Estuarine Research Federation Annual Meeting, November 1993.
deFur, P.L. 1992. Ambient hypoxia limits biodiversity in estuarine and coastal habitats. Am. Zool. 32: abs.
deFur, P.L. 1991. Human health and environmental threats due to dioxin exposure in ambient water. AAAS annual meeting, Washington, DC.
deFur, P.L. 1991. Water quality standards for dioxin are not protective of human health or the environment. Advances in Chesapeake Bay Research, 1991. CRC, P.O. Box 1280, Solomons, MD.
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Reiber, C.L., P.L. deFur and G.F. Birchard. 1988. Temperature sensitivity of oxygen uptake in the forest land crab, Stoliczia abbotti. 2nd Internat. Congres. Comp. Physiol. Biochem., LSU, Baton Rouge, LA.
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Booth, C.E., A.W. Pinder, P.L. deFur and B.R. McMahon. 1980. Oxygen uptake and transport during swimming in the blue crab, Callinectes sapidus. Can. Soc. Zool. Ann. Meeting.
Wilkes, P.R.H., P.L. deFur, and B.R. McMahon. 1980. A new mathematical description of crustacean acid_base status. Can. Soc. Zool. Ann. Meeting.
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COMMENTS RECEIVED OUTSIDE (BEFORE AND AFTER) THE JANUARY 5 THROUGH MARCH 6, 2012 PUBLIC COMMENT PERIOD

I Support Kaiser's Remediation Plan and the Proposed Alternatives

I support Kaiser's recommended overall remediation plan for soil and groundwater at the Trentwood site. Specifically, I support the recommended alternatives for:

- Removal and capping of contaminated soil
- Continued containment of groundwater impacted by oils
- Expansion of removal systems for oils on groundwater
- Containment system for groundwater PCB contamination

I urge your selection of Kaiser's remediation plan and the recommended alternatives.

Name Thena Brown

Address 4115 E Trent
Spokane WA 99202

Signature Thena Brown

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Name KEVIN JONES

Address 15013 E. SHEAR CT
VERADALE WA 99037

Signature

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Name Rose Jones

Address 15013 E Shelly Ct
Veradale, WA 990

Signature

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Name Lisa Kinsey

Address 9503 E Montgomery Ave
Spokane, WA 99206

Signature Lisa Kinsey

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Name Allan Roy

Address 4308 S. Conklin Rd
Greenacres WA 99016

Signature Allan S. Roy

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Name Craig Turner

Address 11622 N. Sunnydale.
Nine Mile Falls, WA 99026

Signature

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I urge your selection of Kaiser's remediation plan and the recommended alternatives.

Name Ryan Conley

Address 4115 E. Trent Ave.
Spokane, WA 99202

Signature Ryan Conley

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I urge your selection of Kaiser's remediation plan and the recommended alternatives.

Name Ted Flint

Address 1915 E. 38th
Spokane, WA 99203

Signature

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Name Larry Wernicke

Address N 3817 Watch Rd.
Deer Park WA 99006

Signature

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Name John E. Sage

Address 8423 E. South Riverway Ave.
Spokane, WA 99212

Signature John E Sage

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I urge your selection of Kaiser's remediation plan and the recommended alternatives.

Name Tray Daniels

Address Box 976
Chewelah, WA 99109

Signature Tray Daniels

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Name Wade Grandlund

Address 3211 S. Arthur
Spokane, WA 99203

Signature Wade Grandlund

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Name Mary Lynn Boardman

Address 1221 W Railroad Alley Ave #17
Spokane WA 9920

Signature Mary Lynn Boardman

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I urge your selection of Kaiser's remediation plan and the recommended alternatives.

Name BARB BRINCKEN

Address 3710 S. WOODRUFF RD.
SPOKANE VALLEY, WA 99206

Signature Barb Brincken

I Support Kaiser's R
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I urge your selection of Kaiser's remediation plan and the recommended alternatives.

Name STEVE DAVIS

Address 1725 E. FINCH ROAD
HAYDEN LAKE ID 83835

Signature Steve Davis

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I urge your selection of Kaiser's remediation plan and the recommended alternatives.

Name Lisa Kinsel

Address 6117 E 11th Ave
Spokane Valley, WA 99212

Signature Lisa Kinsel

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Name Jessica Ryse

Address 9503 E. Montgomery Ave
Spokane Valley, WA 99206

Signature Jessica Ryse

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I urge your selection of Kaiser's remediation plan and the recommended alternatives.

Name Dave Vasquez

Address 2415 S. Steen Rd.
Spokane Valley, WA 99037

Signature Dave

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Name Kristy VanSkiver

Address 3610 S. Vercler Dr
Spokane Valley, WA 99206

Signature Kristy VanSkiver

MAR 18 2012
DEPARTMENT OF ECOLOGY
EASTERN REGIONAL OFFICE

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I urge your selection of Kaiser's remediation plan and the recommended alternatives.

Name Jacqueline Witter

Address 1102 S. Woodfern St.
Spokane, WA 99202

Signature Jacqueline Witter

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I urge your selection of Kaiser's remediation plan and the recommended alternatives.

Name Sheena Boston

Address 3408 E. Appleway
Chattaroy, WA 99003

Signature Sheena Boston

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I urge your selection of Kaiser's remediation plan and the recommended alternatives.

Name Elliot Davidson

Address 23310 E Inlet Dr #22

Liberty Lake WA 99019

Signature

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Name Renee LaRocca

Address 1701 E 20th Ave

Spokane, WA 99203

Signature

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Name Larry Schroeder

Address 10211 Genevieve Ln

Newman Lake WA 9902...

Signature

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Name Betsy J. Wallace

Address 10915 S. Welcome Rd
Medical Lake WA 99022

Physical no mail

Signature Betsy J Wallace

Mailing address: PO Box 17
FOUR Lakes, WA 99014

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I urge your selection of Kaiser's remediation plan and the recommended alternatives.

Name JEFF GIBSON

Address E. 8905 S. RIVERWAY
SPOKANE WA 99212

Signature

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DEPARTMENT OF ECOLOGY
EASTERN REGIONAL OFFICE

Name Elizabeth Schroeder

Address 10211 Genevieve Ln
Newman Lake, WA 99025

Signature

Bala, Teresita F. (ECY)

From: Don Ting [dontin@pyrotek-inc.com]
Sent: Wednesday, March 07, 2012 11:07 PM
To: Bala, Teresita F. (ECY)
Cc: Lisa Kinsey
Subject: Letter re Kaiser T-wood

Dear Ms. Bala,

As a resident of Spokane where my family and business reside, I wanted to share my gratitude and confidence in how the Department of Ecology and Kaiser Aluminum are tackling the environmental issues on theTrentwood site. I had no idea of the issues facing Trentwood prior to the Public Meeting. I am impressed with the extent and thoroughness of the evaluation. In particular, I am grateful for the special attention devoted to PCB and petroleum containment and removal.

I am also the COO of Pyrotek, an industrial manufacturer of engineered products and a supplier to Kaiser for over 50 years. I trust that Kaiser will fulfill their responsibilities as corporate citizens in a conscientious manner with all the resources they have at their disposal. Many of their managers have lived in Spokane for decades and have extended family living here as well. They drink from the same aquifer and enjoy recreating on the Spokane River like we do. I am sure they all have a strong vested interest in doing the right thing for protecting the environment for themselves and their grandchildren. I can also share that in 50 years of doing business with Kaiser, they have always acted ethically and responsibly.

Thank you for your efforts in resolving these environmental challenges. We appreciate how closely Ecology and Kaiser are working together to bring solutions to Spokane. We look forward to hearing of the progress you will make. If you would like any further input, please don't hesitate to call.

Sincerely,

Don Ting

Don Ting | COO/EVP | Pyrotek Inc., 9503 E. Montgomery Ave., Spokane Valley, WA 99206 | P: 509.340.2881 | F: 509.927.2408

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III. ECOLOGY'S RESPONSES TO COMMENTS RECEIVED DURING THE PUBLIC COMMENT PERIOD

I. Ecology received comments from several citizens and businesses who expressed support for Kaiser's recommended alternatives in the FS:

"I support Kaiser's recommended overall remediation plan for soil and groundwater at the Trentwood Site. Specifically, I support the recommended alternatives for:

- *Removal and capping of contaminated soil*
- *Continued containment of groundwater impacted by oils*
- *Expansion of removal systems for oils on groundwater*
- *Containment system for groundwater PCB contamination.*

*I urge your selection of Kaiser's remediation plan and the recommended alternatives." (**78 post cards, pages IIA-1 to IIA-23 of attached comments**)*

*"I support the overall recommended remediation plan for the soil and groundwater including recommended alternatives. This is a strong and balanced approach to ensuring environmental protection." (**Matthew Ewers, IEDS, page IIA-24 of attached comments**)*

*"We have reviewed Kaiser's recommended alternatives for continued protection of this resource and support their approaches to site clean-up and river protection. We view these alternatives as the appropriate level of investment for the stewardship of these resources." (**David T. Ruff, Craig Lee, Traci Hanegan, Tom Arnold, Phil Pintor, Coffman Engineers, page IIA-25 of attached comments**)*

*"I support the recommended alternatives for cleanup at the site and the protection of the river and its surroundings. The approaches used I found to be sensible and balanced." (**Dave Smith, Kaman Industrial Technologies, page IIA-26 of attached comments**)*

*"With this letter, I want to express my strong support for the recommended soil and groundwater cleanup alternatives, which are contained in the referenced feasibility study. They are pragmatic approaches which, if implemented, should address impacts to the environment that would occur or continue without such cleanup operations." (**James B. Harakas, GeoEngineers. page IIA-27 of attached comments**)*

*"We support the recommended alternatives for the soil and groundwater contained in the Feasibility Study. They are sensible and balanced approaches for cleaning up the site and protecting the Spokane River." (**Eldonna Shaw, Greater Spokane Valley Chamber of Commerce, page IIA-28 of attached comments**)*

"...I write today in support of Kaiser Trentwood's remediation plan and the recommended alternatives and ask that you support these alternatives when drafting the Cleanup Action Plan.

As you know, many of the environmental concerns with the Trentwood plant lie in legacy, and not on going, contamination issues. Kaiser's historical, discontinued use of PCBs is currently being addressed and the necessary steps to remediate the existing contamination and to halt further pollution are constant. Specifically, I support the recommended alternatives for removing and capping contaminated soil, continued containment of affected groundwater and removal of oil on groundwater." ***(Eric Williams, page IIA-33 of attached comments)***

Ecology's Response: Ecology makes note of your support for the recommended alternatives. Ecology will choose site remedies in the draft Cleanup Action Plan (CAP) according to the selection criteria under MTCA.

Based on the information presented in the FS, Ecology has determined there is sufficient information, at this point, to evaluate and determine Kaiser's recommended alternatives for soils and petroleum in groundwater meet MTCA's criteria for the selection of cleanup actions. However, Ecology has determined additional information will be needed in order to evaluate Kaiser's recommended "containment system for groundwater PCB contamination". At this time, this recommended remedy cannot be considered as a final action based on the discussions below.

Kaiser's recommended remedy for the groundwater PCB contamination, **presented as Alternative D2 in the FS Report**, is as follows:

> Contain the Remelt PCB plume by pumping and capturing the contaminated water near the leading edge of the plume and reinfiltrating this extracted water into the Oil House Area where current interim remedial measures are containing the petroleum contamination. The PCBs are expected to be contained by the existing interim remedial system in the Oil House area where PCBs will be adsorbed or sequestered by the petroleum and attenuated by natural degradation. In the event the PCBs will not be contained in the Oil House area, a downgradient containment system in the Wastewater Treatment area is expected to provide additional containment.

The current interim remedial measures in place in the Oil House Area provide containment to the petroleum contamination through hydraulic containment (pumping of clean water from the deep aquifer to create a zone of depression) and natural biodegradation of the petroleum. Site data show natural biodegradation of the petroleum is a significant component in the containment of the petroleum groundwater plumes. However, there is not sufficient evidence that PCBs are naturally biodegrading at the Site, as anticipated in Kaiser's recommended alternative. Ecology has not accepted the literature citations provided by Kaiser in the FS as confirmation of PCBs biodegrading at the Site.

In order to evaluate the Alternatives presented in the FS for PCBs in groundwater, including Kaiser's recommended remedy, Ecology will need the following information:

- Evidence of PCBs naturally biodegrading at the Site and, if biodegradation is occurring, the rate of degradation.
- The feasibility or practicability of treating the PCBs in groundwater extracted from the remelt plume using filtration and carbon adsorption.

In 2004 and 2005, Kaiser conducted laboratory studies using groundwater from the remelt plume and tested for removal efficiencies using coagulation/flocculation, filtration and carbon adsorption. These laboratory studies showed promising results in the removal of the PCBs in groundwater. Ecology will be requiring a pilot study be performed to show the feasibility of treating the PCBs in groundwater using this method. This treatment process is presented as Alternatives D3 and D4 in the FS Report.

Under MTCA, **treatment** is preferred over **containment** for long-term effectiveness. See WAC 173-340-360(3)(e)(iv). Therefore, Ecology will need information on whether treatment of PCBs in the extracted water is practicable or not. It has to be demonstrated treatment is impracticable for containment to be the only practicable remedy for the PCBs in groundwater.

Thus, Ecology will require Kaiser to conduct treatability studies and/or pilot studies in order to obtain the additional information needed. These treatability studies/pilot studies will be conducted together with other upcoming interim actions. The selection of cleanup actions in the draft CAP will occur after this data gathering for PCBs.

The draft final FS Report already provides for the conduct of pilot studies and treatability studies discussed above.

II. Several of the letters also refer to Kaiser's completed environmental work and commitment to continue cleaning up the site.

"Recently, I was invited to tour the facility in Spokane Valley and was impressed with the amount of environmental work already completed at the site. It is obvious that Kaiser is committed to cleaning up the 70+ year old site and protecting the Spokane River by providing the proper resources to test and remedy the situation." ***(Matthew Ewers, IEDS, page IIA-24 of attached comments)***

"Although we have had only a minimal involvement with the environmental remediation projects that Kaiser has engaged in (and no involvement in the development of the current alternatives) we are very aware of the significant efforts that Kaiser has made in this regard. Recently, we toured their facility and were reminded of the strides that Kaiser has made to protect our groundwater. As engineers we stand committed to the health of our environment and especially our aquifer and Spokane River. We are grateful to have a corporate citizen like Kaiser that is taking its care seriously." ***(David T. Ruff, Craig Lee, Traci Hanegan, Tom Arnold, Phil Pintor, Coffman Engineers, page IIA-25 of attached comments)***

"I was invited to see first hand the steps taken to do environmental cleanup at the Kaiser Trentwood site. I am impressed with the amount, and thoroughness of the work already completed. They have identified what need to be done to cleanup the site and how to maintain good practices." ***(Dave Smith, Kaman Industrial Technologies, page IIA-26 of the attached comments)***

"Frankly, I was very impressed with the extent of environmental cleanup work Kaiser has accomplished in recent years. I also was very interested to learn of the assessment work Kaiser has completed delineating cleanup work, which is yet to be completed." ***(James B. Harakas, GeoEngineers, page IIA-27 of attached comments)***

"Recently I and other members of our Board had the opportunity to tour the Kaiser site and were very impressed with the amount of environmental cleanup work already completed as a part of extensive renovations to the plant site. They have been very thorough and have created a state of the art manufacturing plant with great attention to detail toward use of natural resources. They have installed a very effective water filtration system. I was impressed with that they have done to identify problems created by past manufacturing practices. When the plant was built in the early 1940's, much was unknown throughout business and industry about the effects of contaminants. By utilizing current scientific knowledge, they are taking measures to correct past and prevent future problems." ***(Eldonna Shaw, Greater Spokane Valley Chamber of Commerce, page IIA-28 of attached comments.)***

"As a resident of Spokane where my family and business reside, I wanted to share my gratitude and confidence in how the Department of Ecology and Kaiser Aluminum are tackling the environmental issues on the Trentwood Site. I had no idea of the issues facing Trentwood prior to the Public Meeting. I am impressed with the extent and thoroughness of the evaluation. In particular, I am grateful for the special attention devoted to the PCB and petroleum containment and removal.

I am also the COO of Pyrotek, an industrial manufacturer of engineered products and a supplier for Kaiser for over 50 years. I trust that Kaiser will fulfill their responsibilities as corporate citizens in a conscientious manner with all the resources they have at their disposal. Many of their managers have lived in Spokane for decades and have extended family living here as well. They drink from the same aquifer and enjoy recreating on the Spokane River like we do. I am sure that they all have a strong vested interest in doing the right thing for protecting the environment for themselves and their grandchildren. I can also share that in 50 years of doing business with Kaiser, they have always acted ethically and responsibly." ***(Don Z. Ting, COO/EVP, Pyrotek, Page IIA-29 of attached comments)***

Ecology's Response: Kaiser has been working with Ecology to address environmental issues resulting from historical releases. Since 2005, Kaiser has conducted investigations and cleanup of soils and groundwater under the authority of the state's cleanup regulation, the Model Toxics Control Act (MTCA). Ecology is very appreciative of Kaiser's cooperation and the amount of work that Kaiser has done to address the contamination at the Site. However, more work has to be done to take care of residual contamination at the Site that still exceeds state standards. Ecology's responsibility is to make sure that remedial alternatives selected for this Site meet all the requirements of MTCA in order to protect human health and the environment.

Groundwater from the Kaiser Site discharges to the Spokane River, which is currently under a fish advisory for PCBs. Because of the nature of PCBs and their effect on the Spokane River, Ecology must ensure the remedy is fully compliant with the MTCA regulations that will be protective of human health and the environment, including the Spokane River.

III. Several letters also pointed out the economic contribution of Kaiser on the community.

"Kaiser Aluminum is an important manufacturing company within our community providing high paying jobs with exceptional benefits. In addition to Kaiser's investment in the environmental cleanup, they have recently invested over $100 million in the plant, thereby solidifying their presence in the area. These investments allow them to provide a high quality product at a faster lead time and meet the demand from aerospace companies located all over the 'word'.

*In addition, there are several suppliers to Kaiser operating in the Spokane and Coeur d'Alene region benefiting from this company's success. In fact, there are over 300 local suppliers generating at least $100k per year in revenue from Kaiser. Exporting product produced in Spokane increases our local economy and our standard of living." (**Matthew Ewers, IEDS, pages IIA-24 of attached comments**)*

*"Kaiser has a large impact on our local business environment. There is supporting business employment outside of Kaiser that helps support families and adds to our community. Kaman is one of many that enjoy a business relationship with Kaiser. This relationship enables us to add to the local economy, and community, like many others". **(Dave Smith, Kaman Industrial Technologies, page IIA-26 of attached comments)***

*"My company has been fortunate to be able to provide engineering services to Kaiser over the past several years. As Kaiser's viability as an aluminum manufacturer has rebounded in recent years, my company has been very fortunate to be a vendor of professional services, Our working relationship with Kaiser is just one small example of Kaiser's contribution to the economy of the Inland Northwest." (**James B. Harakas, Geoengineers, page IIA-27 of attached comments**)*

"Kaiser has been a member of the Greater Spokane Valley Chamber of Commerce since 1943 and has been a valued member and significant employer in our community. They have developed processes to create high tech materials needed by the aerospace industry. These products are in demand internationally due to their precision and ability to meet complex specifications. The plant now employs 850 people and is key to continued economic development of the region and the aerospace industry in Washington." ***(Eldonna Shaw, Greater Spokane Valley Chamber of Commerce, page IIA-28 of attached comments)***

Ecology's Response: Ecology recognizes and supports Kaiser's economic contribution to the community. However, the facility and its operations need to comply with federal, state and local regulations. Kaiser has shown its commitment to work with Ecology on several environmental issues to comply with these regulations including MTCA which regulates the cleanup of soils and groundwater. Even though the releases that occurred were historic events, residual contamination is still present at the Site. Ecology will be choosing the final site cleanup actions using the criteria provided for under MTCA. As required under MTCA, the selected remedy or remedies will be "permanent to maximum extent practicable" and protective of human health and the environment. Please note economic contribution to the community does not offset the need to select a remedy most protective for human health and the environment. The cost of implementing the remedy is only one of many factors to be considered.

IV. Response to the e-mail sent by Gene Werden on March 5, 2012 (page IIA-30 of attached comments).

"*Pumping millions of gallons per day of water for years seems to be a poor solution and not 100 percent effective. Even if the water were returned to the aquifer, it would have been compromised in quality.*"

Ecology's Response: Pumping of groundwater has been a useful tool in containing groundwater contamination, as appropriate. Ecology agrees reinfiltrating the contaminated groundwater back into the aquifer may compromise water quality. Ecology is also evaluating if this reinfiltration of groundwater containing PCBs will meet our requirements under MTCA, the state's cleanup law and other applicable state and federal laws.

"*Perhaps building an impermeable wall 100 feet deep, encircling the problem sites would cost less money. You could cover the sites to divert the rainwater. Then introduce microbes, other organisms, or chemicals to neutralize the pollution. Inside of the wall would be isolated from the groundwater. With no added rainwater, it would soon stop draining.*"

Ecology Response: The aquifer underneath the Site goes down to the bedrock estimated to be at 200 to 350 feet below the Kaiser Facility. This very productive aquifer is also estimated to flow at greater than 30 feet/day. It will not be possible to contain groundwater using a 100 feet deep impermeable wall and a 200 to 300-foot wall cannot be technically implemented using current construction methods.

V. Response to Letter dated March 6, 2012 from Brian Crossley, Water & Fish Program Manager, Spokane Tribe, Dept. of Natural Resources sent by e-mail on March 6, 2012 (pages IIA-31 to IIA-32of attached comments).

"...In brief, the Kaiser Facility is one of the largest known sources of PCB contamination along the Spokane River and the Department is very concerned that the Draft Plan does not properly address the magnitude of the contamination, nor does it provide enough certainty that PCB loadings to the Spokane River will be reduced."

Ecology's Response: Ecology believes the Remedial Investigation Reports describe the extent of the petroleum and PCB contamination in soil and groundwater at the Site adequately enough to select cleanup actions. The extent of the PCB contamination is constrained to some extent because of the use of the PCB analytical EPA approved Method 8082, which does not have very low method detection capability. Although EPA Method 1668 is an available method that provides lower detection limits, this method is not currently approved for use by EPA. MTCA requires the use of EPA approved Methods in the gathering of data and in compliance monitoring. Regardless, the RI PCB results show the source of the PCB plume in groundwater and the need to address this contamination.

The primary goal of the alternatives evaluated and proposed in the FS for the PCBs in groundwater is to prevent the discharge of PCBs to the Spokane River. Addressing the PCBs in groundwater will result in the reduction of any potential PCB loadings to the River.

"(1) The plan must state that all PCB testing will be done utilizing the latest EPA approved method that detects low levels of PCBs"

Ecology's Response: MTCA requires the use of approved analytical procedures. The current method for PCBs that is EPA approved is Method 8082. If Method 1668 is approved by EPA, Ecology will require the use of this analytical method primarily for compliance. The requirement to use Method 1668, if it is approved, will be included in the draft CAP.

"(2) The Plan relies on the biodegradation of PCBs as one of the primary remediation tools. The Plan relies on a very small segment of the scientific information regarding biodegradation of PCBs. Additionally, the primary authors of the information relied upon have strong industry ties which calls into question the reliability of it. The Plan's methods must be supported by the scientific community at large. Although biodegradation may be occurring, showing the amount of degradation to reach desired cleanup-levels may not be adequate. Additional methods may need to be developed to remediate PCB contamination based on data results."

Ecology's Response: Ecology agrees the literature information presented is not sufficient to show biodegradation of PCBs is occurring at the Site. Ecology has determined there is not sufficient site evidence that the natural biodegradation of PCBs is occurring at the Site. Thus, Ecology is requiring Kaiser to conduct pilot studies or treatability studies that will provide evidence that PCBs are naturally biodegrading at the Site. If biodegradation is occurring, the rate at which PCBs are biodegrading will also be determined. MTCA requires natural attenuation is appropriate only if the degradation is occurring and will continue to occur at a reasonable rate. Ecology is also requiring Kaiser to conduct a pilot test to determine if it is practicable to treat the extracted groundwater with PCBs using filtration and carbon adsorption. Ecology will select the remedy once sufficient information is available to do so.

"(3) Dept. of Health recommends no fish consumption from the Idaho border to Upriver Dam. The Plan must require that Kaiser fund regular fish tissue testing and monitoring within the stretch of the Spokane River most affected by it. The Plan's goal is to remediate the site for the safety of the general public. Accordingly, understanding the pathways that the general public is exposed to PCB and toxics is of utmost importance."

Ecology's Response: Our focus is based on the MTCA cleanup requirements for soil and groundwater at the Site. The most important goal of the groundwater cleanup is to prevent the potential discharge of PCBs and petroleum contaminants from the Site to the Spokane River. This will eliminate the groundwater to surface water exposure pathway of contaminants from the Site. Thus, groundwater monitoring is an important component of this process in order to measure if the remediation effort is successful. Monitoring fish tissue and the River will not provide a measure of groundwater improvement because there are other sources of PCBs to the river.

Ecology recognizes the importance of fish tissue testing. We, however, believe the Spokane River Regional Toxics Task Force is the best avenue for this kind of effort.

(4) " Kaiser has drilled over 100 test wells on their site but additional sampling such as "lipid bags" should be considered upstream and downstream of the site directly on the Spokane River to evaluate their total PCB load to the River and to monitor the expected reductions."

Ecology's Response: Monitoring of PCBs in the river will not be able to provide information specific to groundwater remediation since there are other sources contributing PCBs to the River. Monitoring the groundwater will provide more accurate information on the performance of the remediation process. Ecology understands the importance of the river sampling, but like the comment concerning fish tissue sampling, this should be more appropriately directed to the Spokane River Regional Toxics Task Force.

VI. Responses to Letter dated March 6, 2012 from Bart Mihailovich, Spokane Riverkeeper, and Mike Petersen, The Lands Council, sent via e-mail on March 6, 2012 (pages IIA-34 to IIA-36 of attached comments).

"...We understand the difference between work done as a result of NPDES permit and this proposed action, but we felt it important to add to our comments because of this collective dedication to PCB clean up and control. Riverkeeper and The Land Council, by joining the Task Force, have committed to our individual members to do everything possible to influence the highest level of PCB control and clean-up. Thus, we urge Ecology to accept only the most thorough and effective clean-up plan for PCBs at the Kaiser Trentwood Site."

"...Preventing PCBs from entering the Spokane River via groundwater at Kaiser is and should be a main focus for Ecology. Even though rule-making is ongoing to adjust water quality standards to accurately address fish consumption in the State of Washington, work must be done now to keep numbers from sites like Kaiser at a safe level for human health. Again, it is our recommendation that Ecology looks very carefully at the options for PCB cleanup and removal, and only accepts the method that is most likely to protect the Spokane River, drinking water, and human health".

Ecology's Response: Preventing PCBs in Site groundwater from discharging to the Spokane River is a main focus of this MTCA cleanup. Since this cleanup is conducted under the authority of MTCA, the selection of the final remedy will be based on the criteria required under MTCA. Whatever final actions are chosen will be protective of human health and the environment as required by the regulation. The cleanup actions will also be "permanent to the maximum extent practicable".

"We understand that EPA Method 1668 has yet to be approved by EPA, but judging by initial analysis, this seems to be the method that is aligned with the highest protection of human health and the ecosystem, thus we support further analysis of this method. Further comments on EPA Method 1668 can be found in Appendix A."

Ecology's Response: Ecology acknowledges EPA Method 1668 would provide the detection limits needed to measure protection of PCBs in groundwater and surface water. However, this method is not currently approved for use by EPA. MTCA requires the use of EPA approved methods for compliance determinations. This method will be used at this Site primarily for compliance if it gets approved by EPA.

"In terms of public health and fish consumption, one proposal we'd like to make is that monies be set aside for fish tissue and sediment sampling. Testing for PCBs in fish is expensive, and unfortunately agencies like both Ecology and the Spokane Regional Health District cannot always afford this as needed. Given the cause and effect relationship to Kaiser's contamination and fish contamination in that stretch of the River, we think this would be a good bio-indicator of effectiveness of the Kaiser remediation effort."

Ecology's Response: Our focus in this project is to address the PCBs in groundwater discharging to the River. Fish tissue and sediment sampling in the Spokane River will not provide data on the effectiveness of the groundwater remediation because there are other sources of PCBs to the River. Groundwater monitoring will provide a more accurate picture of the performance of the groundwater remediation.

As per our response to the Spokane Tribe, the Spokane River Regional Toxics Task Force would be more appropriate venue for this kind of effort.

"It is alleged that of two trails of groundwater contamination called plumes, the larger one containing PCBs and originating in the Remelt Area has not reached the Spokane River. We would like to see monitoring wells or lysimeters situated as such that would give better confidence of this claim. Until then, we are not convinced that PCBs are not making their way to the Spokane River from this plume."

Ecology's Response: Groundwater sampling for PCBs to date, under the current approved method, does not indicate the PCB plume has reached the river. However, Ecology has not ruled out the possibility PCBs have entered the river at levels below the detection limit of the current approved of analysis (Method 8082). Ecology believes we have sufficient monitoring wells located near the river that can be used to investigate PCBs discharging to the River; however, there is no approved analytical method for PCBs at this point that provides the low detection capability. Kaiser has used Method 1668 on a very limited basis to investigate PCBs in groundwater. However, the results cannot be used for compliance determinations because Method 1668 is not an EPA approved method.

"...Furthermore, we would like to see more of an emphasis on removal as opposed to containment."

Ecology's Response: MTCA requires treatment over containment for long-term effectiveness. However, MTCA recognizes the need to use engineering controls, such as containment, for sites or portion of sites that contain large volumes of materials with relatively low levels of hazardous substances where treatment is impracticable. Containment only will be used if Kaiser can show it is not practicable to treat the PCBs in groundwater at the Site; thus Ecology's requirement that Kaiser do a pilot study on the treatment of PCBs using filtration and carbon treatment.

"We are concerned with Kaiser's claim that PCB will break down over time. Their claim is not a balanced assessment of the scientific literature and does not adequately present information on the difficulties in producing an environment suitable for degradation of PCBs by microorganisms. This is discussed in detail in the comment included as Appendix A. We encourage you to encourage Kaiser to conduct more studies and investigate more possible methods. For a major clean up like this, several pilot projects should occur to ensure the path forward is both thorough and effective."

Ecology's Response: Ecology has not accepted Kaiser's expectation of PCBs biodegrading at the Site based on literature citations. Ecology is requiring Kaiser to conduct pilot studies or treatability studies to determine if this process is occurring at the Site. We are also requiring Kaiser to conduct a pilot study to determine if it is practicable to treat the PCBs in groundwater. Please see Response in I.

"Finally, we encourage Ecology to take its time on investigating the former West Discharge Ravine and former South Discharge Ravine. Because of the River's nature during high flows to back up to these ravines, and because of the presence of PCBs, we would like to see Ecology and Kaiser implement a plan to ensure utmost River protection."

Ecology's Response: The South Ravine investigations completed during the RI showed the presence of PCBs in shallow soils. Kaiser is recommending the excavation of these soils in the FS. The additional studies in the former West Discharge Ravine will be completed in March 2012.

Appendix A (page IIA-38): "...The FS needs to state clearly that Method 1668 B will be used to measure PCBs or if EPA approves Method 1668C, that Method also may be used; Method 8082 is not good enough."

Ecology's Response: Ecology acknowledges the current approved method for PCBs does not provide the low detection limits to measure compliance with surface water standards and Method 1668 is the more appropriate method to use for PCBs at the Site. However, MTCA requires the use of EPA approved methods for compliance. Method 1668 B or C is not approved for use by EPA. If this Method is approved by EPA, Ecology will require the use of this analytical method. This requirement will be included in the draft CAP.

Appendix A (page IIA-41): "Conclusions: The lack of supporting peer-reviewed scientific literature, as well as the improper citations and references, indicates a poorly executed and researched report. Additionally, because there has not been a consistent, dependable outcome for biodegradation of PCBs across multiple contaminated sites, it cannot be called upon as a reliable remediation strategy at the Kaiser Trentwood Facility."

Ecology's Response: Ecology has not accepted Kaiser's literature citations as evidence of PCBs naturally biodegrading at the Site. Ecology is requiring Kaiser to collect site-specific data to demonstrate the occurrence of this biodegradation and to determine the rate of destruction if biodegradation is found to be taking place. At this time, Ecology has not accepted biodegradation of PCBs at the Site as a potential remedy for the site.