5. Hazardous Materials

The purpose of this section is to identify hazardous materials sites within the study area, and provide reasonably ascertainable information regarding their recognized environmental conditions (REC). A REC is

> "...the presence or likely presence of any hazardous substances or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, groundwater or surface water of the property. The term includes hazardous substances or petroleum products even under conditions in compliance with laws. The term is not intended to include de minimus conditions that generally do not present a material risk of harm to public health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies."

In addition, this section provides information regarding contaminant evaluations for Columbia River sediment located within or adjacent to the study area.

5.1 Federal and State Environmental Database Search Results

To help establish the location, conditions, and status of hazardous materials sites, an environmental database search was conducted along a 1-mile radius from the boundaries of the Area of Potential Impact (API).

Parametrix obtained available government records from federal, state and sources. Information for the database review is based on a report provided by Environmental Data Resources (EDR), who compiled government database records through January 29, 2009. The EDR report is included in Appendix B (CD-ROM). Methodology used for conducting the database search is consistent with that used for the Hazardous Materials Report in the Draft Environmental Impact Statement (DEIS).

Exhibit 5-1 presents a summary of environmental database search results within the search radius. Each site has been given a unique site identification number (Site ID) by the project team. In general, Site IDs have been assigned in ascending order from south to north. Site IDs have a corresponding non-unique EDR database listing number, with both numbers listed numerically. The EDR number can be used to find further details regarding a site in the EDR report (Appendix B). The database search identified 122 hazardous material sites in the Washington search area. Of the 122 sites, 63 were identified as having known or suspected release.

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Exhibit 5-1
Environmental Database Search Results

MAP ID	EDR MAP ID	SITE NAME	ADDRESS	Regulatory Database Results: Federal: CERCLIS	NPL	DELISTED NPL	CERCLIS-NFRAP	RCRA-LQG	RCRA-CESQG	RCRA-TDSF	RCRA-NLR	ERNS	INST CONTROL	ENG CONTROL	CORRACTS	RODS	TCSA	RAATS	FTTS	HIST FTTS	DOT OPS	PADS	FINDS	Washington State: CSCSL / HWS	CSCSL-NFA	SWF/LF	LUST	UST	MANIFEST	SPILLS	VCP	ICR	INST CONTROL	NPDES	AIRS	INACTIVE DRYCLEANERS	Number of Databases Identified	Known or Suspected Release
1	69	HILLMAN PROPERTIES NORTHWEST MARITIME	500 SE MARITIME BLDG 5						1						1			1					1														4	N
2	68	HILLMAN PROPERTIES	2000 E COLUMBIA WAY BLDG 39				1				1				1			1					1														5	Y
3	67	QUAD INVESTMENTS	3000 LEWIS & CLARK HWY WHOLE						1														1														2	N
4	0	FRONTIER HARDCHROME	113 Y ST	1	1						1		1	1		1							1	1													8	Y
5	66	111 E COLUMBIA WAY	111 E COLUMBIA WAY																		1																1	N
6	66	100 COLUMBIA ST	100 COLUMBIA ST																										1								1	Y
7	59	HANNAH MOTOR COMPANY	300 WASHINGTON ST								1												1				1	1			1						5	Y
8	59	3RD / WASHINGTON	3RD / WASHINGTON																										1								1	Y
9	58/65	BOISE CASCADE WHITE PAPER LLC	907 W 7TH ST					1														1	1	1				1	1								6	Y
10	64	CAPITAL TACKEL MFG	404 W 4TH ST						1														1					1									3	U
11	59	HANNAH MOTOR COMPANY UST 9879	400 WASHINGTON																				1					1									2	U
12	63	US DOT FEDERAL HIGHWAY ADMINISTRATION	610 E 5TH ST								1												1				1	1									4	Y
13	62	PACIFIC CHEMICALS ENGINEERING	PORT OF VANCOUVER TRMNL 2 B3								1												1														2	N
14	59	FROM THE KENNELS	500 WASHINGTON ST								1												1														2	N
15	59	HANNAH MOTOR CO	411 W 5TH ST								1												1														2	N
16	59	ADMIRAL DISTRIBUTING	301 W 5TH ST																				1					1									2	U
17	59	515 WASHINGTON STREET	515 WASHINGTON STREET																											1							1	Y
18	59	FAULKNER USA	512 COLUMBIA ST					1															1														2	N
19	61	VANCOUVER BARRACKS	HATHAWAY RD BLDG 404																								1	1									2	Y
20	60	HANNAH MOTOR COMPANY VW	114 E 6TH ST																				1					1									2	U
21	59	SOUTHWEST DELIVERY CO INC	415 W 6TH ST								1												1				1	1				1					5	Y
22	59	LUCKY LAGER BREWERY	230 W 6TH ST								1												1														2	N
23	59	VANCOUVER CITY 6TH ST	512 NW 6TH ST																									1									1	U
24	59	HANNAH MOTOR CO BODY SHOP	615 W 6TH ST								1												1														2	N
25	57	VANCOUVER ICE & FUEL	1112 W 7TH ST																						1												1	Y
26	56	130 WEST 8TH STREET	130 WEST 8TH STREET									1																									1	Y
27	53	COLUMBIAN PUBLISHING CO	701 W 8TH ST						1														1					1	1								4	U
28	54	VANCOUVER CITY BREWERY BLOCKS	400 W 8TH ST																				1		1						1						3	Y
29	51	PORT OF VANCOUVER 058720-000	1501 W 8TH STREET																					1													1	Y
30	53	EOFF ELECTRIC CO	808 HARNEY																									1									1	U
31	55	PRI NORTHWEST INC VANCOUVER	1300 W 8TH ST								1												1	1				1			1						5	Y
32	52	PACIFIC TELECOM CORP OFFICE	805 BROADWAY CORPORATE OFFICE								1												1														2	N
33	54	GENERAL BREWING COMPANY	615 COLUMBIA ST																				1					1									2	U
34	53	VANCOUVER WELDING SUPPLY CO	800 HARNEY ST																									1									1	U
35	52	BILL COPPS INC	901 C ST						1														1					1	1								4	U

Exhibit 5-1
Environmental Database Search Results

MAP ID	EDR MAP ID	SITE NAME	ADDRESS	Regulatory Database Results: Federal																				Regulatory Database Results: Washington State													Number of Databases Identified	Known or Suspected Release
				CERCLIS	NPL	DELISTED NPL	CERCLIS-NFRAP	RCRA-LQG	RCRA-CESQG	RCRA-TDSF	RCRA-NLR	ERNS	INST CONTROL	ENG CONTROL	CORRACTS	RODS	TCSA	RAATS	FTTS	HIST FTTS	DOT OPS	PADS	FINDS	CSCSL / HWS	CSCSL-NFA	SWF/LF	LUST	UST	MANIFEST	SPILLS	VCP	ICR	INST CONTROL	NPDES	AIRS	INACTIVE DRYCLEANERS		
36	42	METRO BUICK OLDS VANCOUVER	904 WASHINGTON ST								1												1				1	1				1					5	Y
37	51	FORT VANCOUVER PLYWOOD	901 PORT WAY				1				1												1	1				1					1					5	Y
38	50	AUTOMOTIVE SERVICES INC	2210 NW MILL PLAIN BLVD																					1														1	Y
39	49	WA STATE PATROL VANCOUVER	605 E EVERGREEN						1														1					1										3	U
40	42	ACTION CAMERA	112 E EVERGREEN BLVD																				1														1	N
41	48	ACADEMY	400 E EVERGREEN BLVD																				1					1										2	U
42	42	MARSHALL VANCOUVER FORD	1004 WASHINGTON ST								1												1															2	N
43	42	WOLF SUPPLY CO VANCOUVER	301 W 11TH ST								1												1					1										3	U
44	42	1104 MAIN STREET	1104 MAIN STREET																										1								1	Y
45	46	HEGEWALD INC	701 W 11TH ST																									1									1	U
46	47	CLARK COUNTY JUVENILE DEPT	500 W 11TH ST																									1									1	U
47	42	PORTSIDE LAGOON AND LANDFILL	1111 MAIN STREET, SUITE 700																					1									1				2	Y
48	42	AT&T WIRELESS DOWNTOWN VANCOUVER	1111 MAIN ST								1												1														1	N
49	42	OLTMANNS MOBIL SERVICE	1114 WASHINGTON								1												1				1										2	U
50	44	CLARK CNTY PUD LOWER RIVER RD	1200 FORT VANCOUVER WAY								1												1				1										2	U
51	42/45	EMERALD PETROLEUM/INMAN OIL CO	1300 W 12TH ST				1	1			1						1						1	1			1	1		1							9	Y
52	42/45	VANRICH CASTING	1200 W 13TH ST				1																		1	1							1	1			5	Y
53	44	FORT VANCOUVER REGIONAL LIBRARY	1007 E MILL PLAIN BLVD																				1					1										2	U
54	43	VANCOUVER POLICE BUILDING	300 E 13TH ST								1												1															2	N
55	43	UNKNOWN	300 EAST 13TH STREET																										1								1	Y
56	41	CLARK COUNTY CORRECTION CENTER	707 W 13TH ST								1												1					1										3	U
57	41	ROYAL APTS	706 W 13TH ST																									1									1	U
58	40	BRAZIER FOREST INDUSTRIES	1401 INDUSTRIAL WAY								1												1	1													3	Y
59	34	VANCOUVER CHEVRON	210 E MILL PLAIN BLVD																				1					1										2	U
60	33	QC CLEANERS	1401 WASHINGTON ST						1														1													1	3	N
61	34	CHUCK'S TIRE & AUTO SERVICE	1416 BROADWAY																				1				1	1			1						4	Y
62	38	CLARK COUNTY PUBLIC WORKS	1408 FRANKLIN																									1									1	U
63	39	CLARK COLLEGE	1800 E MCLOUGHLIN BLVD						1														1					1	1			1					5	Y
64	33	VANCOUVER ENGINE EXCHANGE	1505 COLUMBIA ST								1												1														2	N
65	34	KYUNGSHIN CHOI MATTHIEUS CAR CARE/GEM EQUIPMENT	1505 BROADWAY																				1				1	1			1					4	Y
66	38	WASTE MANAGEMENT OF VANCOUVER	515 W 15TH ST																							1										1	N
67	33	PINKERTONS AUTO REPAIR	1520 WASHINGTON ST																				1					1										2	U
68	37	MCLOUGHLIN BLVD / FORT VANCOUVER WAY	MCLOUGHLIN BLVD / FORT VANCOUVER																											1							1	Y
69	36	NUSTAR ENERGY LP	2565 NW HARBORSIDE DR																					1									1				2	Y
70	33	BENNETT PAPER & SUPPLY INC	1602 WASHINGTON ST								1								1	1			1														3	N

Exhibit 5-1
Environmental Database Search Results

MAP ID	EDR MAP ID	SITE NAME	ADDRESS	Regulatory Database Results: Federal																			Regulatory Database Results: Washington State													Number of Databases Identified	Known or Suspected Release
				CERCLIS	NPL	DELISTED NPL	CERCLIS-NFRAP	RCRA-LQG	RCRA-CESQG	RCRA-TDSF	RCRA-NLR	ERNS	INST CONTROL	ENG CONTROL	CORRACTS	RODS	TCSA	RAATS	FTTS	HIST FTTS	DOT OPS	PADS	FINDS	CSCSL / HWS	CSCSL-NFA	SWF/LF	LUST	UST	MANIFEST	SPILLS	VCP	ICR	INST CONTROL	NPDES	AIRS	INACTIVE DRYCLEANERS		
71	33	SERVICE BATTERIES	210 WEST 16TH ST																						1											1	N
72	34	16TH / BROADWAY	16TH / BROADWAY																									1								1	Y
73	33	HOLLAND BURGERVILLE PROPERTY	17TH W & COLUMBIA																			1				1										2	U
74	33	SHOP INC DBA LARKINS GARAGE	1708 WASHINGTON ST								1											1														2	N
75	34	DON LORENTZ & ASSOCIATES	1714 BROADWAY																			1				1										2	U
76	34	SHERWIN WILLIAMS CO VANCOUVER	1717 BROADWAY								1											1														2	N
77	34	ESTATE OF MARY E MACKAY	1700 BROADWAY ST					1														1				1										3	U
78	35	VANCOUVER CITY MARSHALL CENTER	1009 E MCLOUGHLIN BLVD																			1														1	N
79	33	HOESLY AUTO SERVICE	210 W. MCLOUGHLIN BLVD.																			1				1	1				1					4	Y
80	33	SAMS AUTO BODY	1813 COLUMBIA						.1													1														2	N
81	34	214 E MCLOUGHLIN BLVD	214 E MCLOUGHLIN BLVD																										1							1	Y
82	33	VELMA B JORDAN	1812 WASHINGTON ST																			1				1										2	U
83	30	CITY OF VANCOUVER	1912 MAIN																			1				1	1									3	Y
84	32	COLUMBIA OIL	1923 D ST.																										1							1	Y
85	31	MALCOLM MONTAGUE	1600 W 20TH ST																					1												1	Y
86	30	SECURE UNDERGROUND LLC	100 W 20TH ST																										1							1	Y
87	29	PINNACLE INC	300 E 20TH ST																			1				1										2	U
88	28	ASTRO MINIT MART 730	2201 MAIN ST																			1		1			1			1	1					5	Y
89	27	VANCOUVER WATER STATION #1 CONTAMINATION	E. RESERVE AND N.E. FOURTH PLAIN BLVD.	1	1								1		1							1														5	Y
90	26	USWCOM VANCOUVER OXFORD CO	214 E 24TH ST								1											1					1									3	U
91	25	PHOENIX 120 GRANT ST PROPERTY	2315 GRANT ST																			1		1						1						3	Y
92	24	TIRES UNLIMITED	2300 E FOURTH PLAIN BLVD				1																													1	Y
93	23	DEPT OF VETERANS AFFAIRS	1601 E 4TH PLAIN																							1										1	Y
94	23	VA MEDICAL CENTER VANCOUVER DIVISION	FOURTH PLAIN BLVD & O ST						1													1						1								3	N
95	22	CLARKES EUROPEAN AUTO REPAIR	2612 MAIN ST																			1		1			1			1						4	Y
96	21	VANCOUVER CITY UST 101305	28TH & MAIN ST																			1					1									2	U
97	20	SHULL PROPERTY	317 W 28TH ST																					1												1	Y
98	20	CRITES PROPERTY	320 W 28TH ST																					1												1	Y
99	19	QUICK SHOP MINIT MART #28	2901 ST JOHNS BLVD								1											1					1				1					4	Y
100	18	CLIFF KOPPE METALS INC	1700-1701 W 4TH PLAIN BLVD																					1												1	Y
101	17	CASCADE AUTO BODY	2600 EAST 33RD ST																								1									1	Y
102	16	FIRST UNITED METHODIST CHURCH	401 E 33RD AVE																									1								1	U
103	15	SOUTHWEST WASHINGTON MEDICAL CENTER	3400 MAIN ST																								1	1				1				3	Y
104	14	DEGAGNE PROPERTY	3500 S ST																					1												1	Y
105	13	TIME OIL CO ST JOHNS BLVD	5501 ST JOHNS BLVD								1											1			1					1						4	Y

Exhibit 5-1
Environmental Database Search Results

MAP ID	EDR MAP ID	SITE NAME	ADDRESS	Regulatory Database Results: Federal: CERCLIS	NPL	DELISTED NPL	CERCLIS-NFRAP	RCRA-LQG	RCRA-CESQG	RCRA-TDSF	RCRA-NLR	ERNS	INST CONTROL	ENG CONTROL	CORRACTS	RODS	TCSA	RAATS	FTTS	HIST FTTS	DOT OPS	PADS	FINDS	Washington State: CSCSL / HWS	CSCSL-NFA	SWF/LF	LUST	UST	MANIFEST	SPILLS	YCP	ICR	INST CONTROL	NPDES	AIRS	INACTIVE DRYCLEANERS	Number of Databases Identified	Known or Suspected Release
106	10	RUDYS RELIABLE AUTO CARE	3800 MAIN ST						1														1														2	N
107	12	HIDDEN BROTHERS	3824 S S																								1										1	U
108	10	ARCO 5739	3817 MAIN ST						1														1				1	1									4	U
109	11	E 39TH / NE 15TH AVE	E 39TH / NE 15TH AVE																										1								1	Y
110	10	BBC PETRO GROUP INC/76 24 HR FOOD MART	3901 MAIN ST																				1		1		1			1	1						5	Y
111	9	WA DOT VANCOUVER	4200 MAIN ST								1												1	1				1	1									5	Y
112	8	TIME OIL HANDY ANDY 8	3314 NE 44TH ST																				1	1														2	Y
113	7	CALHOUN PROPERTY	5014 NE 20TH AVENUE																					1														1	Y
114	6	HUNTINGTON PROPERTY	1207 NW 49TH ST																					1														1	Y
115	5	5009 NE HAZELDELL AVE	5009 NE HAZELDELL AVE																											1								1	Y
116	3/4	US DOE BPA ROSS COMPLEX	5411 NE HWY 99	1		1		1		1			1	1	1	1						1			1		1		1	1		1					14	Y
117	2	JUMBOS CAR WASH & GAS	6821 NE HWY 99																					1			1	1										3	Y
118	1	HAZEL DELL AUTO CARE CENTER	6900 NE HWY 99								1												1	1							1							4	Y
119	ORPHAN	PORT OF VANCOUVER 058720-000	2001/2500 W Fourth Plain																					1				1										2	?
120	ORPHAN	Special Events & Convention Center	BTW 4th&6th & Columbia&Ester										1										1		1	1					1							5	Y
121	ORPHAN	VANCOUVER SUB INSTALLATION	VANCOUVER BARRACKS BLDG 638																				1					1										2	U
122	ORPHAN	US ARMY VANCOUVER BARRACKS	BLDG 993				1																														1	Y
			Number of Database Hits	**3**	**2**	**1**	**6**	**5**	**12**	**1**	**28**	**1**	**3**	**3**	**3**	**3**	**1**	**2**	**1**	**1**	**1**	**2**	**75**	**22**	**10**	**4**	**15**	**54**	**9**	**13**	**10**	**12**	**1**	**3**	**1**	**1**	--	**63**

Exhibit 5-2 displays the approximate locations of identified hazardous material sites. Site locations and addresses were verified by reviewing tax lot detail, plotting address information in the Microsoft LiveSearch web site (accessed April 2009) utilizing the bird's eye view function, and the Google Maps web site utilizing the Street View function (accessed April 2009). For the purpose of this report, site locations are approximate and do not represent the spatial position of the environmental impact.

5.1.1 Federal Database

Exhibit 5-1 indicates that 122 potential hazardous material sites were identified within the search area. Of the 122 potential hazardous material sites within the search:

- 3 were identified as CERCLIS
- 2 were identified as NPL
- 1 was identified as Delist NPL
- 6 were identified as CERCLIS NFRAP
- 5 were identified as RCRA LQG
- 12 were identified as RCRA SQG
- 1 was identified as RCRA TDSF
- 11 were identified as RCRA NLR
- 1 was identified as ERNS
- 3 were identified as INST Controls
- 3 were identified as ENG Controls
- 3 were identified as CORRACTS
- 3 were identified as RODS
- 1 was identified as TSCA
- 2 were identified as RAATS
- 1 was identified as FTTS
- 1 was identified as HIST-FTTS
- 1 was identified as DOT OPS
- 2 were identified as PADS
- 75 were identified as FINDS

Sites may be identified by one or more databases. A brief description of each federal database with listed sites is provided below.

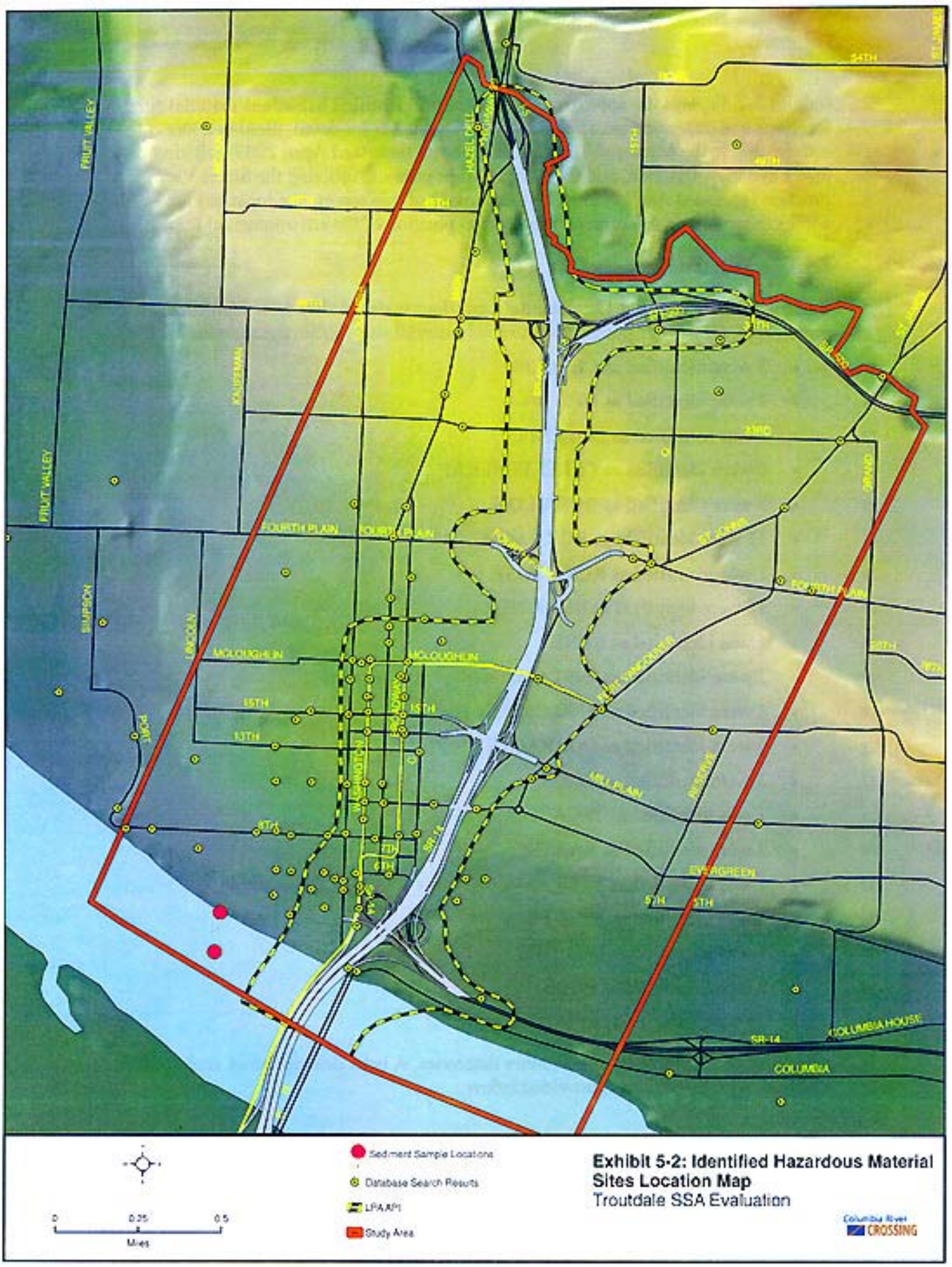

Exhibit 5-2: Identified Hazardous Material Sites Location Map
Troutdale SSA Evaluation

Columbia River CROSSING

CERCLIS

The Comprehensive Environmental Response, Compensation and Liability Information System contains data on potentially hazardous waste sites that have been reported to the U.S. EPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). CERCLIS contains sites which are either proposed to or are on the National Priorities List (NPL), and sites which are in the screening and assessment phase for possible inclusion on the NPL.

National Priority List (NPL)

Also known as Superfund, the National Priority List database is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund program. The source of this database is the U.S. EPA.

Delisted NPL

The National Oil and Hazardous Substances Pollution Contingency Plan established the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may deleted from the NPL where no further federal response is appropriate.

CERCLIS-NFRAP

The Comprehensive Environmental Response and Liability Information System – No Further Remedial Action Planned database search identified sites that have been removed from CERCLIS or have achieved archived status. These sites have been removed from CERCLIS because no contamination was found. Archived status means that, to the best of EPA's knowledge, assessment of the site has been completed and that EPA has determined that no further steps will be taken to list this site on the NPL, unless information indicates that this decision was not appropriate or other considerations require a recommendation for listing at a later time.

RCRIS

The Resource Conservation and Recovery Information System database search identified sites that generate, transport, store, treat, and/or dispose of hazardous waste and that are defined by RCRA as small quantity generator (SQG) or large quantity generator (LQG). SQG generate between 100 kilograms (kg) and 1,000 kg of hazardous waste per month. LQG generate over 1,000 kg of hazardous waste per month.

RCRA-TSDF

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The RCRA-Treatment, Storage and Disposal Facilities (TSDFs) database includes selective information on sites

which generate, transport, store, treat and/or dispose of hazardous waste as defined by the RCRA. Transporters are individuals or entities that move hazardous waste from the generator offsite to a facility that can recycle, treat, store, or dispose of the waste.

RCRA-NLR

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the RCRA of 1976 and the HSWA. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the RCRA. Non-generators do not presently generate hazardous waste.

ERNS

The Emergency Response and Notification System database search identified sites that have released oil and/or hazardous materials.

INST CONTROL

A listing of sites with institutional controls in place including administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

ENG CONTROL

A listing of sites with engineering controls in place intended to eliminate or reduce exposure to contaminants remaining on site. These may be physical structural elements that are used to remove a hazard or place a barrier between the receptor and the hazard.

CORRACTS

CORRACTS is a list of handlers with RCRA corrective action activity. This report shows which nationally defined corrective action core events have occurred for every handler that has had corrective action activity due to improper procedures or handling.

ROD

A listing of sites where Record of Decision documents mandate a permanent remedy at an NPL site containing technical and health information to aid the cleanup.

TSCA

The Toxic Substances Control Act identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site. The United States Environmental Protection Agency has no current plan to update and/or re-issue this database.

RAATS

The RCRA Administration Action Tracking System contains records based on enforcement actions issued under RCRA and pertaining to major violators. It includes administrative and civil actions brought by the United States Environmental Protection Agency.

HIST-FTTS

The Historical FIFRA/TSCA Tracking System database search identified sites with a complete listing of FTTS.

FTTS: FIFRA

The Federal Insecticide, Fungicide, Rodenticide Act database search identified sites that had pesticide enforcement actions and compliance activities related to TSCA and the Emergency Planning and Community Right-to-Know Act.

HMIRS

The Hazardous Materials Incident Report System database search identified sites that reported to the Department of Transportation (DOT) incidents of hazardous materials spills.

TRIS

The Toxic Chemical Release Inventory System database search identified sites that released toxic substances to air, water, or land in reportable quantities under SARA Title III (Superfund Reauthorization Act).

ICIS

The Integrated Compliance Information System database search identified sites that are under the National Pollutant Discharge Elimination System (NPDES).

STTS

The STTS (Section 7 of the FIFRA) database search identified registered pesticide producing sites that are required to submit reports to the EPA regarding active ingredients, quantities, and devices being produced.

DOT OPS

Department of Transportation, Office of Pipeline Safety Incident and Accident data.

PADS

The PCB Activity Database search identified sites which were generators, storers, and/or brokers or disposers of polychlorinated biphenyls (PCBs) who are required to notify the EPA.

FINDS

The Facility Index System database search identified sites that contain facility information or contain pointers to other databases.

5.1.2 Washington State Database

Of the 122 potential hazardous material sites identified in the database search within the study area:

- 22 were identified as CSCSL HWS
- 10 were identified as CSCSL NFA
- 4 were identified as SWF
- 15 were identified as LUST
- 54 were identified as UST
- 9 were identified as MANIFEST
- 13 were identified as SPILLS
- 10 were identified as VCP
- 12 were identified as ICR
- 1 was identified as INST Controls
- 3 were identified as NPDES
- 1 was identified as AIRS
- 1 was identified as Inactive Drycleaners

Sites may be identified by one or more databases. A brief description of each database with listed sites is provided below.

SHWS

The State Hazardous Waste Sites records are the states' equivalent to CERCLIS. These sites may or may not already be listed on the federal CERCLIS list. Priority sites planned for cleanup using state funds (state equivalent of Superfund) are identified along with sites where cleanup will be paid for by potentially responsible parties. The data come from the Department of Ecology's Confirmed & Suspected Contaminated Sites List.

CSCS NFA

The data set contains information about sites previously on the Confirmed and Suspected Contaminated Sites list that have received a No Further Action (NFA) determination. Because it is necessary to maintain historical records of sites that have been investigated and cleaned up, sites are not deleted from the database when cleanup activities are completed. Instead, a No Further Action code is entered based upon the type of NFA determination the site received.

SWF/LF

The Solid Waste Facilities/Landfill Sites records typically contain an inventory of solid waste disposal facilities or landfills in a particular state. The data come from the Department of Ecology's Solid Waste Facilities Handbook.

LUST

The LUST (Leaking Underground Storage Tank) database search identified sites that have reported an incident of a release of a hazardous material and/or petroleum product.

UST

The UST (Underground Storage Tank) database search identifies sites with registered USTs. Registration of a UST does not indicate that an incident of release has occurred.

MANIFEST

This database provides a list of sites with hazardous waste manifest information.

SPILLS

This database provides a comprehensive list of reported spills.

VCP

A listing of sites that have entered either the Voluntary Cleanup Program or its predecessor the Independent Remedial Action Program.

ICR

These are remedial action reports Ecology has received from either the owner or operator of the site. These actions have been conducted without department oversight or approval and are not under an order or decree.

INST CONTROL

The INST CONTROL (Institutional Controls) database search identifies sites that have institutional controls (ICs) to prevent or minimize exposure to hazardous substances. ICs include, but are not limited to, governmental controls, proprietary controls, information, and enforcement controls.

NPDES

The WA NPDES database is a listing of permitted waste water facilities in the State of Washington.

AIRS

State of Washington, Department of Ecology, Washington Emissions Data System.

Inactive Drycleaners

A listing of inactive drycleaner facility locations.

5.2 Other Sites of Potential Environmental Concern

Other sites of potential environmental concern include, but are not limited to, the SMC/Cadet Manufacturing Site, the ST Services Site, U.S. Department of Energy Bonneville Power Administration Ross Complex, Frontier Hard Chrome, and Albina Fuel. These sites do not fall within the study area, but were identified in the database search. These sites are generally recognized by the Washington State Department of Ecology (Ecology) as contributing to groundwater contamination in the greater Vancouver area. Currently, most of these sites are conducting cleanup under an agreed order with the State of Washington or under a consent decree with EPA.

Contaminants associated with these sites include, but are not limited to, chlorinated solvents, metals, and petroleum hydrocarbons. The extent of groundwater impacts from these sites within the study area has not been fully delineated. However, groundwater impacts in the study area, if any, are thought to consist of a low-concentration dissolved-phase solvent plume (see Exhibit 4-13).

5.3 In-Water Sediments

Parametrix reviewed data from federal, state, and local databases for sediment evaluations performed within close proximity to existing Interstate 5 bridge. The EPA Environmental Management and Assessment Program (EMAP) database was searched for sediment evaluations in the study area. The Department of Ecology's Environmental Information Management System (EIM) database was also queried for recent sediment sampling and analyses performed under the State of Washington jurisdiction. Legacy data were retrieved using SEDQUAL, the predecessor to the EIM database. For evaluations performed under State of Oregon jurisdiction, the U.S. Army Corps of Engineers (USACE) Portland District was contacted.

5.3.1 Columbia River Bi-State Program

As part of the Columbia River Bi-State Survey Program, sediment sampling and analysis were performed in 1991 and 1993 (Tetra Tech 1992-1993). Bi-State Program sample collection stations were located within 1 mile from the I-5 Bridge within the navigation channel. Concentrations of chemicals of concern in sediment samples were below screening levels established for evaluating the suitability of open water disposal.

5.3.2 Columbia River Channel Deepening Project

The U.S Army Corp of Engineers (USACE) conducted a study (USACE 2009) to characterize the river sediment for dredging as part of the Columbia River Channel Deepening project. In June 1997, 89 stations were sampled from the Columbia River channel, between River Mile (RM) 6 to RM 106.2, for physical analysis. Samples from twenty-three of the 89 stations were further analyzed for chemical contaminants.

Analyses for inorganic total metals, polynuclear aromatic hydrocarbons (PAHs), total organic carbon (TOC), acid volatile sulfide (AVS), pesticides, polychlorobiphenyls (PCBs), pore water tributyltin (TBT), and P450 reporter gene system (RGS), a dioxin/furan screen, were performed on selected samples. Two sample collection stations (CR-BC-88 and CR-BC-89) were within 0.5 mile from the I-5 bridge (Exhibit 5-2). All sample results for these stations were below screening level values (Exhibit 5-3).

Following the June 1997 sampling event, the Columbia River mile segment nearest the I-5 bridge (RM 99 to 106) was given "exclusionary" ranking in accordance with the Dredge Material Evaluation Framework (DMEF) for the Lower Columbia River Management Area. Exclusionary rank is given to coarse grain material (greater than 80 percent retained on a No. 230 sieve) with Total Volatile Solids less than 5 percent and sufficiently removed from sources of sediment contamination. Under the DMEF guidelines, this ranking authorizes dredged sediment to be suitable for unconfined aquatic disposal without further testing.

Dredging in the main Columbia River channel near the Interstate 5 Bridge was completed in 2007 using a hopper dredge. The main channel dredging is authorized from RM 3 to 106.5, but actual dredging extended to only RM 105.5. Mechanical excavation near RM 105 in front of the Port of Vancouver docks was completed in 2008.

In August 2008, a sediment sampling study was conducted in the mainstem Columbia River similar to the June 1997 sampling effort. The final data and completed data report were not available when this report was being prepared (Siipola 2009).

Exhibit 5-3. Summary of Physical and Analytical Results

Analysis	Units	Sample Location		Screening Levels[1]
		CR-BC-88	CR-BC-89	
Physical Analysis				
Water Depth*	ft	39.1	34.1	-
River Mile	mi	106+20	106+20	-
Grain Size - Mean	mm	0.89	0.59	-
Grain Size - Median	mm	0.73	0.51	-
Sand	% fines	1.1	2.9	-
Very Fine Sand	% fines	0.1	0.3	-
Silt	% fines	0.0	0.3	-
Clay	%	0.0	0.0	-
Volume of Solids	%	0.5	0.6	-
Solids	%	88.9	-	-
TOC	%	<0.05	-	-
Metals				
Arsenic	mg/kg	1.0	-	57
Cadmium	mg/kg	<0.8	-	5.1
Chromium	mg/kg	3.0	-	NA
Copper	mg/kg	5.0	-	390
Lead	mg/kg	2.0	-	450
Mercury	mg/kg	<0.05	-	0.41
Nickel	mg/kg	6.0	-	140
Silver	mg/kg	<0.6	-	6.1
Zinc	mg/kg	31.0	-	410
AVS	%	<0.7	-	-
Pesticides and PCBs				
Aldrin	µg/kg	<2	-	10
DDT	µg/kg	<2	-	-
DDE	µg/kg	<2	-	-
DDD	µg/kg	<2	-	-
Total DDT	µg/kg	ND	-	6.9
Aroclor 1254	µg/kg	<10	-	-
Aroclor 1260	µg/kg	<10	-	-
Total PCBs	µg/kg	ND	-	130
Low PAHs				
Napthalene	µg/kg	0.7	-	2,100
2-Methylnapthalene	µg/kg	0.6	-	670
Acenaphthalene	µg/kg	<5	-	560
Acenaphthene	µg/kg	<5	-	500
Fluorene	µg/kg	0.7	-	540
Phenanthrene	µg/kg	2.0	-	1,500
Anthracene	µg/kg	0.8	-	960
Total Low PAHs	µg/kg	6.0	-	5,200

Analysis	Units	Sample Location		Screening Levels[1]
		CR-BC-88	CR-BC-89	
High PAHs				
Fluroanthrene	µg/kg	2.0	-	1,700
Pyrene	µg/kg	<5	-	2,600
Benzoanthracene	µg/kg	2.0	-	1,300
Chrysene	µg/kg	2.0	-	1,400
Benzo(b,k)fluoranthene	µg/kg	5.0	-	3,200
Benzo(a)pyrene	µg/kg	2.0	-	1,600
Ideno(1,2,3-cd)pyrene	µg/kg	2.0	-	600
Dibenz(a,h)anthracene	µg/kg	1.0	-	230
Benzo(g,h,i)perylene	µg/kg	5.0	-	670
Total High PAHs	µg/kg	21.0	-	12,000
P450 Reporter Gene ATSSAy (Dioxin/Furan Screen)				
6 Hour B(a)P Eq	µg/g	0.60	-	-
6 Hour TEQ	ng/g	0.03	-	-
16 Hour B(a)P Eq	µg/g	0.10	-	-
16 Hour TEQ	ng/g	0.01	-	-
Ratio	-	7	-	-
Primary Contaminates**	-	PAHs	-	-

Acronyms
AVS - Acid Volatile Sulfide
PAH - Polynuclear Aromatic Hydrocarbons
PCB - Polychlorinated Biphenyls
TEQ - Toxicity Equivalent
TOC - Total Organic Carbon

Notes
[1] Table 6-1, Dredged Material Evaluation and Disposal Procedures (USACE, et al. July 2008)
*Corrected to river datum
**Based on ratio of 6 hr/16 hr where ratio > 5 = PAHs; ration 5 to 1 = both PAHs and chlorinated compounds; and ratio < 1 = chlorinated compounds
< - Denotes a non-detect at the numerical level listed

Units
ft - feet
mi - miles
mg/kg - milligrams per kilogram
mm - millimeters
µg/kg - micrograms per kilogram
µg/g - micrograms per gram
ng/g - nanograms per gram

5.4 Stormwater Quality

Impacts to stormwater quality occur when precipitation encounters pollutant-generating impervious surfaces (PGIS)(see Section 4.5). PGIS are defined as surfaces that are considered a significant source of pollutants in stormwater runoff and include, but are not limited to:

- highways, including non-vegetated shoulders

- streets, including contiguous sidewalks, and driveways
- bus layover facilities, surface parking lots, and the top floor of parking structures

Runoff from PGIS is typically associated with a suite of pollutants, including suspended sediments, nutrients (nitrogen and phosphorus), PAHs, oils and grease, road salt and deicing agents, antifreeze from leaks, cadmium, copper, lead and zinc from tire, engine parts, and brake pad wear.[15] Fecal coliform, while not a product of roadway surfaces or activities, is known to be conveyed in road runoff.[16] The concentration and load of these pollutants are affected by a number of factors, including traffic volumes, adjacent land uses, air quality, and the frequency and duration of storms. Limited information is reliably available on stormwater quality conditions within the study area.

[15] The Columbia River is not on the 303d list for any pollutants of particular concern that are associated with highway runoff, nor has a TMDL been established for any pollutant associated with highway runoff.

[16] Burnt Bridge Creek is on the 303d list for fecal coliform.

6. Evaluation of Potential Environmental Effects to the TSSA

This section presents the methods and the findings for the sole source aquifer (TSSA) evaluation. As requested by EPA, the evaluation addressed the potential for exacerbation of contaminants from 1) future pile driving activities in areas potentially containing contaminated sediments, soils or groundwater; and 2) significant below-grade construction activities in areas in proximity of known or suspected hazardous materials sites (EPA 2008).

6.1 Methods

The following methods were used to help evaluate potential adverse effects to the TSSA from bridge crossing, roadway, and transit construction activities. The evaluation was conducted in four steps: 1) rank or prioritize hazardous material sites; 2) conduct a file review of key hazardous material sites with known environmental conditions; 3) map the geospatial relationship of proposed improvements, water supply wells and priority hazardous material sites; and 4) evaluate the potential for adverse effects to the TSSA from project activities.

Methods for each step are described below. Methods for steps 1 and 2 are consistent with WSDOT Guidance and Standard Methodology for WSDOT Hazardous Material Discipline Reports (WSDOT 2009).

6.1.1 Ranking of Hazardous Material Sites

Identified hazardous material sites were ranked qualitatively for their potential to act as a contaminant source. Ranking was based on the following criteria:

- Location of the site (in or out of the study area and/or API)
- Type and number of database listings
- Occurrence of a known or suspected release of a hazardous substance(s)
- Status of cleanup – Active or Inactive[17]

Databases types were compared relative to one another on their ability to signify that an adverse environmental condition exists.[18] Comparisons of database types are presented below, with those at the beginning of the list having the greatest potential relative to those at the end of the list.

[17] All sites are considered active unless identified as having no further action or inactive status.

[18] Comparisons are based on WSDOT guidance, available data, and best professional judgment.

Occurrence of a Known or Suspected Release to the Environment

- NPL, CERCLIS, ROD, TRIS, and SHWS database listings indicate that a relatively significant adverse environmental condition exists. These database listings signify sites that have had a confirmed release(s) to the environment, and may require or are in the process of cleanup.
- IRC, RAATS, VCP, and LUST database listings indicate that an adverse environmental condition exits. These sites have a confirmed or suspected release(s) to the environment and may require or are in the process of cleanup. LUST sites associated with fueling stations may pose a greater threat than those associated with home heating oil due to the use of fuel additives and the quantities stored.
- ENGG CONTROLS and INST CONTROLS database listings indicate a formal control is in place that may pose limitations or constraints set on property use.
- Delisted-NPL, CERCLIS-NFRA, CSCS-NFA, and Inactive Drycleaners database listings indicate sites that have had or were thought to have an adverse environmental condition, however these sites have an inactive status.
- SPILLS, HAZMAT, ERNS, and HMIRS DOT OPPS database listings indicated incidences of vehicle accidents with fuel spills and transported material spills that may produce environmental consequences depending on their nature and extent.

Sites with No Reported Release

- UST and AST database listings have limited potential for producing significant adverse environmental conditions. UST sites that are acquired would require proper decommissioning.
- RCRIS, RCRA-TDSF, RCRA-NLR, CORRACTS, TSCA, PADS, FTTS: HIS-TFTTS, SSTS, SWL-LF, and MANIFEST database listings indicate sites where hazardous substances that are stored on the property would need to be properly removed and/or disposed. These sites have limited potential for producing significant environmental consequences.

Long Term Environmental Monitoring

- ICIS, NPDES, and AIRs database listings have limited potential for producing significant environmental consequences depending on industry type. However, adverse environmental consequences maybe associated with sites that have multiple NPDES violations.
- FINDS sites have limited potential for producing significant environmental consequences.

Using database listings types, site status and location, hazardous material sites were ranked on a relative scale of 0 to 5 (low to high) for being a potential source of contamination within the study area. A description of each ranking is provided below.

Sites were ranked using available information on database type, site status, and site location.[19]

- #0 – Identified site is located outside of the study area and is not suspected of having a release.
- #1 – Identified site is outside of the study area and is known or suspected of having a release.
- #2 – Identified site is within the study area and is not suspected of having a release.
- #3 – Identified site is within the API and is not suspected of having a release.
- #4 – Identified site is within the API and has had a known or suspected release; however, no further action is required or pending.
- #5 – Identified site is within the API, has had a known or suspected release, and is active.

Sites with a #4 and #5 rank pose the greatest potential to be a source of contamination within the study area.

6.1.2 File Review

A file review was conducted on selected hazardous material sites with rankings of #4 or #5. The file review was conducted at the Ecology Southwest Regional Office in Olympia, Washington, on February 24, 2009. The file review provides further details on the site's existing environmental conditions. These details include, but are not limited to, verifying site location, gaining an understanding of the nature and extent of contamination, and site status. The file review was not a comprehensive review of site conditions, but rather focused on relevant and applicable information for this evaluation.

6.1.3 Plotting the Location of Proposed Improvements and Higher Priority Hazardous Material Sites

Available geospatial information was used to plot the locations of the proposed improvements and identified higher priority hazardous material sites. Geospatial information for the hazardous material sites is approximate, and does not define the exact location or extent of contamination, if any.

6.1.4 Evaluate Potential Adverse Effects to the TSSA

Potential environmental effects to the TSSA were evaluated by comparing and contrasting the location and the intensity of the construction activity with identified hazardous material sites that have a ranking of #4 or #5. The term *intensity* is used to refer to the type and degree of construction activity, such as the number and depth of foundation piles or excavation work. Based on this qualitative evaluation, the potential of

[19] A site is considered to be active unless otherwise indicated by the database or file review. Although a site is designated inactive, it may be subject to or be open to further inquiry by state or federal regulators.

adverse effects to the TSSA from construction activities associated with each bridge structure is rated on a scale of low, moderate, or high.

6.2 Findings

6.2.1 Hazardous Material Sites Ranking Results

A summary of hazardous material site ranking results is displayed on Exhibit 6-1. The table indicates that out of the 122 sites identified, 24 have a ranking of #4, and 1 has a ranking of #5.

In general, the #4 sites were within the API and had a known or suspected release of a hazardous substance or petroleum product, but these sites are currently inactive or have received a no further action notice. Further review indicates that these releases typically stemmed from a leaking underground storage tank (LUST) or spill. The only site to be ranked #5 was the Boise Cascade Site (No. 9). Environmental conditions at this site are discussed further below.

6.2.2 File Review Results

Based on the ranking results, a file review was performed on the following eight hazardous material sites.

Site ID No. 9, Boise Cascade White Paper – 907 W 7th Street

- Site is listed in the HWS, PADS, FINDS, RCRA-LQG, MANIFEST, AIR EMISSIONS (EMI), and UST databases. The eastern portion of this site borders anticipated construction areas for the transit bridge and the traffic bridge. Bridge construction in this area may require foundation below the water table to support the anticipated vertical loads.

According to Ecology's records, a site investigation and remedial action were conducted in 2005 (CH2M Hill 2006). The investigation identified three areas of the site where soil samples exceeded screening values for petroleum and metal contamination. These areas are located around the center of sawmill operations at the site. The main area for former operations is located approximately ¼ mile from anticipated construction areas. Soil in these areas of concern was removed from the site, and confirmation sampling indicated that levels of contaminates at the site were below cleanup levels.

Groundwater impacts from petroleum products were noted at the very western edge of the site. The report indicated the possibility of an off-site source of product encountered in groundwater to the Albina Fuel facility located more than ½ mile from anticipated CRC construction activities.

Exhibit 6-1
Summary of Ranked Hazardous Material Sites

MAP ID	NAME	Location				Known or Suspected Release		Site Status		RANK
		Study Area		API						
		Out	In	Out	In	Yes	No	Inactive	Active	
1	HILLMAN PROPERTIES NORTHWEST MARITIME	X		X			X			0
2	HILLMAN PROPERTIES	X		X		X		X		1
3	QUAD INVESTMENTS		X		X		X			2
4	FRONTIER HARDCHROME	X		X		X			X	1
5	111 E COLUMBIA WAY		X		X		X			2
6	100 COLUMBIA ST		X		X	X		X		4
7	HANNAH MOTOR COMPANY		X		X	X		X		4
8	3RD / WASHINGTON		X		X	X		X		4
9	BOISE CASCADE WHITE PAPER LLC		X		X	X			X	5
10	CAPITAL TACKEL MFG		X		X		X			2
11	HANNAH MOTOR COMPANY UST 9879		X		X		X			2
12	US DOT FEDERAL HIGHWAY ADMINISTRATION		X		X	X		X		4
13	PACIFIC CHEMICALS ENGINEERING		X	X			X			2
14	FROM THE KENNELS		X		X		X			2
15	HANNAH MOTOR CO		X		X		X			2
16	ADMIRAL DISTRIBUTING		X		X		X			2
17	515 WASHINGTON STREET		X		X		X			2
18	FAULKNER USA		X		X		X			2
19	VANCOUVER BARRACKS		X		X	X		X		4
20	HANNAH MOTOR COMPANY VW		X		X		X			2
21	SOUTHWEST DELIVERY CO INC		X		X	X		X		4
22	LUCKY LAGER BREWERY		X		X		X			2
23	VANCOUVER CITY 6TH ST		X	X			X			2
24	HANNAH MOTOR CO BODY SHOP		X	X			X			2
25	VANCOUVER ICE & FUEL		X	X		X		X		3
26	130 WEST 8TH STREET		X		X	X		X		4
27	COLUMBIAN PUBLISHING CO		X	X			X			2
28	VANCOUVER CITY BREWERY BLOCKS		X		X	X		X		4
29	PORT OF VANCOUVER 058720-000		X	X		X		X		3
30	EOFF ELECTRIC CO		X	X			X			2
31	PRI NORTHWEST INC VANCOUVER		X	X		X			X	3
32	PACIFIC TELECOM CORP OFFICE		X		X		X			2
33	GENERAL BREWING COMPANY		X		X		X			2
34	VANCOUVER WELDING SUPPLY CO		X	X			X			2
35	BILL COPPS INC		X		X		X			2
36	METRO BUICK OLDS VANCOUVER		X		X	X		X		4
37	FORT VANCOUVER PLYWOOD	X		X		X			X	1

Exhibit 6-1
Summary of Ranked Hazardous Material Sites

MAP ID	NAME	Location				Known or Suspected Release		Site Status		RANK
		Study Area		API						
		Out	In	Out	In	Yes	No	Inactive	Active	
38	AUTOMOTIVE SERVICES INC	X		X		X			X	1
39	WA STATE PATROL VANCOUVER		X		X		X			2
40	ACTION CAMERA		X		X		X			2
41	ACADEMY		X		X		X			2
42	MARSHALL VANCOUVER FORD		X		X		X			2
43	WOLF SUPPLY CO VANCOUVER		X		X		X			2
44	1104 MAIN STREET		X		X	X		X		4
45	HEGEWALD INC		X	X			X			2
46	CLARK COUNTY JUVENILE DEPT		X	X			X			2
47	PORTSIDE LAGOON AND LANDFILL	X		X		X			X	1
48	AT&T WIRELESS DOWNTOWN VANCOUVER		X		X		X			2
49	OLTMANNS MOBIL SERVICE		X		X		X			2
50	CLARK CNTY PUD LOWER RIVER RD		X		X		X			2
51	EMERALD PETROLEUM SERVICES VANCOUVER		X	X		X			X	3
52	VANRICH CASTING		X	X		X		X		3
53	FORT VANCOUVER REGIONAL LIBRARY		X		X		X			2
54	VANCOUVER POLICE BUILDING		X		X		X			2
55	UNKNOWN		X		X	X		X		4
56	CLARK COUNTY CORRECTION CENTER		X	X			X			2
57	ROYAL APTS		X	X			X			2
58	BRAZIER FOREST INDUSTRIES	X		X		X			X	1
59	VANCOUVER CHEVRON		X		X		X			2
60	QC CLEANERS		X		X		X			2
61	CHUCK'S TIRE & AUTO SERVICE		X		X	X		X		4
62	CLARK COUNTY PUBLIC WORKS		X	X			X			2
63	CLARK COLLEGE		X	X		X		X		3
64	VANCOUVER ENGINE EXCHANGE		X		X		X			2
65	KYUNGSHIN CHOI MATTHIEUS CAR CARE/GEM EQUIPMENT		X		X	X		X		4
66	WASTE MANAGEMENT OF VANCOUVER		X	X			X			2
67	PINKERTONS AUTO REPAIR		X		X		X			2
68	MCLOUGHLIN BLVD / FORT VANCOUVER WAY		X		X	X		X		4
69	NUSTAR ENERGY LP	X		X		X			X	1
70	BENNETT PAPER & SUPPLY INC		X		X		X			2
71	SERVICE BATTERIES		X		X		X			2
72	16TH / BROADWAY		X		X	X		X		4
73	HOLLAND BURGERVILLE PROPERTY		X		X		X			2

Exhibit 6-1
Summary of Ranked Hazardous Material Sites

MAP ID	NAME	Location				Known or Suspected Release		Site Status		RANK
		Study Area		API						
		Out	In	Out	In	Yes	No	Inactive	Active	
74	SHOP INC DBA LARKINS GARAGE		X		X		X			2
75	DON LORENTZ & ASSOCIATES		X		X		X			2
76	SHERWIN WILLIAMS CO VANCOUVER		X		X		X			2
77	ESTATE OF MARY E MACKAY		X		X		X			2
78	VANCOUVER CITY MARSHALL CENTER		X		X		X			2
79	HOESLY AUTO SERVICE		X		X	X		X		4
80	SAMS AUTO BODY		X		X		X			2
81	214 E MCLOUGHLIN BLVD		X		X	X		X		4
82	VELMA B JORDAN		X		X		X			2
83	CITY OF VANCOUVER		X		X	X		X		4
84	COLUMBIA OIL		X		X	X		X		4
85	MALCOLM MONTAGUE	X		X		X			X	1
86	SECURE UNDERGROUND LLC		X		X	X		X		4
87	PINNACLE INC		X	X			X			2
88	ASTRO MINIT MART 730		X	X		X		X		3
89	VANCOUVER WATER STATION #1 CONTAMINATION		X	X		X			X	3
90	USWCOM VANCOUVER OXFORD CO		X	X			X			2
91	PHOENIX 120 GRANT ST PROPERTY		X	X		X		X		3
92	TIRES UNLIMITED		X	X		X		X		3
93	DEPT OF VETERANS AFFAIRS		X		X	X		X		4
94	VA MEDICAL CENTER VANCOUVER DIVISION		X		X		X			2
95	CLARKES EUROPEAN AUTO REPAIR		X	X		X		X		3
96	VANCOUVER CITY UST 101305		X	X			X			2
97	SHULL PROPERTY		X	X		X			X	3
98	CRITES PROPERTY		X	X		X			X	3
99	QUICK SHOP MINIT MART #28		X	X		X		X		3
100	CLIFF KOPPE METALS INC	X		X		X			X	1
101	CASCADE AUTO BODY		X	X		X		X		3
102	FIRST UNITED METHODIST CHURCH		X	X			X			2
103	SOUTHWEST WASHINGTON MEDICAL CENTER		X	X		X		X		3
104	DEGAGNE PROPERTY		X	X		X			X	3
105	TIME OIL CO ST JOHNS BLVD		X	X		X		X		3
106	RUDYS RELIABLE AUTO CARE		X	X			X			2
107	HIDDEN BROTHERS		X		X		X			2
108	ARCO 5739		X	X			X			2
109	E 39TH / NE 15TH AVE		X		X	X		X		4
110	BBC PETRO GROUP INC/76 24 HR FOOD MART		X	X		X		X		3

Exhibit 6-1

Summary of Ranked Hazardous Material Sites

MAP ID	NAME	Location				Known or Suspected Release		Site Status		RANK
		Study Area		API						
		Out	In	Out	In	Yes	No	Inactive	Active	
111	WA DOT VANCOUVER		X	X		X			X	3
112	TIME OIL HANDY ANDY 8	X		X		X			X	1
113	CALHOUN PROPERTY	X		X		X			X	1
114	HUNTINGTON PROPERTY	X		X		X			X	1
115	5009 NE HAZELDELL AVE		X		X	X		X		4
116	US DOE BPA ROSS COMPLEX	X		X		X			X	1
117	JUMBOS CAR WASH & GAS	X		X		X			X	1
118	HAZEL DELL AUTO CARE CENTER	X		X		X			X	1
119	PORT OF VANCOUVER 058720-000	X		X		X			X	1
120	Special Events & Convention Center		X		X	X		X		4
121	VANCOUVER SUB INSTALLATION		X	X			X			2
122	US ARMY VANCOUVER BARRACKS		X	X		X		X		3

Summary of Site Ranking Results

Total	122
0 =	1
1 =	16
2 =	59
3 =	21
4 =	24
5 =	1

Site ID No. 11, Hanna Motor Company – 300 and 400 Washington Street

- Site is listed in the LUST, UST, ICR, FINDS, and RCRA-NLR databases. The site is located in an area that is planned for the transit bridge to enter Vancouver. Bridge construction in this area may require foundation below the water table to support the anticipated vertical loads.

According to Ecology's records, 300 Washington Street contained two USTs. One 300-gallon waste oil UST was decommissioned by removal on October 20, 1993. During decommissioning, soil contamination was encountered and 12.9 tons of contaminated material were excavated and replaced with imported fill. Groundwater was reported to not be impacted by the waste oil release (Enviro-Logic 1993). A 2,000-gallon gasoline UST was removed from the site on May 14, 1990. A site assessment was conducted and contamination was not reported during removal. A 2,000-gallon gasoline UST was removed from the 400 Washington Street property on August 27, 1990. A site assessment was conducted and contamination was not reported during removal. The location of this UST was not recorded in the Ecology documents reviewed.

In a letter to Hanna Dealerships, an investigation discovered that a vehicle wash rack at the site discharged into a drywell in the rear parking lot. Senior employees reported that in years past they used to dump used oil into the drywell. Soil sampling indicated that all the storm drains on the property and the drywell tested positive for contamination. The letter did not state which type of contaminants were encountered. Additional information on the current state of the drywell or if groundwater was impacted was not discovered in the file review.

Site ID No. 12, U.S. DOT Federal Highway Administration – 610 E 5th Street

- This site is listed in the LUST, UST, RCRA-NLR, and FINDS databases. This site is located in an area that may require below-groundwater construction to support retaining walls or bridge abutments.

In a letter report to Ecology, a 3,000-gallon unleaded gasoline UST was removed from the west end of the facility building in February 1990 (CH2M Hill 1990). The letter indicates that approximately 100 gallons of fuel were extracted from the tank prior to removal. Once the tank was pulled from the tank pit, a visual identification of petroleum-impacted soil was made. Soil samples collected from the excavation indicated concentrations of gasoline between 16 and 18 mg/kg. The excavation was backfilled with excavated material and clean imported fill. Groundwater was not encountered during the excavation.

The Ecology records also indicate significant quantities of TCE were generated by the facility in the late 1980s and early 1990s. In 1985, the site generated 15,000 pounds of a TCE mixture. Although no release of this material is reported, the quantities of the material generated and the proximity of the site to anticipated construction are reason for care to be exercised during construction activities near this site.

Site ID No. 19, Vancouver Barracks – Hathaway Road BLDG 404

- Site is listed in the LUST and UST databases. This site is approximately located in an area that may require below-groundwater construction to support retaining walls or bridge abutments.

The information provided on the existing conditions at the Barracks site does not provide a clear picture of site conditions. The building numbers are not listed, and the physical location of the buildings in the reports provides inadequate location information. Information reviewed suggests that 15 USTs have been removed from the site. No details are provided on all of the tanks.

Available information indicates that a 50-gallon UST and a 500-gallon used oil UST were removed from BLDG 404. Reportedly the 50-gallon tank was never used. Other information indicates that three USTs were removed in March 1992 from the vicinity of BLDG 748. One 6,000-gallon diesel tank, one 1,000-gallon gasoline tank, and one 1,000-gallon fuel oil UST were removed from BLDG 748. During removal of the fuel oil tank, indications of overfills and small holes in the tank led to the discovery of petroleum-impacted soil. Approximately 100 cubic yards of contaminated soil were removed from the tank pit located on the north side of the building.

Site ID No. 89, Vancouver Water Station #1 – 2103 E. Reserve Street

- Site is listed in the CERCLIS, NPL, ENG CONTROL, RODS, and FINDS databases. This site is located approximately ½ mile east of planed construction areas.

The file review indicates that one 1,000-gallon UST and one 350-gallon gasoline UST were removed from the site in December 1990. No release was reported.

In 1988, the City of Vancouver discovered low levels of tetrachloroethene (PCE) and other volatile organic compounds (VOCs) in some of the wells at Station #1. In 1992, the concentrations of PCE in some individual wells exceeded the federal drinking water standard. Site inspections in 1990 and 1991 could not determine the source of contamination. In response to increasing levels of contamination, the City of Vancouver installed a groundwater treatment system. Five air stripping towers were built and began removing contaminants from the groundwater in the summer of 1993.

EPA signed a Record of Decision for this site in September 1998 to continue operation of the existing air stripping treatment system. In the ROD, the site was designated as construction complete. This signifies all remedies required for the site have been implemented.

The Second Five Year Review was conducted and completed in September 2008. This review determined that the remedy remains protective of human health

Site ID No. 93, Department of Veterans Affairs – 1601 E. 4th Plain

- Site is listed in the LUST database. This site is located less than ¼ mile away from construction; however, the inclusion of the site in the LUST database and active cleanup status was cause for additional investigation on the site.

The UST files indicate that a 500-gallon gasoline tank was decommissioned by removal at the site in October 1996. Information regarding the LUST incident was not provided.

Site ID No. 111, Washington Department of Transportation Maintenance Facility – 4200 Main Street

- Site is listed in the UST, FINDS, RCRA-NLR, HWS, and MANIFEST databases. This site is located less than ¼ mile away from construction; however, the inclusion of the site in the HWS database and groundwater impacts were cause for additional investigation on the site.

The UST files indicate that a 10,000- to 20,000-gallon gasoline tank and a 5,000- to 10,000-gallon diesel tank were installed at the site in July 1987.

In a Environmental Report Tracking System (ERTS) file, a spill at the site was reported in April 1997 due to improper procedure. Soil and groundwater contamination by heavy oil were confirmed. No other details were provided in the record.

The removal of a hydraulic lift from the maintenance shop encountered soil and groundwater contamination of the hydraulic oil. Approximately 40 cubic yards of contaminated soil were removed 10 to 15 feet bgs. Groundwater was encountered at approximately 14 feet and oil sheen was observed. Excavation of impacted soil was stopped due to the potential for undermining the building foundation. Two soil samples were collected to characterize the contaminated soil left in place. Analytical results indicate the contamination left in places is approximately 130 mg/kg of diesel and 650 mg/kg of heavy oil.

Site ID No. 120, Special Events and Convention Center – Between 4th and 6th Streets & Columbia and Ester

- Site is listed in the HWS, VCP, and INST CONTROL databases of the EDR orphan list. The site is located approximately 250 feet from the transit bridge and the traffic bridge. Bridge construction in this area may require foundation below the water table to support the anticipated vertical loads.

Several investigations conducted on the site discovered eight USTs, an oil water separator, and a drywell. Sampling at the site detected petroleum and metals contamination in soil and groundwater. In 1989, two 10,000-gallon diesel USTs, one 6,100-gallon gas UST, one 500-gallon waste oil UST, and an oil water separator were discovered on Block 25 south of 4th Street and west of Columbia. Low to moderate concentrations (390 to 3,200 mg/kg) of petroleum products, and moderate to high concentrations (150 to 3,100 mg/kg) of metals were detected in surface soils across the site. Petroleum was detected in groundwater at a concentration of 33 µg/L (Dames and

Moore 1989). In 2002, four additional USTs were decommissioned by removal from the convention center area of the site south of 6th Street (AMEC 2003).

6.2.3 Mapping of Proposed Improvements and Hazardous Material Sites

Exhibit 6-2 displays the location of the six proposed bridge structures, water supply stations, and the 25 identified higher priority hazardous material sites. A majority of the hazardous material sites are located on the western side of downtown Vancouver, with the number of sites decreasing to the north.

6.2.4 Evaluation Results

Potential effects to the TSSA were evaluated for the five bridge structures, the Columbia Crossing Bridge, the SR-14 Bridges, the Evergreen Bridge, the Mill Plain & 33rd Street Bridges, and the SR-500 & 39th Street Bridges. Results of the evaluation are presented in Exhibit 6-3. The exhibit displays a rating for each bridge type based on construction attributes (number and depth of piers, and size of structure), depth to groundwater, distance to water stations, and higher priority hazardous material sites.

Based on this information a moderate rating for potential adverse affects to the TSSA was determined for the Columbia River Crossing, SR-14 Interchange, and Mill Plain & 33rd street Bridge; and a low rating was determined for the Evergreen Bridge and the SR-500 & 39th Street Bridge. These determinations were made because 1) there is no known or recognized source of contamination in proximity of the proposed bridge structures that would be exacerbated through construction activities, and 2) construction activities would not hinder any ongoing remedial investigations or cleanups.

A moderate rating for the Columbia River Crossing, the SR-14 Bridge, and the Mill Plain Bridge is based on:

- numerous permanent and temporary piles are to be installed,
- the piles installation depth is deep relative to groundwater depth,
- a high occurrence of excavations, and
- higher priority hazardous material sites are within 500 feet of the structures.

A low rating for the Evergreen Bridge and the SR-500 & 39th Street Bridge is based on:

- the number of piling installations are low,
- the pile installation depth is shallow relative to the depth of groundwater,
- a moderate occurrence of excavations, and
- no higher priority hazardous material sites are with 500 feet of the structures.

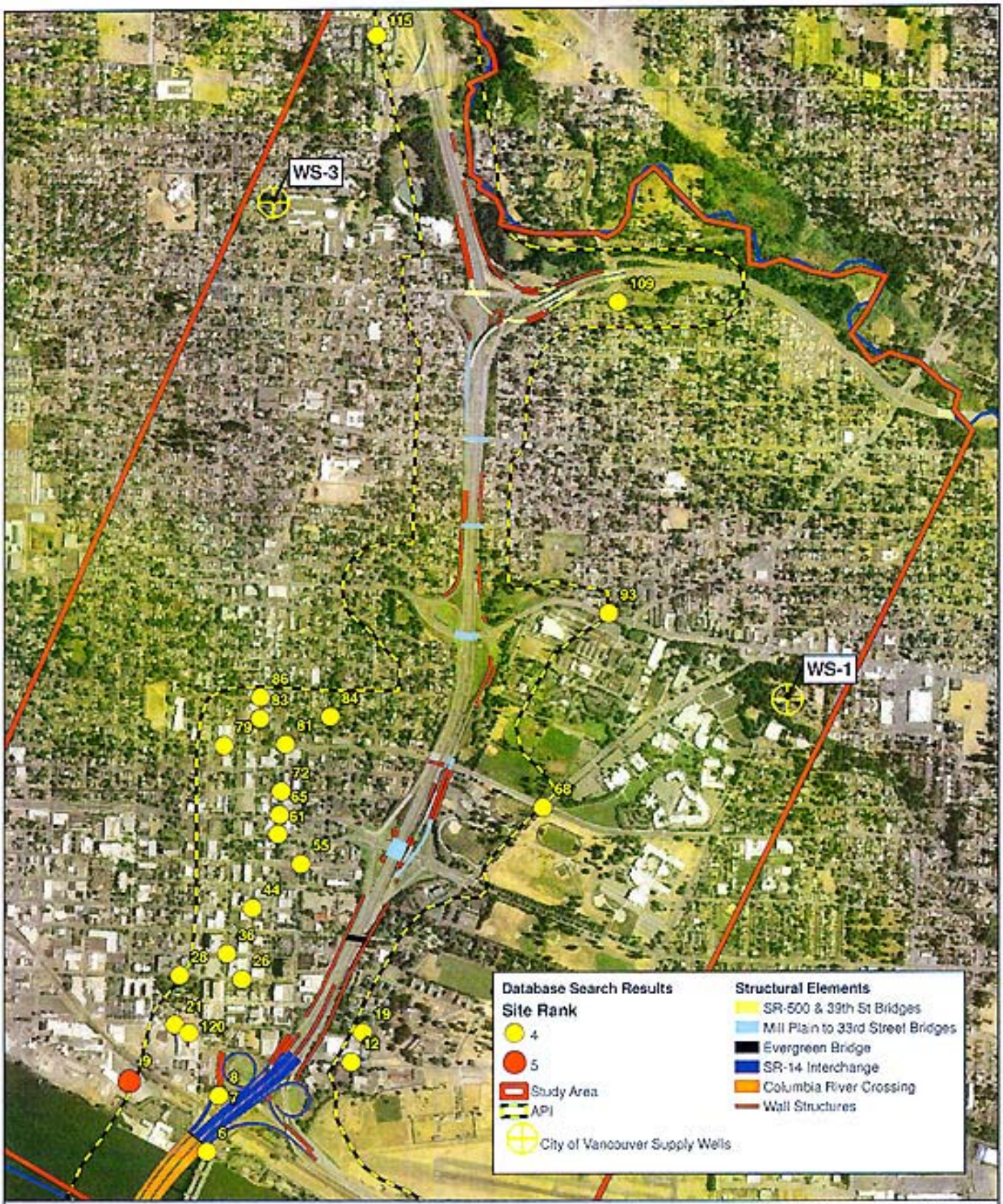

Exhibit 6-2: Hazardous Material Sites Ranked Greater than 4
Troutdale SSA Evaluation

Columbia River CROSSING

Exhibit 6-3: Results of Potential Affects to the SSA from Project Construction Activities
Columbia River Crossing Project

Infastructure Name	Area of Stucture	Foundation Type		Estimated Number of Piles	Estimated Pile Tip Depth Below Existing Ground/Mudline	Occurance of Excavations	Approximate Depth to Groundwater	Distance to City of Vancouver Water Station		Radial Distance of Improvement to Hazardous Material Sites with a Ranking of #4 or Greater		Rating of Potential Affect
	(sq. feet)	Shaft	Pile		(feet bgs)		(feet bgs)	WS-1 (feet)	WS-3 (feet)	(100 feet)	(500 feet)	
Columbia River Crossing [1]	1,031,990	X	X	60 to 120 piles 50 to 100 shafts	110 to 260	high	10	8,650	11,300	6, 7, 8	9	**MODERATE**
SR-14 Bridges [2]	494,405	X		170 to 210 shafts	120 to 130	high	10	7,800	10,675	7, 8	12, 21, 120	**MODERATE**
Evergreen Bridge [2]	19,723	X	X	90 to 160 piles 10 to 30 shafts	50 to 70	moderate	90	5,900	8,900	--	--	**LOW**
Mill Plain to 33rd Street Bridges [2]	178,189	X	X	130 to 240 shafts 440 to 740 piles	80 to 90	high	150	3,600	2,800	--	93	**MODERATE**
SR-500 Interchange & 39th Street Bridges [2]	66,275	X	X	20 to 40 shafts 150 to 260 piles	50 to 80	moderate	150	5,600	3,000	--	109	**LOW**

Map ID	Hazardous Material Site Name	Map ID	Hazardous Material Site Name
--	No site identified	12	FEDERAL HIGHWAY ADMINISTRATION
6	100 COLUMBIA ST	21	SOUTHWEST DELIVERY CO INC
7	HANNAH MOTOR COMPANY	93	DEPT OF VETERANS AFFAIRS
8	3RD / WASHINGTON	109	E 39TH / NE 15TH AVE
9	BOISE CASCADE WHITE PAPER LLC	120	Special Events & Convention Center

References

1 =Foundation data from Shannon & Wilson "Geotechnical Data Columbia River Crossing", March 5, 2008

2 = Foundation data from WSDOT Geotechnical Division, "I-5, XL-2268, MP 0.0 to 3.0 Columbia River Crossing Project Washington Landside Structures and Retaining Walls Conceptual Geotechnical Recommendations for Biological Assessment" Memorandum, November 5, 2008.

As requested by EPA, this determination considered the potential for exacerbation of contaminants from 1) future pile driving activities in areas potentially containing contaminated sediments, soils or groundwater, and 2) significant below-grade construction activities in areas in proximity of known or suspected hazardous materials sites (EPA 2008). The following activities were evaluated that could promote exacerbation:

Drag down – Exacerbation of contamination by drag down from piling installation is thought only to be viable if piling tips extended through a source area of contamination and into the water table or capillary fringe. Drag down is thought to have a limited potential for exacerbation because no known source area of contamination was identified, and the depth of groundwater is relatively deep (up to 150 feet below ground surface). If a shallow source of contamination is encountered during pile installation, the potential for drag down will need to be mitigated.

Conduits – Pilings have a potential to create conduits in the subsurface that could act as a preferential pathway for contaminant migration. A conduit may be formed in the annular space between the pile casing and the borehole wall, or if gaps or voids between the concrete and the borehole wall occur. This is particularly the case for well-cemented or fractured rock formations. However, the formation of conduits in the USA (Unconsolidated Sedimentary Aquifer) is thought to be limited because it is composed of loose sand with no confining units, and lack of bedding or structures (locally). During pile installation, sands would consolidate around the pile casing or concrete, so that voids or gaps are unlikely to form. Since the USA and TGA are in hydraulic communication with each other, preferred downward movement of low-concentration dissolved-phase contamination along the borehole wall is unlikely.

Excavation – Subsurface excavation will be conducted to support subgrade roadways, foundations, retaining walls, and utility corridors. Exacerbation of contamination could occur from stormwater runoff and erosion of open excavations or stockpiles, or allow the excavation to be a conduit for downward migration of contamination. Exacerbation of contamination from excavation will only occur if a shallow source of contamination is encountered. If a source of contamination is encountered, exacerbation of contamination from excavation will need to be mitigated. In addition, if dewatering occurs in contaminated areas, then contaminated water will need to be managed and mitigated.

Scour – Scour around piers could exacerbate contaminated sediment and affect water quality. Although sediments in the main channel are not thought to be contaminated, near-shore sediments in proximity to stormwater outfalls could be present. Scour of these sediments would not likely affect the TSSA, but could affect surface water quality. Contaminant exacerbation from scour is being mitigated in the Biological Assessment and as Part 404 permit for dredging.

Stormwater infiltration – Infiltration of stormwater into areas where contaminated sediment or soil exists could exacerbate contamination. Because a source of contamination was not identified, exacerbation is thought to be unlikely. However, if contamination is encountered, exacerbation of contamination from stormwater infiltration

will need to be mitigated. In addition, focused infiltration of stormwater from PGIS overtime may affect groundwater quality as the capacity of the soil material to absorb contaminants diminishes overtime. These potential impacts should be evaluated and mitigated.

6.3 Conclusions

Using available information on existing conditions for the hydrogeology of the TSSA, proposed construction activities for five bridge structures, and identified hazardous material sites, potential adverse effects to the TSSA from the project were evaluated. The evaluation determined that a low to moderate rating for adverse effects exists because 1) no known or recognized contaminant source is present in proximity to proposed construction activities, and 2) proposed construction would not hinder any ongoing remedial investigations or cleanup.

The evaluation recognizes that potential adverse affects to the TSSA could stem from exacerbation of existing unidentified contamination. Means of exacerbation through construction include, but are not limited to, drag down, formation of conduits, excavation, and stormwater infiltration. Of these, excavation and stormwater infiltration have the highest potential to exacerbate contaminants. Mitigation measures for these activities are necessary to help ensure the protectiveness of the TSSA. Although drag down and the formation of conduits have a potential to impact the TSSA, this potential is low unless significant contamination is encountered in the shallow subsurface soils.

7. Avoidance and Mitigation Measures

To help ensure the protectiveness of the TSSA, the following avoidance and mitigation measures will be implemented prior to construction and during construction activities. Measures may be added or modified as bridge designs are finalized, information on existing conditions is updated, or if changes in construction activities occur.

Measures are presented in a general order of occurrence:

Phase I Environmental Site Assessments – Phase I assessments, or equivalent, will be conducted on properties prior to acquisition to reduce the risk of legal and financial liability to the purchaser. The assessment is part of the due diligence process and typically includes review of agency files and permits, site inspection, historic land use review, and interviews with tenants and owners. Information from the Phase I assessment will be used to help guide future environmental decisions for the property. If findings from the Phase I assessments indicates hazardous substances or petroleum products have been stored or released on the property, then a Phase II Environmental Site Assessment will be conducted.

Phase II Environmental Site Assessment – Phase II assessments will be conducted at identified sites to characterize the nature and extent of known or suspected contamination. Phase II assessments will be conducted in a manner that is consistent with applicable requirements of the Model Toxics and Controls Act (MTCA). The Washington State Department of Ecology will be notified if contamination is encountered during the assessment. Findings will be used to support avoidance strategy, or help guide appropriate cleanup actions.

Focused Environmental Site Assessments – Focused assessments will be conducted in areas where significant subsurface construction activities will occur or stormwater infiltration facilities will be placed to characterize existing environmental conditions. The focused assessment may consist of the collection and analysis of reconnaissance surface and subsurface soils, sediments and/or groundwater. Results from the focused assessments will be used to document existing conditions and evaluate the potential for contaminant exacerbation. If contaminant source is encountered, findings will be used to support an avoidance strategy, or help guide appropriate cleanup actions.

Drinking Water Supply and Treatment – In the event that contaminant exacerbation occurred, groundwater at WS-1 and WS-3 is currently treated for microbiological constituents by chlorination, and groundwater at WS-1 is treated for volatile organic compounds by aeration. Groundwater at these stations is monitored to ensure that water quality meets drinking water standards.

Contaminated Media Management Plans (CMMPs) – CMMPs will be prepared to properly characterize, manage, store, and dispose of contaminated materials encountered during construction activities. The CMMP will outline roles and responsibilities of

personnel; health and safety requirements; methods and procedures for characterizing, managing, storing and disposing of waste; and reporting requirements.

Health and Safety Plans (HASPs) – HASPs will be prepared to minimize exposure to construction and excavation workers and reduce the risk to human health and the environment.

Construction Stormwater Pollution Prevention Plans (SWPPPs) – Control plans will be prepared to prevent or minimize soil or sediment from being carried into surface water by stormwater runoff. Plans will be required for all permitted construction sites and are subject to approval from the Department of Ecology, and must comply with Vancouver Municipal Code 14.26. Plans will be prepared in a manner that is consistent to the Stormwater Manual for Western Washington, and will be put in place prior to clearing, grading, or construction.

Spill Control and Prevention Plans (SCPPs) – SCPPs will address the use, storage, and disposal of asphalt, fuel, raw concrete, striping paint, solvents, spray paint, landscaping chemicals, etc. SCPPs will be used to limit the generation and exacerbation of hazardous substances or petroleum products, and will outline best management practices (BMPs) to be used by contractors. Plans will be required for all permitted construction sites and are subject to approval from the Department of Ecology pursuant WAC 173-180. Ecology shall be contacted to determine if an NPDES stormwater construction permit is required.

NPDES Construction General Stormwater Permits – Permits will be prepared to cover all WSDOT construction activities disturbing more than 1 acre. Under the conditions of this permit, WSDOT must submit to Ecology a Notice of Intent (NOI) to discharge stormwater associated with construction activities and to meet stormwater pollution prevention requirements. Permits are subject to approval from the Department of Ecology pursuant WAC 173-220.

Update and Modifications to the Permanent Stormwater Conveyance System and Treatment Facilities – Existing stormwater conveyance system has limited ability to control flow and treat stormwater from pollutant generating impervious surfaces (PGIS) associated with roadways and bridges. Updates and modifications to the stormwater conveyance system will improve stormwater quality generated from PGIS. Improved stormwater quality is thought to help improved surface water and groundwater quality overtime.

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APPENDIX A

Basis of Action

From:	Reichgott.Christine@epamail.epa.gov
To:	Draft EIS Feedback;
CC:	Somers.Elaine@epamail.epa.gov;
Subject:	EPA Comments
Date:	Tuesday, July 01, 2008 6:20:12 PM
Attachments:	CRC 7 1.doc

Hello Heather,
Our comments are attached. We would very much like to meet with you and others who are most closely associated with the subjects in our comments for further discussion at your convenience. Thank you!

(See attached file: CRC 7 1.doc)
~*

Teena Reichgott, Manager
NEPA Review Unit ETPA 088
Office of Ecosystems, Tribal and Public Affairs
EPA Region 10
1200 Sixth Avenue, Suite 900
Seattle, WA 98101
206-553-1601

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue, Suite 900
Seattle, Washington 98101-3140

July 1, 2008

Reply to
Attn of: ETPA-088

05-052-FHW

Mr. John McAvoy, PE, Major Projects Manager
Federal Highway Administration
Western Federal Lands Building
610 E. 5th St.
Vancouver, Washington 98661

Ms. Linda Gehrke, Deputy Regional Administrator, Region 10
Federal Transit Administration
915 Second Avenue, Suite 3142
Seattle, Washington 98174

Dear Mr. McAvoy and Ms. Gehrke:

The U.S. Environmental Protection Agency has reviewed the Interstate 5 Columbia River Crossing Project Draft Environmental Impact Statement (DEIS) and Draft Section 4(f) Evaluation. We are submitting comments in accordance with our responsibilities under the National Environmental Policy Act (NEPA) and Section 309 of the Clean Air Act.

The Columbia River Crossing (CRC) DEIS is a bridge, transit, and highway improvement project proposed by the Oregon and Washington Departments of Transportation (ODOT and WSDOT), Southwest Washington Regional Transportation Commission (RTC), Metro, Clark County Public Transportation Benefit Area (C-TRAN), and Tri-County Metropolitan Transportation District (TriMet) to improve safety and mobility in the I-5 corridor between Portland, Oregon and Vancouver, Washington. The CRC project is focused on a five mile segment of the I-5 corridor from SR 500 in Vancouver to approximately Columbia Boulevard in Portland. The alternatives include the No Action alternative and four multi-modal action alternatives. The action alternatives each contain similar highway improvements, high capacity transit in the form of either Light Rail Transit (LRT) or Bus Rapid Transit (BRT) with several transit alignment and length options, and either replace or supplement the existing bridges over the Columbia River. Each action alternative also improves bicycle and pedestrian facilities, considers tolling on the bridges, and implements transportation system management and demand measures (TSM and TDM).

EPA is generally supportive of this project, however we have concerns about certain aspects of the project as represented in the draft EIS. EPA commends the project proponents for proposing a multi-modal project and tolling along with Transportation System Management and Transportation Demand Management (TSM/TDM) measures. These are positive steps to reduce single occupancy vehicle (SOV) travel as well as to expand, diversify, and help to fund the transportation system. We also appreciate being involved in the InterCEP process, where, to the extent resources allowed, we offered comments regarding several natural resource aspects of the project. Our scoping comment

letter of 12/14/05 identified additional points of interest for EPA. As a result of our review, we are primarily concerned about:

- The need for more information about potential impacts to groundwater and the Troutdale Sole Source Aquifer, particularly from pile driving activities in waters containing contaminated sediments, construction in hazardous materials sites, and routine excavation and construction activities.

- The need for project-related air quality analysis, particularly for near roadway concentrations of, human exposures to, and potential health effects from air toxics, diesel exhaust and particulate matter. Susceptible individuals and populations and sensitive receptor locations were not identified, and no mitigation is proposed.

- The need for identification, analysis, disclosure and mitigation for potential disproportionate environmental and human health impacts to low income and minority populations and communities residing in and near the project area.

- The need for more information regarding impacts to aquatic resources, including stormwater and construction-related impacts to water quality, 303(d) listed streams, and subsistence fishing uses.

We have additional concerns regarding the potential impacts resulting from land use changes and reduced travel times. More detailed discussion is provided in the enclosure. Based on the issues identified above, we have rated the EIS and each of its alternatives as EC-2, Environmental Concerns, Insufficient Information. An explanation of this rating is enclosed.

EPA thanks the Columbia River Crossing Environmental Office for meeting with us on June 10, 2008, and we thank the Federal Transit Administration, the Federal Highway Administration, and the CRC Office for the June 18, 2008 conference call with us to discuss environmental justice and related issues. We look forward to continued dialog to resolve outstanding issues. We are hopeful that our continued collaboration will result in a project that offers exceptional benefits for transportation as well as the human and natural environment.

If you have questions or would like to discuss our comments, please contact me at (206) 553-1601 or at reichgott.christine@epa.gov, or Elaine Somers of my staff at (206) 553-2966 or at somers.elaine@epa.gov. Thank you for the opportunity to be involved in this important project.

Sincerely,

Christine B. Reichgott, Manager
NEPA Review Unit

Enclosures

cc: Ms. Heather Gundersen, CRC Environmental Manager

U.S. Environmental Protection Agency
Detailed Comments on the
I-5 Columbia River Crossing Draft EIS

Groundwater

The CRC DEIS has limited information on the groundwater system underlying the proposed project, including information about the federally designated Troutdale Sole Source Aquifer and about groundwater underlying the Oregon portion of the project area. It is important to disclose in the EIS that for a designated Sole Source Aquifer, the Safe Drinking Water Act states that "...no commitment for federal financial assistance (through a grant, contract, loan guarantee, or otherwise) may be entered into for any project which the [EPA]Administrator determines may contaminate such aquifer through a recharge zone so as to create a significant hazard to public health, but a commitment for federal assistance may, if authorized under another provision of law, be entered into to plan or design the project to assure that it will not so contaminate the aquifer."

The Hydrology and Water Quality Technical Report mentions the Sole Source Aquifer and wellhead protection zones within the primary and secondary Areas of Potential Impact (APIs), and indicates that there may be temporary groundwater quality impacts from the construction of roadways or fixed guideways below-grade and close to the water table. The Report also states that the City of Vancouver has designated the entire area within the City boundary as a Critical Aquifer Recharge Area, and that no detailed analysis of the depth to water table within the project area has been conducted.

We are concerned that neither the Draft EIS nor the Technical Reports provide details regarding the physical environment of the aquifer and of the contamination risks. The discussion of potential groundwater impacts is equal in importance to the analysis of potential air and surface water impacts. It is important to provide this information in the EIS along with mitigating measures that will ensure the project is protective of the Sole Source Aquifer. As presented, the EIS does not enable EPA to make an informed evaluation of the potential impacts of the project on the groundwater resource.

Recommendations:

- In the Final EIS, include a section devoted specifically to groundwater, which includes the description of the Affected Environment, the impacts associated with the alternative and alignment options, and the environmental and human health effects of each.
- In the Affected Environment discussion for groundwater, describe the groundwater resources underlying the project area. In order to analyze potential impacts to groundwater and to the sole source aquifer in particular, the following information is needed: a figure that shows water level elevation contours of the area, cross sections depicting aquifer stratigraphy and water level depth, maps of any contaminant plumes known to exist in the area, and maps showing ground water flow directions. The project area should then be overlain on the figures and maps.
- We would suggest that the following information be included in the Environmental Consequences discussion for groundwater:
    - Maps of locations of all existing hazardous materials sites;

  - Maps showing existing ground water contamination;
  - Maps showing existing soil contamination;
  - Indicate whether there is a potential for an existing plume of contamination to be transported to a deeper part of the aquifer system as the holes are dug for the bridge pilings or other structures, or otherwise exacerbate the groundwater contamination issues in the project area;
  - A description of the impacts of the placement of bridge and overpass piers and pilings (indicate if there is a potential for contaminants to be transported from the soil or sediments into the ground water at any of these sites);
  - A map of existing wells, both private and public, and a description of the anticipated impacts on the wells and on the wellhead protection areas.
- Evaluate the groundwater impacts from all the proposed alternatives, including cumulative effects. Include in the ground water evaluation the specifics of existing contamination plume locations and proposed mitigation measures.

Air quality, Mobile Source Air Toxics

Operational impacts: The Draft EIS estimated operational emissions of all air pollutants from mobile sources for the four-county region and from four subareas or highway segments along the I-5 corridor. Based on the projected changes due to EPA regulations and fleet change over time, the EIS concludes (p. 3-277) that year 2030 emissions would be less than current conditions and the differences among alternatives would be unsubstantial. This regional scale air pollutant emissions discussion may be misleading since emissions at this scale do not necessarily correlate with ambient air quality. We believe that the Draft EIS needs to include additional information on the actual air quality effects of the project:

- The focus of the EIS should be on the change in air quality and clearly distinguish between project induced emission changes vs. changes caused by fleet turnover and more stringent new vehicle emission standards.
- The Draft EIS analysis focuses on emission trends that are not influenced by the project. It is difficult to provide meaningful disclosure of impacts of air pollutants through an evaluation of emissions alone. This approach dismisses the air quality impacts at the micro scale, meteorology and prevailing wind direction, topography, proximity of mobile sources to sensitive receptors, and the combined effects of other air pollution sources. The Portland Air Toxics Assessment demonstrates that there are tools available for this type of analysis.
- There is no analysis or disclosure of near roadway pollutants – their composition, concentrations, identification of the sensitive receptor locations and populations, and the associated potential human health effects[1]. This information would be particularly relevant to the communities and populations living within approximately 500 yards of the

[1] A large number of recent studies have examined the association between living near major roads and different adverse health endpoints. Several well-conducted epidemiologic studies have shown associations with cardiovascular effects, premature adult mortality, and adverse birth outcomes, including low birth weight and size. Traffic-related pollutants have been repeatedly associated with increased prevalence of asthma-related respiratory symptoms in children. Also, based on toxicological and occupational epidemiologic literature, several of the MSATs, including benzene, 1,3-butadiene, and diesel exhaust, are classified as known and likely human carcinogens. Thus, cancer risk, including childhood leukemia, is a potential concern in near roadway environments. For additional information on MSATs, please see EPA's MSAT website http://www.epa.gov/otaq/toxics.htm.

roadway, although the distance may vary depending on traffic and environmental conditions, and are hotspot in nature when there are localized concentrations.

Recommendation: Provide an analysis of project related air quality impacts in the Final EIS that is responsive to the above comments.

Construction impacts: One of the important findings of the Portland Air Toxics Assessment was the impacts of construction sites on micro scale air quality. These air quality effects can be significant. Air toxics emissions, particularly diesel exhaust, are known or suspected to cause cancer or other serious health effects, such as respiratory, neurological, reproductive, and developmental effects.

Recommendation: Include in the air quality section additional information on the duration, nature of, and special extent of construction impacts on air quality. Include a discussion of potential health impacts. Identify the affected populations and sensitive receptor locations.

There are now many opportunities to reduce the effects of project construction. Please see the Clean Construction USA website at http://www.epa.gov/otaq/diesel/construction/. At this website are examples of construction mitigation measures not included in the Draft EIS. The website also includes case studies and examples of institutional arrangements for implementing this mitigation.

Recommendation: Augment the construction mitigation measures listed in the Draft EIS to include additional mitigation measures listed on this website, and commit to their implementation.

There is also a Construction Sector within the West Coast Collaborative at http://www.westcoastdiesel.org, which is a public private partnership to reduce diesel emissions. The Construction and Distributed Generation Workgroup explores opportunities to share information and/or seek funding for a variety of projects including: using the NEPA review process to require construction emissions mitigation plans; contractual incentives, and providing incentive funding for smaller companies for pollution controls. Projects such as the Columbia River Crossing are encouraged to participate in this Workgroup.

Recommendation: Participate in the Construction and Distributed Generation Workgroup to share information, and help to advance additional means to mitigate construction emissions.

Correction to text: A correction is needed on page 3-274, where the text states that "No regional conformity analysis is required for the Vancouver area."

Recommendation: Revise the above language to state, "No regional emissions analysis for conformity is required for the Vancouver area."

Environmental Justice

The CRC project would potentially result in direct and indirect impacts to project area residences, businesses, and neighborhoods, which meet the criteria under Executive Order 12898 on Environmental Justice as being inhabited predominantly by low income and minority populations. Affected neighborhoods also include those that have unusually high populations of elderly and disabled residents. Children are also present throughout these communities, but they do not appear to have been accounted for in the demographic analysis of the EIS. Due to the diverse, largely disadvantaged, multi-cultural, and multi-lingual characteristics of the affected populations, neighborhoods, and communities, and because the project has the potential to exacerbate conditions that are currently affecting human health and well being in the project area, EPA believes that extra measures may be necessary to ensure effective public participation and sufficient and appropriate mitigation for project impacts.

We have environmental justice concerns primarily related to human health and safety, which are both project specific and cumulative in nature. These include air quality, noise, and neighborhood safety, particularly for children, the elderly, and the disabled. We also note potential impacts to community resources and the disproportionate economic burden to low income, elderly, disabled, and minority communities posed by current and potential future property impacts, potential human health effects, taxes, and tolls. We believe that that the potential mitigation concepts presented in the Draft EIS may not go far enough to address the magnitude and scope of potential impacts to these disadvantaged neighborhoods.

Our Environmental Justice concerns with the Draft EIS are that:

- The direct and indirect environmental, human health, social, and economic project impacts would likely affect the low income, minority, elderly, and disabled populations disproportionately as compared to populations that reside outside the project area and throughout the region.
- Some potential impacts, that could be significant, are not identified in the EIS.
- Analysis, disclosure, and mitigation for many impacts of the proposed project appear insufficient. As a result, the project may exacerbate conditions that are currently affecting human health and well being in the project area (such as air pollution, noise, financial stress, construction zone traffic, safety hazards, and health effects, potential contamination of drinking water and subsistence food supplies);
- Citizen allegations and documentation indicate that there is concern that the public participation process, while extensive in nature, may not have fully engaged and informed affected populations so that they feel they are well informed, involved, heard, and responded to in project development, implementation, and operation.

Census demographics: Two vulnerable populations are identified in the census demographics exhibit, "disabled" and age 65 or older. There has been no mention of children. The schools, (but not the childcare centers), in the project area were identified but there was no indication of how these vulnerable populations might be impacted by air pollution, noise, diesel construction vehicles, increased traffic, and other activities. Key to the vulnerable population

discussion is health information. For example, the asthma rate for the school age population should be disclosed. Specific information of this nature with details on potential impacts can provide a better sense of where the impacts are actually occurring and who, which racial minority, for example, might be disproportionately impacted.

Recommendations:

- In the Final EIS, expand the demographic analysis to include children that would potentially be affected by the proposed project.
- Characterize/provide a baseline description of the existing health within the potentially affected communities and neighborhoods. For example, the following types of information would be relevant and useful: the asthma rate for children and adults, information about the rates of cardio-vascular disease, other respiratory impairments, and premature deaths.

Public involvement: There is not sufficient information in the Environmental Justice (EJ) Section of the Draft EIS to determine the extent and quality of the public involvement efforts. In our discussions with CRC Environmental Managers on June 10, 2008, we became aware of the depth and breadth of outreach and involvement efforts that were not described in the draft EIS. It was clear that an initial mailing of hundreds of post cards informing residents of possible displacements produced surprisingly few attendees at the subsequent public meeting on that subject. While later meetings reportedly saw improved participation, it is not yet clear whether affected individuals were adequately informed or involved. The fundamental question is whether or not the community members are satisfied with the level of participation, quality of information and the responsiveness of the CRC project proponents to their input. We would also like to know more about how the Community and Environmental Justice group evaluates the quality and effectiveness of its interactions and outreach efforts.

Recommendations:

- In the Final EIS, disclose more information about the participation levels and cross neighborhood representation at the various meetings, the concerns of the residents, what was learned in the process of trying to reach and involve diverse communities, and indicate how public input was incorporated into the project and decision making.

Cumulative impacts: Given the importance of cumulative impacts to EJ communities and other on-going and anticipated projects in the CRC project area or nearby, such as expansion of rail infrastructure, port expansions, and other road improvements and projects, a thorough analysis specifically dealing with EJ implications of cumulative impacts is warranted. The cumulative impacts discussion in the EIS for EJ (p. 3-427) mentions only tolling as a possible negative effect on the affected communities, and implies that because the construction of I-5 in the early 1960s divided neighborhoods and displaced residents that were composed of more minority and low income persons than in Portland and Vancouver as a whole, that the CRC related impacts are comparatively minor and can therefore be dismissed. We do not agree that past impacts of greater magnitude should negate the current and potential future impacts of the communities affected by the CRC project. The E.O. 12898 was issued specifically to address these injustices, with the intent to fully confront the impacts and give a voice to those similarly affected in the future.

Environmental Justice views traditional environmental concerns, such as water quality, open space, and wildlife as connected to social, cultural, and economic life. There should be information in the EJ section that attempts to portray a holistic picture of the impacts on diverse communities.

Recommendation: In the Final EIS, discuss the following issues and any other pertinent examples:

- How the project might impact subsistence fishing by local residents in the project area;
- Whether there is any information on the extent of this kind of activity given the Russian, Vietnamese and African-American populations, the poverty levels and the proximity of shoreline in the project area;
- Whether there are urban creeks in the neighborhoods (such as Burnt Bridge Creek);
- How communities value and use these resources; and
- How this information has been incorporated into our understanding of impacts.

Mitigation: For impacts that primarily affect the neighborhoods and communities adjacent to I-5 and within the project area, particularly the populations of low income, minority, elderly, and or disabled, the potential mitigation measures do not appear sufficient to offset project impacts that are largely born by the most disadvantaged populations in order that substantial public benefits may be derived. Thus, in addition to other mitigation recommendations included in our CRC Draft EIS comments, we suggest a number of ways in which mitigation might be strengthened:

To mitigate the impacts to disadvantaged neighborhoods in the project area, the DEIS discusses potential relocations, such as displaced homes, businesses, and facilities. However, there is no mitigation discussed for impacts associated with partial takings that do not result in full displacement, or for impacts such as encumbered home sales and business leases due to potential project impacts. A means to mitigate these impacts should be discussed and developed with those affected.

For noise impact mitigation, residential sound insulation is mentioned as an FTA-allowed measure, but not traditionally funded by FHWA. Only noise walls were deemed feasible and reasonable by FHWA and appear as the only likely mitigation to be offered. We recommend including the FTA residential sound insulation mitigation measures, and other measures that would be appropriate and feasible, including, but not limited to, the planting of vegetation.

The potential mitigation listed for CRC tolling impacts do little to alleviate these financial impacts. Reduced rate transponders are not very helpful for those who cannot afford to own a car. Considering the scope of current and additional impacts being borne by the affected neighborhoods, it would seem appropriate to offer the low income residents free fare transit passes, and reduced fare passes to other affected residents.

The Delta Park transportation project in Oregon provided the affected low-income and minority communities with community enhancement funding. The communities do not administer the funds, but they select the projects that would be of benefit to their respective

communities. This is a positive form of mitigation that could be provided in the affected Vancouver and Portland neighborhoods.

Disabled and elderly individuals could be especially impacted by project construction within their neighborhoods, and by increased traffic accessing Park & Ride facilities located in or near their communities. To mitigate safety hazards to disabled and elderly pedestrians, it would be helpful and appropriate to provide shuttle services to meet their transportation needs both during project construction and to access public transit once the project is operational.

Recommendation: Adopt these mitigation measures and/or others not listed here that are recommended by concerned individuals and organizations, to lessen the existing CRC project-related, and cumulative impacts on the affected communities.

Aquatic resources

Water quality and stormwater: The DEIS states (p. 3-384,385) that between 35 to 38 acres of untreated impervious surface would remain for each build alternative, and refers the reader to the CRC Conceptual Design Stormwater Report for a discussion of applied guidelines. It would be helpful to include an explanation as to why the remaining 35-38 acres would be untreated. It would also be helpful to know how stormwater would be treated and managed on the replacement or supplemental bridges.

The DEIS also states (p. 3-385) that Burnt Bridge Creek and the Columbia Slough could have increases in certain pollutants as a result of the CRC project compared to current conditions. The existing conceptual stormwater design would result in increased loads of dissolved copper in both of these 303(d) listed water bodies, and it is not stated whether or not other pollutant loadings would also be increased. On page 3-386, pollutant loadings are provided but effects on water quality and pollutant concentrations in water bodies are not quantified/estimated.

Construction impacts and stormwater pollutants would further degrade Burnt Bridge Creek, which flows into Vancouver Lake. Area residents, particularly people of low income, commonly fish in Vancouver Lake for subsistence. The DEIS does not disclose this or discuss the potential human health effects from this potential environmental consequence of the proposed project.

Recommendations:

- Provide a description of the stormwater treatment/management design in the Final EIS. Disclose the fate of stormwater from the remaining 35 to 38 acres of impervious surface, and describe how stormwater would be managed on the new proposed bridges.
- Disclose the environmental consequences of project specific and cumulative stormwater pollutants upon all project area water bodies, including Burnt Bridge Creek, Columbia Slough, and Vancouver Lake. Discuss the potential human health effects from swimming and fishing activities in Burnt Bridge Creek and Vancouver Lake from project specific and cumulative pollutants.

Wetlands and waters of the U.S: The DEIS, page 3-367, states that the Stacked Transit Highway Bridge (STHB) design would avoid more wetland acres of fill than the replacement design and would have 18% less structure in the Columbia River, although more smaller piers may be added to support this design (p. 3-372). The STHB design would also decrease the pollutant load in stormwater slightly more than the other bridge alternatives. It appears that the STHB design could potentially be considered to be the Least Environmentally Damaging Practicable Alternative (LEDPA), but the DEIS does not address this issue.

Recommendation: Consult with the Corps of Engineers and EPA to ensure that proposed actions will comply with legal requirements, including the Section 404(b)(1) guidelines, determination of the LEDPA, and to discuss conceptual mitigation plans. Include a discussion of these issues in the Final EIS.

The Draft EIS (p. 3-336) states that the Vanport wetlands connect to a wildlife corridor to the west that has few development interruptions. These wetlands are connected to other large remnants of the floodplain wetland system, which increases its value to wildlife needing larger habitat areas. Currently, large numbers of ducks, geese, swallows, and other migrating birds use this habitat.

Recommendation: Due to their high value wetland functions and connectivity, impacts to the Vanport wetlands and to their connections within the floodplain wetland system should be avoided.

Impacts to the Columbia River: The Draft EIS provides little information regarding the logistics and impacts involved with demolition and/or construction of new bridges and other project components on the Columbia River. Consequently, the impacts of construction and the need for mitigation are not sufficiently disclosed in the EIS.

Recommendation: In the Final EIS, disclose the nature, timing, and duration of any habitat modifications or impacts, such as dewatering, loss of riparian areas, bank hardening, debris and pollutant loadings, or other impacts, that would be necessary or likely as a result of project construction and demolition activities.

Noise and vibration – impacts on fish and aquatic wildlife: The DEIS, p. 3-314, indicates that noise from pile driving in deep water at 150 ft from the source can reach 190 dB, and that fish are killed or injured at 180 dB and above. While attenuation is quicker in shallow water, there is no explanation of how deep is deep, or how shallow is shallow. There is also no disclosure about the likely effects on the protected species and species of concern listed on p. 3-340 of the Draft EIS, which includes numerous fish species and two species of marine mammals, or on diving birds, from the project construction. Mitigation measures such as bubble curtains are mentioned, however, there is no explanation of the effectiveness of mitigation.

Recommendation:

- Include in the Final EIS information about the anticipated impacts on fish and wildlife in the project area, and beyond the project area, from noise and vibration during project construction, operation, and maintenance.

- Discuss potential mitigation measures and their effectiveness, and include mitigation commitments.

Impacts of Land Use Changes and Reduced Travel Times

The DEIS indicates that land use changes and growth are anticipated, both as a result of local planning and as a result of this project. Some growth will be concentrated near transit stations (transit-oriented development or TOD) and some growth may occur at the margins of urban growth boundaries as a result of reduced travel times. Neither the Land Use section nor the Cumulative Impacts Section discuss the potential impacts of growth on natural resources such as air and water quality.

Replacement Crossing Alternatives propose to double the number of highway lanes from six to twelve. EPA is concerned that roadway expansion of this magnitude, even with tolls and transit, may stimulate travel demand for use of privately owned vehicles (POVs), and may contribute to pressures for dispersed development.

In the Land Use Section (p. 3-135), the DEIS indicates that the analysis of potential induced growth was performed using a comprehensive literature review and comparative analysis of case studies. While this can be a helpful approach, we believe that additional analysis is merited for a project of this magnitude and importance for the region. We could agree in principle with the conclusions of the analysis that having a centralized urban core with good public transit, zoning, and transit oriented development would tend to foster maintenance of the urban centers and help to minimize dispersed development. However, the recent and current trends in land use and growth, particularly in the Vancouver area (see *The Columbian*, 5/16/08 article by Michael Andersen: "Growth board rules in favor of preserving farmland"), provide a stronger indication of the growth pressures and patterns that may be expected with the significant transportation improvements proposed by the CRC project, and in combination with other significant transportation improvements along I-5 and near the project area that are listed in the Draft EIS. We think more work is needed to evaluate the travel and land use change that would be stimulated by these individual and cumulative projects, and their associated impacts upon air, water, and land resources, as well as their socio-economic and human health effects.

Stimulated travel, dispersed development, and loss of natural resource lands may also be at odds with the Oregon and Washington Governors' goals for reducing greenhouse gas emissions. While tolls and transit would soften these effects, there is insufficient analysis and disclosure in the DEIS to compare the Supplemental (8 traffic lanes) and the Replacement (12 traffic lanes) Alternatives with respect to their potential to stimulate travel and growth and their associated impacts to air, water, and land resources, including climate change. It seems logical to expect that some degree of congestion, such as may result from the more moderate I-5 expansion proposed in the Supplemental Alternatives, would likely encourage greater use of alternative travel modes (which is anticipated in the Supplemental Alternatives as proposed), and affect discretionary travel decisions.

Recommendations:

- In the Final EIS, include a discussion of potential impacts of growth on air and water quality.
- Consult the FHWA web page for additional methodologies to evaluate the indirect effects of stimulated travel and growth. Results should reveal changes in travel behavior and the likely destinations/locations of eventual land use change.
- Seriously consider selecting a preferred alternative that places less emphasis on the expansion of I-5 and more emphasis on the provision and use of public transit, bicycle and pedestrian modes, and on TDM and TSM strategies.

Ecological connectivity, wildlife

We fully agree with the statement on page 3-336 of the DEIS that I-5 is an important barrier to wildlife passage for land-based species, and that the existing underpasses and stream crossings on I-5 provide for some connectivity, but they are not well-suited to or designed for wildlife movement. Substantially widened highway and bridge facilities with higher traffic volumes and speeds would present additional safety hazards for motorists and wildlife, and would exacerbate and the impassable nature of I-5. To improve human and wildlife safety and prevent wildlife-vehicular collisions, maintain biodiversity, and provide corridors that contribute to regional adaptation to climate change, we believe that all possible opportunities be taken to improve the permeability of I-5. For the same reasons, it is important to take this opportunity, as suggested on page 3-353 of the DEIS, to re-establish or improve riparian features along the Columbia River and its associated water bodies wherever feasible as a form of mitigation for past and current project-related environmental impacts.

Ecological connectivity is a broader concept than wildlife movement in the landscape. It includes the connections and interactions between land and water, the transfer of water, wood, soil, nutrients, genes, species, and related processes. For example, ecological connectivity is impaired when a stream is channelized and separated from its flood plain; when shoreline structures or bank armoring block sediment flows and shoreline enrichment processes; when dams are built or culvert installation block fish passage; when wetland fills or impervious surface prevent ground water aquifer recharge; when hillslope cuts breach seepage areas, springs, or underground aquifers; and when aquatic habitat hydrological alterations and development interfere with surface water/ground water interactions and riverine hyporheic zones. Environmental impact assessments need to focus much more on identifying these connections and the consequences of severing them; project design should incorporate the means to preserve and restore them.

As discussed in the DEIS, bridges also provide habitat for wildlife, such as the swallows and peregrine falcons that inhabit the existing bridges. Replacement or supplemental bridge design could and should also incorporate features that would provide needed wildlife habitat.

Recommendations:

- Consult with ODFW and WDFW, USFWS, and NOAA Fisheries, tribes, and interested/concerned non-governmental organizations regarding the opportunities, needs, locations, number, and design of wildlife crossing features and improved hydrological and fish passage structures that could be incorporated into the design of the CRC project.
- Consult with these same entities and other relevant landowners regarding the potential for riparian area re-establishment and improvement along the Columbia River and its associated water bodies as a form of environmental mitigation for project-related impacts.
- Consult with the above agencies and relevant interest groups, such as Bats International, Audubon Society, and other wildlife organizations regarding bridge and highway design features that would provide wildlife habitat. Include discussions regarding management of roadside vegetation to either attract or detract wildlife from the roadways and guideways as appropriate.

Financial analysis

The EIS provides helpful discussion of economic and financial related issues. There remain a few items that we believe would contribute to a better understanding of the project's impacts and feasibility:

Ensuring fair distribution of benefits and adverse effects: Mitigation for tolls is discussed in the EIS (p. 3-179), however that mitigation should be strengthened to provide meaningful mitigation for adverse financial effects to low income residents (see comments on Environmental Justice above). The impact from potential sales and property taxes to the affected populations in general, and particularly to those segments of the population that would fall within the Environmental Justice discussion, have not been addressed.

Recommendation: Include a discussion of potential sales and property taxes that may be imposed to finance components of the CRC project. Disclose what these taxes would be used for, and what the potential economic impacts would be, particularly for low income communities and residents. Express the economic impacts in relevant terms, such as, per capita costs per year.

Finance plan: In Section 4.2.1 the EIS states that "A finance plan will be developed during the FEIS stage and will incorporate both the FHWA and FTA methodologies." An issue relevant to the inclusion of a finance plan is a project's financial feasibility, as mentioned in the DEIS's Project Abstract (p. iii). We note that this approach does not allow reviewers and the public the opportunity to compare alternatives' financial feasibility at the DEIS stage in order to inform the choice of alternatives.

We believe that sufficient information should currently be available, with the necessary caveats and assumptions, that can form the basis for a Draft EIS stage Financial Plan appendix, for the purpose of addressing project financial feasibility issues. The project's four action alternatives lend themselves to facilitating the inclusion of a preliminary financial feasibility analysis in that there is little substantial variability among them. The analysis could also use sensitivity analysis to address issues where variability would have to be considered

Recommendation: Include sufficient and necessary financial information, if possible, in a document for public review prior to issuing the FEIS. This could be accomplished by using the approach and formats suggested in FTA's *Guidance for Transit Financial Plans*. The *Guidance* is based on currently available information.

Business mitigation measures: Loss of revenue to a displaced business is an adverse effect resulting from the project, particularly within the low income and minority communities. These impacts should be evaluated and steps should be taken to mitigate these impacts.

Recommendation: Include in Section 3.4.5 a discussion of loss of revenue to businesses and what mitigation could be anticipated as part of the relocation assistance program.

Hazardous Materials: The DEIS (p. 3-406) indicates that 427 potential hazardous materials sites were identified within 500 ft of the project area. Of these, 31 sites ranked as potentially high risk. The Marine Drive south alignment is located adjacent to the Harbor Oil Superfund site on North Force Avenue where petroleum, PCBs, pesticides, and other hazardous materials are located. In the Draft EIS, it is unclear whether the identification, site assessment, liability investigations, and clean up of hazardous materials sites have been factored into construction schedules and cost analyses. Detailed investigations have not occurred, but are needed to estimate environmental hazards, human health risks, cost and time needed for clean up and subsequent project construction.

Recommendation: Disclose whether the project construction schedule and cost estimates have factored in the site assessment, liability investigations, and clean up of the hazardous materials sites that would be encountered during project construction. If not, provide an estimate of time and costs associated with the cleanup of these sites and include these in the project financial analysis.

Tribal consultation

We commend the CRC project for their efforts to consult with Native American tribes, and for being responsive to their request to avoid upriver bridge placement to avoid potential burial grounds. We also commend the project proponents for their discussions with tribes regarding plants and animals of cultural significance as traditional food, craft, and medicinal sources. The DEIS, however, does not indicate whether anything would be done to protect or enhance these resources.

Recommendation: Clarify in the Final EIS how the information provided by the tribes regarding traditional food, craft, and medicinal sources will be used in project planning and implementation.

EIS Document Design

Unusual features of the CRC DEIS are that it provides only a rudimentary Table of Contents, but at the beginning of chapters, provides a listing of chapter subjects and sections.

We think that a more traditional approach of providing a complete Table of Contents would facilitate the review of this large EIS. The reader is also frequently referred to the Technical Reports on each subject for more information, as the analytical information in the DEIS often seems minimal to cursory. It is customary to include all important information, including a description of assessment methodologies, in the main document, the EIS, and reserve unnecessary details for the appendices for those who simply desire more detailed information. By relying heavily on the readers' use of the Technical Reports for each subject, the EIS may not sufficiently inform the reader as a stand-alone document, and through its reliance on the Technical Reports may become "encyclopedic" in nature.

Recommendations:

- Include a complete Table of Contents in the Final EIS.
- Incorporate more information from the Technical Reports to sufficiently inform the public and decision maker about the assessment and analytical methodologies and results in order to sufficiently support conclusions made in the EIS.

APPENDIX B

Environmental Data Resources Area Study
Database Search Results CD/ROM