

Appendix B.
Excerpts from Project-Related WSDOT
Reports

Kingdome Area Intermodal Access Project

Final Hazardous Waste Report

November 1996



**Environmental
Affairs Office**

Washington State Department of Transportation
Environmental Affairs Office



Washington State Department of Transportation

Environmental Listings

Research to identify land uses of concern for hazardous waste included reviewing available regulatory records on properties in or adjacent to the three study areas. Information in U.S. Government records was acquired by visiting Region 10 of the Environmental Protection Agency (EPA), through the EPA Internet home page, and through a Freedom of Information request. Washington State Department of Ecology (Ecology) published listings were also reviewed.

The objective of this review was to identify and document known releases of hazardous materials into the environment and to identify those businesses and industries that generate, store, or transport regulated hazardous materials. Information obtained in this review was entered into the electronic data base prepared for this discipline study.

See Table 1-2 for a listing of sites on the various lists discussed below, and Figure 1-2 for a map showing their locations.

Environmental Protection Agency

EPA records contain extensive information on Superfund investigations and prioritized sites, generators and transporters of hazardous materials, and public legal proceedings. The following lists were reviewed for the discipline study.

- The National Priority List (NPL), October 2, 1995, is a listing of sites with highest priority (Superfund) for cleanup pursuant to EPA's Hazard Ranking System. There are no properties in or adjacent to the study areas on this list.
- The EPA Superfund Program Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Information System (CERCLIS) contains information on potentially contaminated sites that EPA has investigated for possible inclusion on the NPL. However, listed sites are not necessarily Superfund Sites. Sites still under investigation, or sites for which EPA has determined no further action is required at the federal level, are not Superfund Sites. There are six sites in the study areas on the September 21, 1994 CERCLA list. There were no sites near the study areas on the May 9, 1996 CERCLA list.
- The EPA Resource, Conservation and Recovery Act Information System (RCRIS) contains a listing of businesses on the RCRA Notifiers List. The RCRA Notifiers List documents businesses that generate, store, transport, or dispose of potentially hazardous or toxic materials as part of their normal operations. Being identified on the RCRA list does not imply the site is contaminated, only that the business in some manner handles materials regulated under RCRA. Based on a review of the April 12, 1996 listing, there are 77 sites on the RCRA Notifiers List.

Washington State Department of Ecology (Ecology)

Ecology periodically publishes several environmental listings that contain information on sites affected by the Model Toxics Control Act (MTCA). Ecology also provides information on legal actions, and on reviews and actions on cleanup projects. The following lists were reviewed for the discipline study.

- The Confirmed or Suspected Contaminated Sites (CSCS) list contains information on sites that are regulated under Washington State law. The listing identifies which media is or is suspected of being contaminated, what category of contaminant is present, and whether a particular media has been remediated. These sites are often the same as those on the EPA CERCLIS when Ecology has conducted an investigation, state funding is used for cleanup, or reporting is required under MTCA. There are nine sites reported on the November 13, 1995 CSCS.
- Ecology Underground Storage Tank (UST) list and Leaking Underground Storage Tank (LUST) list identify all underground storage tanks and leaking underground storage tanks by county. The lists do not indicate the extent or severity of the possible contamination. The Ecology UST list contains all regulated and registered USTs in Washington. There are exceptions for certain types or sizes of UST; therefore, the list does not identify all USTs that may contaminate property. Altogether, there are 51 properties on these two Ecology lists. Sites on the UST list are not necessarily contaminated, but there is the potential for release and resulting contamination. Some sites on the LUST list may have been cleaned up and no longer present a threat to the environment.
- The Toxics Cleanup Program Site Register is a periodic publication that alerts the public to the availability of reports, public comment periods, and other activities related to the study and cleanup of hazardous waste sites under MTCA. This register often provides a brief summary of activities being conducted at a particular site. Registers for 1995 and 1996 were reviewed.

**Table 1-2
Environmental Listings**

Environmental List*	Study Area	Map #	Name	Address
CSCS, UST	Area A	003	Seattle Steam	700 Post Avenue
LUST, RCRA, UST	Area A	007	Port of Seattle Terminal 46	401 Alaskan Way S.
LUST, UST	Area A	015	Turner & Pease	815 Western Avenue
LUST, RCRA, UST	Area A	019	Terminal 37	1201 Alaskan Way S.
RCRA, UST	Area A	030	USDOT/USGSA	1555 Alaskan Way S.
LUST, UST	Area A	036	Union Pacific Railroad	801 First Avenue S.
LUST	Area A	037	Commuter Center Parking	801 Western Avenue
RCRA	Area A	081	Tashiro Kaplan	306 S. Washington
RCRA	Area A	085	Brix Maritime	353 Alaskan Way S.
RCRA	Area A	086	Washington State Ferries	Pier 52
RCRA	Area A	087	Port of Seattle	101 Alaskan Way S.
CERCLA, RCRA, UST	Area A	091	U. S. Coast Guard Support Center	1519 Alaskan Way S.

*CERCLA Comprehensive Environmental Response, Compensation and Liability Act
 CSCS Ecology Confirmed and Suspected Contaminated Sites Report
 LUST Ecology Leaking Underground Storage Tank list
 UST Ecology Underground Storage Tank list
 RCRA EPA Resource, Conservation and Recovery Act Notifiers list

Environmental List*	Study Area	Map #	Name	Address
RCRA	Area A	093	U. S. Department of Justice	1500 Alaskan Way S.
RCRA	Area A	101	Olympic Reprographics	1016 First Avenue S.
CERCLA, RCRA	Area A	115	Metro Control	401 S. Jackson
RCRA	Area A	123	CatxTank	1733 Alaskan Way S.
RCRA	Area A	124	Cal Ink	1727 Alaskan Way S.
CERCLA, RCRA	Area A	129	Maritime Building	911 Western
CERCLA, RCRA	Area A	130	Maritime DSPL	Pier 35
UST	Area A	209	City Fire Department	301 Second Avenue S.
UST	Area A	259	Seafood Enterprises, Inc.	Pier 54
CSCS, RCRA	Area B	001	Union Station	400-409 Jackson Street
CSCS	Area B	004	Metro Bus Barn/Union Station	1398 E. Jefferson Street
LUST, RCRA, UST	Area B	027	Kingdome	201 S. King
LUST	Area B	031	King County Garage	500 Fourth Avenue S.
LUST	Area B	033	Rex Hotel	657 S. King Street
LUST, RCRA, UST	Area B	035	Seattle Parking Garage	74 S. Jackson Street
LUST	Area B	041	Pacific Fish Company	814 Sixth Avenue S.
UST	Area B	056	Seattle Gas & Light Works/ Cascade Oil	Jackson & Fifth
UST, RCRA	Area B	068	General Motors Corp./Truck Center Corp.	620 Fifth Avenue
RCRA	Area B	080	City of Seattle Engineer	600 Fourth Avenue S.
RCRA	Area B	128	Squire Boats	830 Fourth Avenue S.
UST	Area B	161	Union Oil Gas Station/ Unknown service station #5475	320 Fifth Avenue S.
CSCS	Area C	002	City of Seattle Fire Garage	815 S. Dearborn
CERCLA, CSCS, RCRA, UST	Area C	005	Northwest Environmental Services	1500 Airport Way S.
CSCS	Area C	006	Metro Seattle Transit	1333 Airport Way S.
RCRA	Area C	008	Bemis Co., Inc.	55 S. Atlantic
LUST, RCRA	Area C	009	City of Seattle	705 S. Charles
LUST, RCRA, UST	Area C	010	Shell Station 64819	511 S. Dearborn
LUST, RCRA, UST	Area C	011	Salvation Army	1000 Fourth Avenue S.
RCRA	Area C	012	Acme Cartage Garage	1714 First Avenue S.

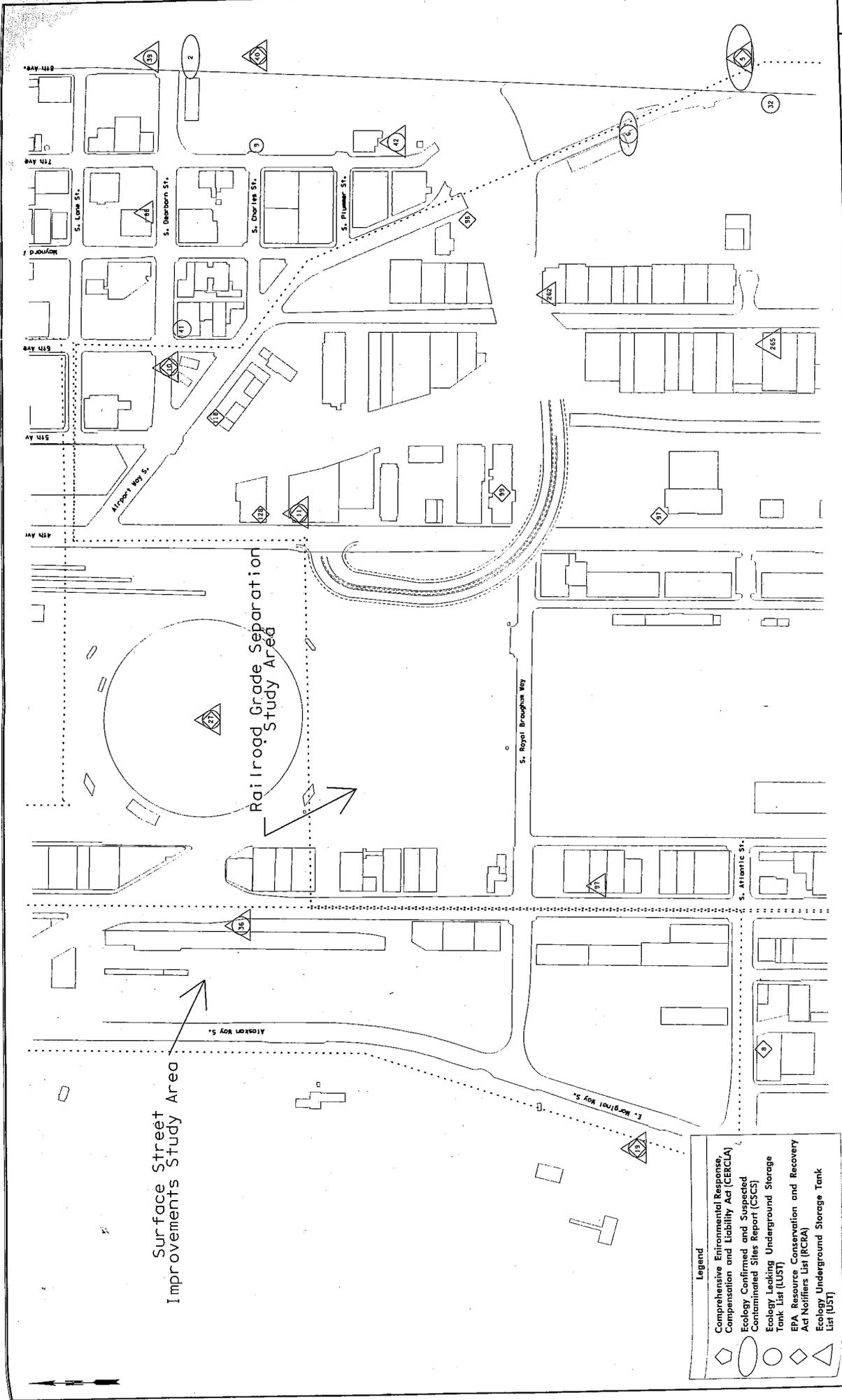
*CERCLA Comprehensive Environmental Response, Compensation and Liability Act
CSCS Ecology Confirmed and Suspected Contaminated Sites Report
LUST Ecology Leaking Underground Storage Tank list
UST Ecology Underground Storage Tank list
RCRA EPA Resource, Conservation and Recovery Act Notifiers list

Environmental List*	Study Area	Map #	Name	Address
RCRA	Area C	013	Gans Ink	1701 Fourth Avenue S.
RCRA	Area C	014	Western Pacific	1600 Airport Way S.
CSCS, LUST	Area C	016	Mobile Truck/Alaska Traffic Consultants	2214 Fourth Avenue S.
CSCS, RCRA	Area C	017	Pacific Iron & Metals	2230 Fourth Avenue S.
CERCLA, CSCS, RCRA, LUST	Area C	018	Pacific Chem. & Cleaning Co.	2200 Fourth Avenue S.
LUST, RCRA, UST	Area C	020	Music - Vend Distributing Co.	1550 Fourth Avenue S.
LUST, RCRA, UST	Area C	021	Metro Atlantic Operating Base	1555 Airport Way S.
LUST, RCRA	Area C	022	U. S. West	1709 Airport Way S.
LUST, RCRA, UST	Area C	023	VECA Electric	1762 Airport Way S.
LUST	Area C	024	Jack in the Box	1907 Fourth Avenue S.
LUST, UST	Area C	025	Taylor Edwards	1930 Sixth Avenue S.
LUST, UST	Area C	026	Budget Rent-A-Car	1961 Fourth Avenue S.
RCRA	Area C	028	Fisher Bag	1560 First Avenue S.
LUST, RCRA	Area C	029	Fajole Brothers	2201 Fourth Avenue S.
LUST	Area C	032	Freeway Garage	1512 Eighth Avenue S.
RCRA	Area C	034	Guardian Security System	1743 First Avenue S.
LUST	Area C	038	Food Service International	801 S. Holgate
LUST, RCRA, UST	Area C	039	Metro Base	802 S. Dearborn Street
LUST, RCRA, UST	Area C	040	Seattle Admin. Service	805 S. Charles Street
LUST, UST	Area C	042	Charles Street Fueling	1030 Seventh Avenue S.
UST	Area C	046	Kohl & Kohl Gas Station	301 Connecticut
RCRA	Area C	055	Washington Iron Works	1500 Sixth Avenue S.
RCRA	Area C	067	Seattle Eng. Dept.	707 S. Plummer
RCRA	Area C	082	Heart Wood/Immuno- diagnostics, Inc.	562 First Avenue S.
RCRA	Area C	083	N. F. Corp.	526 First Avenue S.
RCRA	Area C	084	U. of W. Pioneer site	206 Third Avenue S.
RCRA, UST	Area C	088	Spic & Span Cleaners	652 S. Dearborn
RCRA	Area C	089	Truck Service, Inc.	637 S. Massachusetts
RCRA	Area C	090	Mack Trucks	2025 Airport Way S.
RCRA	Area C	092	Frye Art	1507 Sixth Avenue S.
RCRA	Area C	094	Seattle Injector	1410 Airport Way S.
RCRA	Area C	095	Lowe Parker Group	1234 Sixth Avenue S.

*CERCLA Comprehensive Environmental Response, Compensation and Liability Act
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UST Ecology Underground Storage Tank list
RCRA EPA Resource, Conservation and Recovery Act Notifiers list

Environmental List*	Study Area	Map #	Name	Address
RCRA	Area C	096	Saybort, Inc.	1225 Fourth Avenue S.
RCRA, UST	Area C	097	Metro Ryerson	1220 Fourth Avenue
RCRA, UST	Area C	098	Romaine Electric	1101 Airport Way S.
RCRA	Area C	099	Romac, Inc.	1064 Fourth Avenue S.
RCRA	Area C	100	Allied Battery	1031 Sixth Avenue S.
RCRA	Area C	102	Seattle Eng.	1010 Eighth Avenue S.
RCRA	Area C	103	Dames & Moore/ Katy Film/ Burlington Envr. Lab/Stacy St. Soc.	2203 Airport Way S.
RCRA	Area C	104	Hallidie Machinery	2200 Sixth Avenue S.
RCRA	Area C	105	Motor Parts Machine	2100 Airport Way S.
RCRA	Area C	106	Cark Insulation	1943 First Avenue S.
RCRA	Area C	107	Sea Radiator	1936 First Avenue S.
RCRA	Area C	108	Lundwick Floor	1921 First Avenue S
RCRA, UST	Area C	109	Star Rental	1919 Fourth Avenue S.
RCRA	Area C	110	Classic Impression	1906 Occidental
RCRA	Area C	111	Port of Seattle, Pier 34	19 S. Massachusetts
RCRA, UST	Area C	112	Maust Transfer	1762 Sixth Avenue S.
RCRA	Area C	113	Atkinson Dillingham	500 Royal Brougham Way
RCRA	Area C	114	International Leasing	465 S. Holgate
RCRA	Area C	116	Popich Sign Co.	831 Airport Way
RCRA	Area C	117	Sea Bay Transportation	9 S. Massachusetts
RCRA	Area C	118	USGSA	815 Airport Way
RCRA	Area C	119	Binks	1749 First Avenue S.
RCRA, UST	Area C	120	Amtrak	1739 Third Avenue S.
RCRA	Area C	121	S. K. Beechman	1737 Airport Way S.
RCRA	Area C	122	Burlington Northern Railroad	1735 Third Street
RCRA	Area C	125	Paramount Supply	1717 Sixth Avenue S.
RCRA	Area C	126	Container Care	51 S. Massachusetts
RCRA	Area C	127	Millwork Supply	2225 First Avenue S.
UST	Area C	258	Avis Rent a Car System, Inc.	1919 Fifth Avenue
UST	Area C	261	7th Avenue Service	701 S. Jackson St.
UST	Area C	262	E. J. Bartells	1212 Sixth Avenue S.
UST	Area C	263	R. H. Brown Co.	1900 Fourth Avenue S.
UST	Area C	264	Oberto Sausage Company	2005 Airport Way S.
UST	Area C	265	Princeton Packaging, Inc.	1505 Sixth Avenue S.
UST	Area C	266	Sid Eland, Inc.	1565 Sixth Avenue S.

*CERCLA Comprehensive Environmental Response, Compensation and Liability Act
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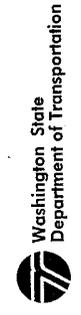


Surface Street Improvements Study Area

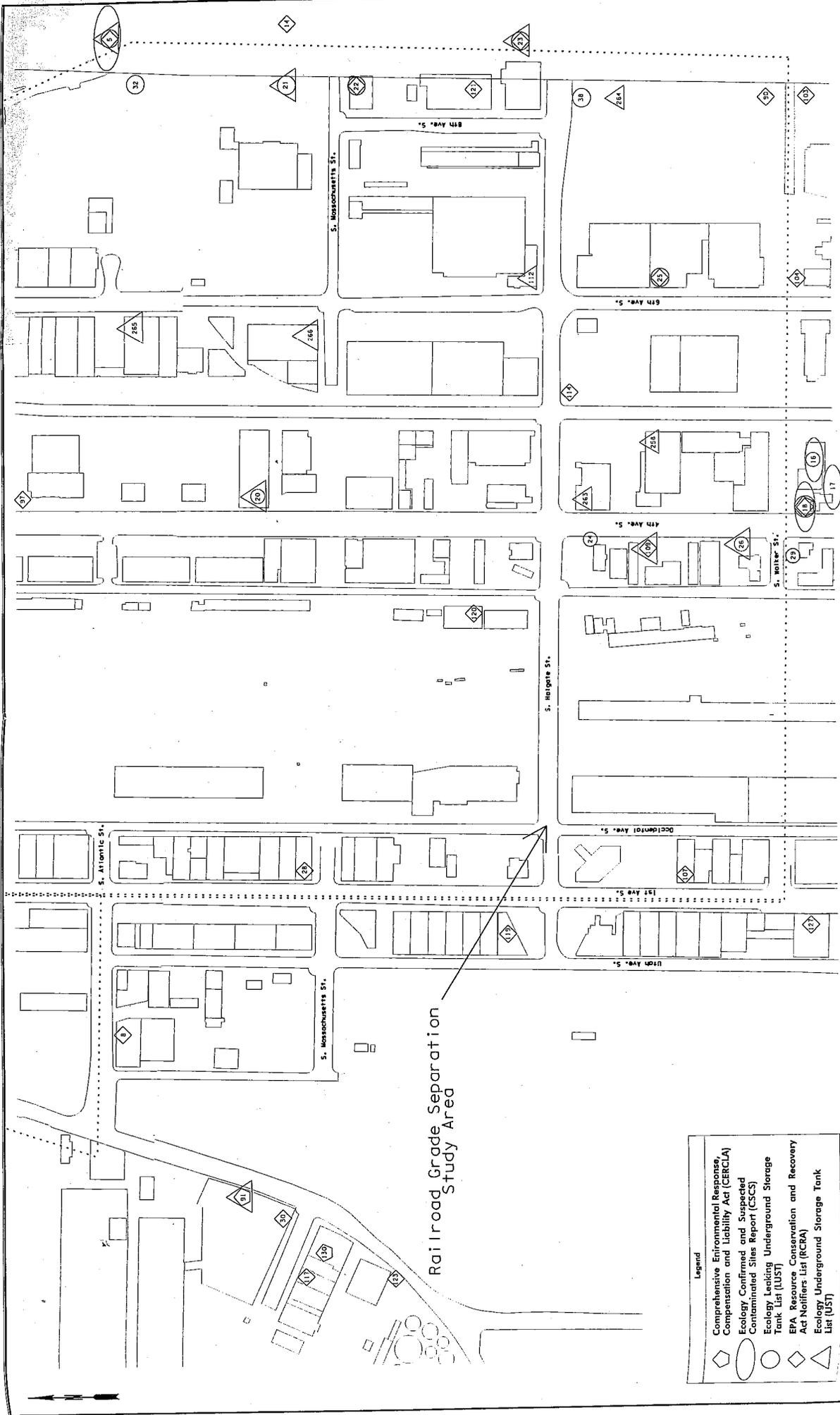
Railroad Grade Separation Study Area

- Legend**
- ◊ Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)
 - Ecology Confirmed and Suspected Contaminated Sites Report (ECCSR)
 - Ecology Leaking Underground Storage Tank List (ELUST)
 - ◊ EPA Resource Conservation and Recovery Act Notifiers List (RCRA)
 - △ Ecology Underground Storage Tank List (EUST)

OL 2686 – Kingdome Area Intermodal Access Project

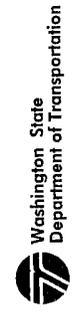


Properties On Environmental Lists



- Legend
- ◇ Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)
 - △ Ecology Confirmed and Suspected Contaminated Sites Report (CSMRS)
 - Ecology Leaking Underground Storage Tank List (UST)
 - ◇ EPA Resource Conservation and Recovery Act Nonifiers List (RCRA)
 - Ecology Underground Storage Tank List (UST)

OL 2686 - Kingdome Area Intermodal Access Project



Properties On Environmental Lists

Fig. 1-2C

SR 519
Intermodal Access Project

Right of Way Preliminary Site Investigation
Sampling Analysis Plan

August 1997

Prepared by the WSDOT Environmental Affairs Office



Washington State
Department of Transportation

ATTACHMENT B

**SUMMARY DATA TABLES AND DATA VALIDATION
MEMORANDUM**

Table 1
Sample Analysis Summary
WSDOT SR 519 Preliminary Site Investigation
Seattle, Washington

Sample Location	Sample Number	Matrix	Date Sampled	Analysis
SB-01	SB-1-5	Soil	9/29/97	TPH-G/BTEX, TPH-D, TPH-O, metals
SB-01	SB-1-20	Soil	9/29/97	TPH-G/BTEX, TPH-D, TPH-O, metals
SB-03	SB-3-5	Soil	9/29/97	TPH-G/BTEX, TPH-D, TPH-O, metals
SB-03	SB-3-25 ^a	Soil	9/29/97	TPH-G/BTEX, TPH-D, TPH-O, metals
SB-03	SB-68-30 ^a	Soil	9/29/97	TPH-G/BTEX, TPH-D, TPH-O, metals
SB-05	MW-5-0997	Water	9/29/97	TPH-G/BTEX, TPH-D, TPH-O, metals, VOCs
SB-05	SB-5-5	Soil	9/29/97	TPH-G/BTEX, TPH-D, TPH-O, metals
SB-05	SB-5-25	Soil	9/29/97	TPH-G/BTEX, TPH-D, TPH-O, metals
SB-06	SB-6-5	Soil	9/29/97	TPH-G/BTEX, TPH-D, TPH-O, metals
SB-06	SB-6-30 ^a	Soil	9/29/97	TPH-G/BTEX, TPH-D, TPH-O, metals
SB-06	SB-67-30 ^a	Soil	9/29/97	TPH-G/BTEX, TPH-D, TPH-O, metals
SB-07	SB-7-5	Soil	10/6/97	TPH-G/BTEX, TPH-D, TPH-O, metals
SB-07	SB-7-25	Soil	10/6/97	TPH-G/BTEX, TPH-D, TPH-O, metals
SB-08	SS-8-5	Soil	9/8/97	TPH-G/BTEX, TPH-D, TPH-O, metals
SB-08	SS-8-20	Soil	9/8/97	TPH-G/BTEX, TPH-D, TPH-O, metals, VOCs
SB-09	SS-9-10	Soil	8/28/97	TPH-G/BTEX, TPH-D, TPH-O, metals
SB-09	SS-9-20	Soil	9/3/97	TPH-G/BTEX, TPH-D, TPH-O, metals, VOCs
SB-10	SS-10-5	Soil	9/3/97	TPH-G/BTEX, TPH-D, TPH-O, metals
SB-10	SS-10-25	Soil	9/3/97	TPH-G/BTEX, TPH-D, TPH-O, metals, VOCs
SB-11	SS-11-5	Soil	9/3/97	TPH-G/BTEX, TPH-D, TPH-O, metals
SB-11	SS-11-25	Soil	9/3/97	TPH-G/BTEX, TPH-D, TPH-O, metals, VOCs
SB-12	SS-12-5	Soil	9/9/97	TPH-G/BTEX, TPH-D, TPH-O, metals, VOCs
SB-12	SS-12-17	Soil	9/9/97	TPH-G/BTEX, TPH-D, TPH-O, metals, VOCs
SB-13	SB-13-10	Soil	9/17/97	TPH-G/BTEX, TPH-D, TPH-O, metals
SB-13	SB-13-20	Soil	9/17/97	TPH-G/BTEX, TPH-D, TPH-O, metals
SB-14	SB-14-5	Soil	9/16/97	TPH-G/BTEX, TPH-D, TPH-O, metals, VOCs
SB-14	SB-14-25	Soil	9/16/97	TPH-G/BTEX, TPH-D, TPH-O, PAHs, metals, VOCs
SB-15	SB-15-5	Soil	9/19/97	TPH-G/BTEX, TPH-D, TPH-O, metals
SB-15	SB-15-25	Soil	9/19/97	TPH-G/BTEX, TPH-D, TPH-O, metals
SB-16	SB-16-5	Soil	9/23/97	TPH-G/BTEX, TPH-D, TPH-O, metals

Table 1
Sample Analysis Summary
WSDOT SR 519 Preliminary Site Investigation
Seattle, Washington

Sample Location	Sample Number	Matrix	Date Sampled	Analysis
SB-16	SB-16-25	Soil	9/23/97	TPH-G/BTEX, TPH-D, TPH-O, metals
SB-17	SB-17-15 ^a	Soil	9/23/97	TPH-G/BTEX, TPH-D, TPH-O, metals
SB-17	SB-45-15 ^a	Soil	9/23/97	TPH-G/BTEX, TPH-D, TPH-O, metals
SB-17	SB-17-20	Soil	9/23/97	TPH-G/BTEX, TPH-D, TPH-O, PAHs, metals, VOCs, PCBs
SB-18 (well)	MW-18-1097	Water	10/22/97	TPH-G/BTEX, TPH-D, TPH-O, metals, VOCs, PAHs
SB-18	SS-18-15	Soil	8/25/97	TPH-G/BTEX, TPH-D, TPH-O, PAHs, metals, VOCs, PCBs
SB-18	SS-18-20	Soil	8/25/97	TPH-G/BTEX, TPH-D, TPH-O, metals
SB-18 (well)	SS-18-25	Soil	8/28/97	TPH-G/BTEX, TPH-D, TPH-O, metals
SB-19	SB-19-5	Soil	10/9/97	TPH-G/BTEX, TPH-D, TPH-O, metals
SB-19	SB-19-20	Soil	10/9/97	TPH-G/BTEX, TPH-D, TPH-O, metals
SB-20	SB-20-5	Soil	10/8/97	TPH-G/BTEX, TPH-D, TPH-O, metals
SB-20	SB-20-20	Soil	10/8/97	TPH-G/BTEX, TPH-D, TPH-O, metals
SB-21	SB-21-5	Soil	10/8/97	TPH-G/BTEX, TPH-D, TPH-O, metals
SB-21	SB-21-25	Soil	10/8/97	TPH-G/BTEX, TPH-D, TPH-O, metals
SB-22	SB-22-5	Soil	9/25/97	TPH-G/BTEX, TPH-D, TPH-O, metals
SB-22	SB-22-25	Soil	9/25/97	TPH-G/BTEX, TPH-D, TPH-O, metals
SB-23	SB-23-5	Soil	9/11/97	TPH-G/BTEX, TPH-D, TPH-O, metals
SB-23	SB-23-25	Soil	9/11/97	TPH-G/BTEX, TPH-D, TPH-O, metals
SB-24 (well)	MW-24-109	Water	10/3/97	TPH-G/BTEX, TPH-D, TPH-O, metals
SB-24	SB-24-5	Soil	9/12/97	TPH-G/BTEX, TPH-D, TPH-O, metals
SB-24	SB-24-25	Soil	9/12/97	TPH-G/BTEX, TPH-D, TPH-O, metals
SB-25	SB-25-5	Soil	10/3/97	TPH-G/BTEX, TPH-D, TPH-O, metals
SB-25	SB-25-25	Soil	10/3/97	TPH-G/BTEX, TPH-D, TPH-O, metals
SB-26	SB-26-5	Soil	10/3/97	TPH-G/BTEX, TPH-D, TPH-O, metals
SB-26	SB-26-25	Soil	10/3/97	TPH-G/BTEX, TPH-D, TPH-O, metals
SB-27	SB-27-5	Soil	10/13/97	TPH-G/BTEX, TPH-D, TPH-O, metals
SB-27	SB-27-25	Soil	10/13/97	TPH-G/BTEX, TPH-D, TPH-O, metals
SB-28	SB-28-5	Soil	10/3/97	TPH-G/BTEX, TPH-D, TPH-O, PAHs, metals, VOCs
SB-28	SB-28-20	Soil	10/3/97	TPH-G/BTEX, TPH-D, TPH-O, PAHs, metals, VOCs
SB-29	SB-29-5	Soil	9/29/97	TPH-G/BTEX, TPH-D, TPH-O, metals
SB-29	SB-29-25	Soil	9/29/97	TPH-G/BTEX, TPH-D, TPH-O, metals

Table 1
Sample Analysis Summary
WSDOT SR 519 Preliminary Site Investigation
Seattle, Washington

Sample Location	Sample Number	Matrix	Date Sampled	Analysis
SB-30	SB-30-5	Soil	10/3/97	TPH-G/BTEX, TPH-D, TPH-O, metals
SB-30	SB-30-25	Soil	10/3/97	TPH-G/BTEX, TPH-D, TPH-O, metals
SB-31	SB-31-5	Soil	10/3/97	TPH-G/BTEX, TPH-D, TPH-O, metals
SB-31	SB-31-25	Soil	10/3/97	TPH-G/BTEX, TPH-D, TPH-O, metals
SB-32	SB-32-5	Soil	10/3/97	TPH-G/BTEX, TPH-D, TPH-O, metals
SB-32	SB-32-25	Soil	10/3/97	TPH-G/BTEX, TPH-D, TPH-O, metals
SB-33	SB-33-5	Soil	9/24/97	TPH-G/BTEX, TPH-D, TPH-O, metals
SB-33	SB-33-25D ^a	Soil	9/24/97	TPH-G/BTEX, TPH-D, TPH-O, metals
SB-33	SB-33-25 ^a	Soil	9/24/97	TPH-G/BTEX, TPH-D, TPH-O, metals
SB-34	SS-34-0997	Water	9/5/97	TPH-G/BTEX, TPH-D, TPH-O, metals, VOCs
SB-34	SS-34-5	Soil	9/5/97	TPH-G/BTEX, TPH-D, TPH-O, metals, PAHs
SB-34	SS-34-15	Soil	9/5/97	TPH-G/BTEX, TPH-D, TPH-O, metals, VOCs
SB-35 (well)	MW-35-109	Water	10/6/97	TPH-G/BTEX, TPH-D, TPH-O, metals
SB-35	SS-35-5	Soil	9/5/97	TPH-G/BTEX, TPH-D, TPH-O, metals
SB-35	SS-35-20	Soil	9/5/97	TPH-G/BTEX, TPH-D, TPH-O, metals, PAHs, VOCs
SB-36	SB-36-5	Soil	10/8/97	TPH-G/BTEX, TPH-D, TPH-O, metals
SB-36	SB-36-20	Soil	10/8/97	TPH-G/BTEX, TPH-D, TPH-O, metals
SB-38	SB-38-5	Soil	10/13/97	TPH-G/BTEX, TPH-D, TPH-O, metals
SB-38	SB-38-25	Soil	10/13/97	TPH-G/BTEX, TPH-D, TPH-O, metals
SB-39	SB-39-25	Soil	10/3/97	TPH-G/BTEX, TPH-D, TPH-O, metals
SB-39	SB-39-10	Soil	10/3/97	TPH-G/BTEX, TPH-D, TPH-O, metals
SB-40 (well)	MW-40-1097	Water	10/22/97	TPH-G/BTEX, TPH-D, TPH-O, metals
SB-40	SB-40-5	Soil	10/3/97	TPH-G/BTEX, TPH-D, TPH-O, metals
SB-40	SB-40-30	Soil	10/3/97	TPH-G/BTEX, TPH-D, TPH-O, metals

Notes: TPH-G = total petroleum hydrocarbons as gasoline (Ecology Method WTPH-G);
TPH-D, TPH-O = total petroleum hydrocarbons as diesel and motor oil (Ecology Method WTPH-D [extended]);
BTEX = benzene, toluene, ethylbenzene, and xylenes by USEPA Method 8020;
PAHs = polycyclic aromatic hydrocarbons by USEPA Method 8310; PCBs = polychlorinated biphenyls by Method 8081;
metals = arsenic by USEPA Methods 6010 and 7060, barium, cadmium, chromium and silver by USEPA Method 6010, lead by USEPA Methods 6010 and 7421, mercury by USEPA Method 7470, and selenium by USEPA Method 6010 and 7740;
VOCs = volatile organic compounds by USEPA Method 8260;
^a Field duplicate samples.

Table 2
Petroleum Hydrocarbons in Soil
WSDOT SR 519 Preliminary Site Investigation
Seattle, Washington

Sample Location	Sample Number	Date Sampled	MTC A Cleanup Levels ^a									
			TPH-G (mg/kg)	TPH-D (mg/kg)	TPH-O (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	m,p-Xylenes (mg/kg)	o-Xylenes (mg/kg)		
			100	200	200	0.5	40	20	20 ^b	20 ^b		
SB-01	SB-1-20	9/29/97	<6.6	<33	<66	<0.066	<0.066	<0.066	<0.066	<0.066	<0.066	
SB-01	SB-1-5	9/29/97	<5.5	<27	<55	<0.055	<0.055	<0.055	<0.055	<0.055	<0.055	
SB-03	SB-3-5	9/29/97	<6.0	<30	<60	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	
SB-03	SB-3-25 ^c	9/29/97	<6.3	<31	<63	<0.063	<0.063	<0.063	<0.063	<0.063	<0.063	
SB-03	SB-68-30 ^c	9/29/97	<6.8	<34	<68	<0.068	<0.068	<0.068	<0.068	<0.068	<0.068	
SB-05	SB-5-5	9/29/97	<6.2	<31	<62	<0.062	<0.062	<0.062	<0.062	<0.062	<0.062	
SB-05	SB-5-25	9/29/97	<6.8	<34	<68	<0.068	<0.068	<0.068	<0.068	<0.068	<0.068	
SB-06	SB-6-5	9/29/97	<6.1	<30	<61	<0.061	0.061	0.061	<0.061	<0.061	<0.061	
SB-06	SB-6-30 ^c	9/29/97	<6.4	<32	<64	0.064	0.26	0.26	<0.064	0.26	0.13	
SB-06	SB-67-30 ^c	9/29/97	<6.3	<31	<63	<0.063	<0.063	<0.063	<0.063	<0.063	<0.063	
SB-07	SB-7-5	10/6/97	<6.0	66	130	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	
SB-07	SB-7-25	10/6/97	<7.1	<36	<71	<0.071	<0.071	<0.071	<0.071	<0.071	<0.071	
SB-08	SS-8-5	9/8/97	<5.6	<28	<56	<0.056	<0.056	<0.056	<0.056	<0.056	<0.056	
SB-08	SS-8-20	9/8/97	<6.4	<32	<64	<0.064	<0.064	<0.064	<0.064	<0.064	<0.064	
SB-09	SS-9-10	8/28/97	<6.5	<32	<65	0.080	<0.065	<0.065	<0.065	<0.065	<0.065	
SB-09	SS-9-20	9/3/97	<6.1	<30	<61	<0.061	<0.061	<0.061	<0.061	<0.061	<0.061	
SB-10	SS-10-5	9/3/97	<6.0	<30	64	0.44	<0.060	<0.060	<0.060	<0.060	<0.060	
SB-10	SS-10-20	9/3/97	<6.3	<32	<63	<0.063	<0.063	<0.063	<0.063	<0.063	<0.063	
SB-11	SS-11-5	9/3/97	<6.3	<31	<63	<0.063	<0.063	<0.063	<0.063	<0.063	<0.063	
SB-11	SS-11-25	9/3/97	<6.2	43	69	<0.062	<0.062	<0.062	<0.062	<0.062	<0.062	
SB-12	SS-12-5	9/9/97	<6.4	<32	<64	<0.064	<0.064	<0.064	<0.064	<0.064	<0.064	
SB-12	SS-12-17	9/9/97	<6.8	<34	<68	<0.068	<0.068	<0.068	<0.068	<0.068	<0.068	
SB-13	SB-13-10	9/17/97	<6.6	41	67	<0.066	<0.066	<0.066	<0.066	<0.066	<0.066	
SB-13	SB-13-20	9/17/97	<7.5	65	84	<0.075	<0.075	<0.075	<0.075	<0.075	<0.075	
SB-14	SB-14-5	9/16/97	<28	33	69	<0.28	<0.28	<0.28	0.56	0.56	<0.28	
SB-14	SB-14-25	9/16/97	<33	<33	<66	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	
SB-15	SB-15-5	9/19/97	<5.9	<29	<59	<0.059	<0.059	<0.059	<0.059	<0.059	<0.059	
SB-15	SB-15-25	9/19/97	<5.8	<29	<58	<0.058	<0.058	<0.058	<0.058	<0.058	<0.058	
SB-16	SB-16-5	9/23/97	<5.9	<29	<59	<0.059	<0.059	<0.059	<0.059	<0.059	<0.059	
SB-16	SB-16-25	9/23/97	<6.6	<33	<66	<0.066	<0.066	<0.066	<0.066	<0.066	<0.066	

Table 2
Petroleum Hydrocarbons in Soil
WSDOT SR 519 Preliminary Site Investigation
Seattle, Washington

Sample Location	Sample Number	Date Sampled	MTCA Method A Cleanup Levels ^a						o-Xylenes (mg/kg)		
			TPH-G (mg/kg)	TPH-D (mg/kg)	TPH-O (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	m,p-Xylenes (mg/kg)	20 ^b	
SB-17	SB-17-15 ^c	9/23/97	<6.6	<33	<66	<0.066	<0.066	<0.066	<0.066	<0.066	<0.066
SB-17	SB-45-15 ^c	9/23/97	<6.3	<31	<63	<0.063	<0.063	<0.063	<0.063	<0.063	<0.063
SB-17	SB-17-20	9/23/97	<7.6	50	<76	<0.076	<0.076	0.076	0.076	0.076	<0.076
SB-18	SS-18-15	8/25/97	6.2	<30	<61	<0.061	<0.061	<0.061	<0.061	<0.061	<0.061
SB-18	SS-18-20	8/25/97	20	5200	1900	<0.077	<0.077	<0.077	<0.077	0.36	0.17
SB-18 (well)	SS-18-25	8/28/97	44	370	730	<0.076	<0.076	0.28	1.8	2.5	0.83
SB-19	SB-19-5	10/9/97	<6.7	<33	<67	<0.067	<0.067	<0.067	<0.067	0.098	<0.067
SB-19	SB-19-20	10/9/97	<6.6	<33	<66	<0.066	<0.066	<0.066	<0.066	<0.066	<0.066
SB-20	SB-20-5	10/8/97	<6.2	<31	<62	<0.062	<0.062	<0.062	<0.062	<0.062	<0.062
SB-20	SB-20-20	10/8/97	<7.4	<37	<74	<0.074	<0.074	<0.074	<0.074	<0.074	<0.074
SB-21	SB-21-5	10/8/97	82	82	350	<0.068	<0.068	0.088	0.13	0.42	0.13
SB-21	SB-21-25	10/8/97	<6.5	<32	<65	<0.065	<0.065	<0.065	<0.065	<0.065	<0.065
SB-22	SB-22-5	9/25/97	<6.7	<33	<67	<0.067	<0.067	<0.067	<0.067	<0.067	<0.067
SB-22	SB-22-25	9/25/97	<6.4	<32	<64	<0.064	<0.064	<0.064	<0.064	<0.064	<0.064
SB-23	SB-23-5	9/11/97	<6.4	<32	<64	<0.064	<0.064	<0.064	<0.064	<0.064	<0.064
SB-23	SB-23-25	9/11/97	8.3	<37	<75	0.075	0.075	0.15	<0.075	0.22	0.075
SB-24	SB-24-5	9/12/97	<6.4	<32	<64	<0.064	<0.064	<0.064	<0.064	<0.064	<0.064
SB-24	SB-24-25	9/12/97	<6.7	<33	<67	<0.067	<0.067	0.067	<0.067	0.13	0.067
SB-25	SB-25-5	10/3/97	<6.0	<30	<60	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060
SB-25	SB-25-25	10/3/97	<6.8	<170	2900	<0.068	<0.068	<0.068	<0.068	<0.068	<0.068
SB-26	SB-26-5	10/3/97	<6.3	<32	<63	<0.063	<0.063	<0.063	<0.063	<0.063	<0.063
SB-26	SB-26-25	10/3/97	<6.8	<32	<65	<0.068	<0.068	0.068	<0.068	0.14	<0.068
SB-27	SB-27-5	10/13/97	<5.6	<28	<56	<0.056	<0.056	<0.056	<0.056	<0.056	<0.056
SB-27	SB-27-25	10/13/97	<6.4	<32	<64	<0.064	<0.064	<0.064	<0.064	<0.064	<0.064
SB-28	SB-28-5	10/3/97	1300	97	<61	<0.061	<0.061	0.12	0.67	2.2	3.3
SB-28	SB-28-20	10/3/97	<7.0	<35	<70	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070
SB-29	SB-29-5	9/29/97	<6.7	<33	<67	<0.067	<0.067	<0.067	<0.067	<0.067	<0.067
SB-29	SB-29-25	9/29/97	<6.9	<35	<69	<0.069	<0.069	<0.069	<0.069	<0.069	<0.069
SB-30	SB-30-5	10/3/97	<6.6	<33	<66	1.7	<0.066	<0.066	<0.066	0.46	0.13
SB-30	SB-30-25	10/3/97	<6.7	<33	<67	<0.067	<0.067	<0.067	<0.067	<0.067	<0.067

Table 2
Petroleum Hydrocarbons in Soil
WSDOT SR 519 Preliminary Site Investigation
Seattle, Washington

Sample Location	Sample Number	Date Sampled	MTC A Cleanup Levels ^a									
			TPH-G (mg/kg)	TPH-D (mg/kg)	TPH-O (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	m,p-Xylenes (mg/kg)	o-Xylenes (mg/kg)		
SB-31	SB-31-5	10/3/97	<6.3	<31	<63	<0.063	<0.063	<0.063	<0.063	<0.063	<0.063	<0.063
SB-31	SB-31-25	10/3/97	<7.0	<35	<70	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070
SB-32	SB-32-5	10/3/97	<6.4	<32	<64	0.26	<0.064	<0.064	<0.064	<0.064	<0.064	<0.064
SB-32	SB-32-25	10/3/97	<6.6	<33	<66	<0.066	<0.066	<0.066	<0.066	<0.066	<0.066	<0.066
SB-33	SB-33-5	9/24/97	<6.8	<34	<68	<0.068	<0.068	<0.068	<0.068	<0.068	<0.068	<0.068
SB-33	SB-33-25 ^c	9/24/97	<7.1	<36	<71	<0.071	<0.071	<0.071	<0.071	<0.071	<0.071	<0.071
SB-33	SB-33-25D ^c	9/24/97	<7.4	<37	<74	<0.074	<0.074	<0.074	<0.074	<0.074	<0.074	<0.074
SB-34	SS-34-5	9/5/97	<5.7	<29	<57	<0.057	<0.057	<0.057	<0.057	<0.057	<0.057	<0.057
SB-34	SS-34-15	9/5/97	<6.4	<32	<64	<0.064	<0.064	<0.064	<0.064	<0.064	<0.064	<0.064
SB-35	SS-35-5	9/5/97	<5.7	<28	<57	<0.057	<0.057	<0.057	<0.057	<0.057	<0.057	<0.057
SB-35	SS-35-20	9/5/97	<6.5	<36	<71	<0.065	<0.065	<0.065	<0.065	<0.065	<0.065	<0.065
SB-36	SB-36-5	10/8/97	<6.7	<33	<67	<0.067	<0.067	<0.067	<0.067	<0.067	<0.067	<0.067
SB-36	SB-36-20	10/8/97	<7.7	<38	<77	0.088	0.42	0.11	0.4	0.13	0.13	0.13
SB-38	SB-38-5	10/13/97	<6.7	<33	<67	0.67	0.093	0.071	0.12	0.12	0.12	0.12
SB-38	SB-38-25	10/13/97	<7.1	<36	<71	<0.071	<0.071	<0.071	<0.071	<0.071	<0.071	<0.071
SB-39	SB-39-10	10/3/97	<6.0	<30	<60	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060
SB-39	SB-39-25	10/3/97	<6.8	<34	<68	<0.068	<0.068	<0.068	<0.068	<0.068	<0.068	<0.068
SB-40	SB-40-5	10/3/97	<6.4	<32	<64	<0.064	<0.064	<0.064	<0.064	<0.064	<0.064	<0.064
SB-40	SB-40-30	10/3/97	<6.5	<32	<65	<0.065	<0.065	<0.065	<0.065	<0.065	<0.065	<0.065

NOTE: mg/kg = milligrams per kilogram.

< = not-detected at or above the reporting limit shown.

Bold values indicate detected compound; shaded values indicate concentration greater than Method A Cleanup Level.

^a Chapter 173-340 WAC, The Model Toxics Control Act Cleanup Regulations, Method A Cleanup Levels.

^b The Method A Cleanup Levels for xylenes are for total (m-, p-, and o-) xylenes.

^c Field duplicate samples.

Table 3

**Polycyclic Aromatic Hydrocarbons in Soil
WSDOT SR 519 Preliminary Site Investigation
Seattle, Washington**

Compound	Units	Location Sample Number	SB-14 SB-14-5	SB-17 SB-17-20	SB-18 SS-18-15	SB-28 SB-28-5	SB-28 SB-28-20
Acenaphthene	mg/kg		<0.037	6.6	<0.041	<0.041	<0.047
Acenaphthylene	mg/kg		<0.037	1.1	<0.041	<0.041	<0.047
Anthracene	mg/kg		<0.037	5.4	<0.041	<0.041	<0.047
Benzo(a)anthracene	mg/kg	Carcinogenic	<0.037	3.2	<0.041	<0.041	<0.047
Benzo(a)pyrene	mg/kg	Carcinogenic	1.4	3.8	<0.041	<0.041	<0.047
Benzo(b)fluoranthene	mg/kg	Carcinogenic	5.7	1.6	<0.041	<0.041	<0.047
Benzo(g,h,i)perylene	mg/kg		2.2	1.7	<0.041	<0.041	<0.047
Benzo(k)fluoranthene	mg/kg	Carcinogenic	1.7	2.1	<0.041	<0.041	<0.047
Chrysene	mg/kg	Carcinogenic	3.5	3.5	0.14	<0.041	<0.047
Dibenzo(a,h)anthracene	mg/kg	Carcinogenic	1.1	0.63	<0.041	<0.041	<0.047
Fluoranthene	mg/kg		0.89	7.5	<0.041	<0.041	<0.047
Fluorene	mg/kg		<0.037	4.9	<0.041	<0.041	<0.047
Indeno(1,2,3-cd)pyrene	mg/kg		2	1.6	<0.041	<0.041	<0.047
2-Methylnaphthalene	mg/kg	Carcinogenic	<0.037	5.3	<0.041	0.052	<0.047
Naphthalene	mg/kg		<0.037	5.6	<0.041	<0.041	<0.047
Phenanthrene	mg/kg		0.095	17	<0.041	<0.041	<0.047
Pyrene	mg/kg		0.8	9.5	0.046	<0.041	<0.047
Total Carcinogenic PAH ^a	mg/kg		15.4	16.83	0.14	<0.041	<0.047

NOTE: mg/kg = milligrams per kilogram.

< = not-detected at or above the reporting limit shown.

Bold values indicate detected compound; shaded values indicate concentration greater than Method A Cleanup Level.

^a Chapter 173-340 WAC, The Model Toxics Control Act Cleanup Regulations, Method A Cleanup Levels for total carcinogenic PAHs are 1.0 mg/kg.

Table 4

Volatile Organic Compounds in Soil
WSDOT SR 519 Preliminary Site Investigation
Seattle, Washington

Compound	MTCA Method A Cleanup Levels* (mg/kg)	Sample Number													
		Concentration (mg/kg)													
		SB-8-20	SB-9-20	SB-10-20	SB-11-23	SB-12-5	SB-13-20	SB-14-5	SB-17-20	SS-18-15	SB-28-5	SB-28-20	SB-34-15	SB-35-20	
Naphthalene	---	< 0.56	< 0.54	< 0.63	< 0.62	< 0.64	< 0.75	< 0.56	15	< 0.61	< 0.61	< 0.64	< 0.65		
n-Propylbenzene	---	< 0.56	< 0.54	< 0.63	< 0.62	< 0.64	< 0.75	< 0.56	< 0.76	< 0.61	< 0.61	< 0.64	< 0.65		
Styrene	---	< 0.56	< 0.54	< 0.63	< 0.62	< 0.64	< 0.75	< 0.56	< 0.76	< 0.61	< 0.61	< 0.64	< 0.65		
1,1,1,2-Tetrachloroethane	---	< 0.56	< 0.54	< 0.63	< 0.62	< 0.64	< 0.75	< 0.56	< 0.76	< 0.61	< 0.61	< 0.64	< 0.65		
1,1,2,2-Tetrachloroethane	---	< 0.56	< 0.54	< 0.63	< 0.62	< 0.64	< 0.75	< 0.56	< 0.76	< 0.61	< 0.61	< 0.64	< 0.65		
Tetrachloroethene (PCE)	0.5	< 0.56	< 0.54	< 0.63	< 0.62	< 0.64	< 0.75	< 0.56	< 0.76	< 0.61	< 0.61	< 0.64	< 0.65		
Toluene	40	< 0.56	< 0.54	< 0.63	< 0.62	< 0.64	0.08	< 0.56	< 0.76	< 0.61	< 0.61	< 0.64	< 0.65		
1,2,3-Trichlorobenzene	---	< 0.56	< 0.54	< 0.63	< 0.62	< 0.64	< 0.75	< 0.56	< 0.76	< 0.61	< 0.61	< 0.64	< 0.65		
1,2,4-Trichlorobenzene	---	< 0.56	< 0.54	< 0.63	< 0.62	< 0.64	< 0.75	< 0.56	< 0.76	< 0.61	< 0.61	< 0.64	< 0.65		
1,1,1-Trichloroethane (TCA)	20	< 0.56	< 0.54	< 0.63	< 0.62	< 0.64	< 0.75	< 0.56	< 0.76	< 0.61	< 0.61	< 0.64	< 0.65		
1,1,2-Trichloroethane	---	< 0.56	< 0.54	< 0.63	< 0.62	< 0.64	< 0.75	< 0.56	< 0.76	< 0.61	< 0.61	< 0.64	< 0.65		
1,2,4-Trimethylbenzene	---	< 0.56	< 0.54	< 0.63	< 0.62	< 0.64	< 0.75	< 0.56	0.2	< 0.61	< 0.61	< 0.64	< 0.65		
1,3,5-Trimethylbenzene	---	< 0.56	< 0.54	< 0.63	< 0.62	< 0.64	< 0.75	< 0.56	< 0.76	< 0.61	< 0.61	< 0.64	< 0.65		
Trichlorofluoromethane (CFC 11)	---	< 0.56	< 0.54	< 0.63	< 0.62	< 0.64	< 0.75	< 0.56	< 0.76	< 0.61	< 0.61	< 0.64	< 0.65		
1,2,3-Trichloropropane	---	< 0.56	< 0.54	< 0.63	< 0.62	< 0.64	< 0.75	< 0.56	< 0.76	< 0.61	< 0.61	< 0.64	< 0.65		
Trichloroethene (TCE)	0.5	< 0.56	< 0.54	< 0.63	< 0.62	< 0.64	< 0.75	< 0.56	< 0.76	< 0.61	< 0.61	< 0.64	< 0.65		
Vinyl Chloride	---	< 0.56	< 0.54	< 0.63	< 0.62	< 0.64	0.08	< 0.56	< 0.76	< 0.61	< 0.61	< 0.64	< 0.65		
m,p-Xylenes	20 ^b	< 0.11	< 0.11	< 0.13	< 0.12	< 0.13	< 0.15	< 0.11	< 0.15	< 0.12	< 0.12	< 0.13	< 0.13		
o-Xylene	20 ^b	< 0.56	< 0.54	< 0.63	< 0.62	< 0.64	< 0.75	< 0.56	< 0.60	< 0.61	< 0.61	< 0.64	< 0.65		

NOTE: mg/kg = milligrams per kilogram.

< = not detected at or above the reporting limit shown. *B* indicates compound was also detected in a blank.

--- indicates not available.

Bold values indicate compound was detected; shaded values indicate concentration greater than Method A Cleanup Level.

* Chapter 173-340 WAC, The Model Toxics Control Act Cleanup Regulations, Method A Cleanup Levels.

^b MTCA Method A Cleanup Levels for xylenes are for total (m-, p-, and o-) xylenes.

Table 5

Metals in Soils
WSDOT SR 519 Preliminary Site Investigation
Seattle, Washington

Sample Location	Sample Number	Date Sampled	Arsenic (mg/kg)	Barium (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Lead (mg/kg)	Mercury (mg/kg)	Selenium (mg/kg)	Silver (mg/kg)
MTCA Method A Cleanup Levels ^a										
SB-01	SB-1-5	9/29/97	20	---	2.0	100	250	1.0	---	---
SB-01	SB-1-20	9/29/97	6.1	39	<0.55	22	6.8	<0.27	<11	<0.55
SB-03	SB-3-5	9/29/97	7.3	21	<0.66	13	<6.6	<0.33	<13	<0.66
SB-03	SB-3-25 ^b	9/29/97	12	94	<0.60	40	9.8	<0.30	<12	<0.60
SB-03	SB-68-30 ^b	9/29/97	5.9	20	<0.63	10	<6.3	<0.31	<13	<0.63
SB-05	SB-5-5	9/29/97	5.9	35	<0.68	11	9.2	<0.34	<14	<0.68
SB-05	SB-5-25	9/29/97	12	76	<0.62	32	<6.2	<0.31	<12	<0.62
SB-06	SB-6-5	9/29/97	4.2	11	<0.68	8.8	<6.8	<0.34	<14	<0.68
SB-06	SB-6-30 ^b	9/29/97	12	100	<0.61	39	<6.1	<0.30	<12	<0.61
SB-06	SB-6-30 ^b	9/29/97	4.5	9.4	<0.64	7.2	<6.4	<0.32	<13	<0.64
SB-07	SB-7-5	9/29/97	4.5	9	<0.63	7.6	<6.3	<0.31	<13	<0.63
SB-07	SB-7-25	10/6/97	10	100	<0.60	40	36	<0.30	<12	<0.60
SB-08	SS-8-5	10/6/97	5.8	18	<0.71	13	<7.1	<0.36	<14	<0.71
SB-08	SS-8-20	9/8/97	<0.67	58	<0.56	30	6.1	<0.28	<11	<0.56
SB-09	SS-9-10	9/8/97	0.83	110	<0.64	55	18	<0.32	<13	<0.64
SB-09	SS-9-20	8/28/97	<0.97	110	<0.65	58	<6.5	<0.32	<13	<0.65
SB-10	SS-10-5	9/3/97	1	84	<0.61	38	11	<0.30	<12	<0.61
SB-10	SS-10-20	9/3/97	<0.71	98	<0.60	22	9.7	<0.30	<12	<0.60
SB-11	SS-11-5	9/3/97	<0.76	73	<0.63	37	<6.3	<0.32	<13	<0.63
SB-11	SS-11-25	9/3/97	<0.75	120	<0.63	35	23	<0.31	<13	<0.63
SB-12	SS-12-5	9/9/97	1.1	18	<0.62	11	<6.2	<0.31	<12	<0.62
SB-12	SS-12-17	9/9/97	11	150	<0.64	47	27	<0.32	<13	<0.64
SB-13	SB-13-10	9/17/97	5	99	<0.68	39	24	<0.34	<14	<0.68
SB-13	SB-13-20	9/17/97	8.1	120	<0.66	46	8.4	<0.33	<13	<0.66
SB-14	SB-14-5	9/16/97	8.6	120	<0.75	56	27	<0.37	<15	<0.75
SB-14	SB-14-25	9/16/97	5.6	62	<0.56	24	22	<0.28	<11	<0.56
SB-15	SB-15-5	9/19/97	5.7	76	<0.66	41	<6.6	<0.33	<13	<0.66
SB-15	SB-15-25	9/19/97	4.6	62	<0.59	26	<5.9	<0.29	<12	<0.59
SB-15	SB-15-25	9/19/97	3	30	<0.58	19	<5.8	<0.29	<12	<0.58

Table 5

Metals in Soils
WSDOT SR 519 Preliminary Site Investigation
Seattle, Washington

Sample Location	Sample Number	Date Sampled	Arsenic (mg/kg)	Barium (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Lead (mg/kg)	Mercury (mg/kg)	Selenium (mg/kg)	Silver (mg/kg)
MTCA Method A Cleanup Levels ^a										
SB-16	SB-16-5	9/23/97	20	---	2.0	100	250	1.0	---	---
SB-16	SB-16-25	9/23/97	5.3	68	<0.59	20	<5.9	<0.29	<12	<0.59
SB-17	SB-17-15 ^b	9/23/97	1.8	19	<0.66	17	<6.6	<0.33	<13	<0.66
SB-17	SB-17-15 ^b	9/23/97	3.5	87	<0.66	49	9.5	<0.33	<13	<0.66
SB-17	SB-45-15 ^b	9/23/97	1.8	66	<0.63	37	<6.3	<0.31	<13	<0.63
SB-17	SB-17-20	9/23/97	6.9	99	<0.76	58	11	<0.38	<15	<0.76
SB-18	SS-18-15	8/25/97	<0.91	85	<0.61	38	9.3	<0.30	<12	<0.61
SB-18	SS-18-20	8/25/97	<1.2	82	<0.77	46	22	<0.38	<15	<0.77
SB-18 (well)	SS-18-25	8/28/97	<1.1	34	<0.76	21	9.9	<0.38	<15	<0.76
SB-19	SB-19-5	10/9/97	14	110	<0.67	51	<6.7	<0.33	<13	<0.67
SB-19	SB-19-20	10/9/97	12	110	<0.66	51	<6.6	<0.33	<13	<0.66
SB-20	SB-20-5	10/8/97	6.5	65	<0.62	29	16	<0.31	<12	0.86
SB-20	SB-20-20	10/8/97	12	58	<0.74	45	8.8	<0.37	<15	1.1
SB-21	SB-21-5	10/8/97	4.4	330	<0.68	4.7	7.1	<0.34	<14	<0.68
SB-21	SB-21-25	10/8/97	1.5	6	<0.65	3.3	<6.5	<0.32	<13	<0.65
SB-22	SB-22-5	9/25/97	6.4	130	<0.67	53	9.9	<0.33	<13	<0.67
SB-22	SB-22-25	9/25/97	1.8	14	<0.64	11	<6.4	<0.32	<13	<0.64
SB-23	SB-23-5	9/11/97	7.9	120	<0.64	45	8.7	<0.32	<13	<0.64
SB-23	SB-23-25	9/11/97	7.4	93	<0.75	65	26	<0.37	<15	<0.75
SB-24	SB-24-5	9/12/97	7.7	120	<0.64	44	20	<0.32	<13	<0.64
SB-24	SB-24-25	9/12/97	3.1	24	<0.67	18	<6.7	<0.33	<13	<0.67
SB-25	SB-25-5	10/3/97	7.4	60	<0.60	29	8.3	<0.30	<12	<0.60
SB-25	SB-25-25	10/3/97	6.4	24	<0.68	16	<6.8	<0.34	<14	<0.68
SB-26	SB-26-5	10/3/97	9.9	83	<0.63	40	<6.3	<0.32	<13	<0.63
SB-26	SB-26-25	10/3/97	2.8	11	<0.65	8.6	<6.5	<0.32	<13	<0.65
SB-27	SB-27-5	10/13/97	7.9	48	<0.56	20	<5.6	<0.28	<11	<0.56
SB-27	SB-27-25	10/13/97	5.1	13	<0.64	9.2	<6.4	<0.32	<13	<0.64
SB-28	SB-28-5	10/3/97	17	130	<0.61	57	16	<0.30	<12	<0.61
SB-28	SB-28-20	10/3/97	9.7	61	<0.70	41	15	<0.35	<14	<0.70
SB-29	SB-29-5	9/29/97	9.7	92	<0.67	41	<6.7	<0.33	<13	<0.67

Table 5

Metals in Soils
WSDOT SR 519 Preliminary Site Investigation
Seattle, Washington

Sample Location	Sample Number	Date Sampled	Arsenic (mg/kg)	Barium (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Lead (mg/kg)	Mercury (mg/kg)	Selenium (mg/kg)	Silver (mg/kg)
MICA Method A Cleanup Levels ^a										
SB-29	SB-29-25	9/29/97	20	---	2.0	100	250	1.0	---	---
SB-30	SB-30-5	10/3/97	5.8	17	<0.69	12	<6.9	<0.35	<14	<0.69
SB-30	SB-30-5	10/3/97	19	130	<0.66	67	13	<0.33	<13	<0.66
SB-30	SB-30-25	10/3/97	6.2	20	<0.67	14	<6.7	<0.33	<13	<0.67
SB-31	SB-31-5	10/3/97	13	110	<0.63	55	27	<0.31	<13	<0.63
SB-31	SB-31-25	10/3/97	6.5	21	<0.70	17	<7.0	<0.35	<14	<0.70
SB-32	SB-32-5	10/3/97	11	120	<0.64	50	14	<0.32	<13	<0.64
SB-32	SB-32-25	10/3/97	3.9	16	<0.66	11	<6.6	<0.33	<13	<0.66
SB-33	SB-33-5	9/24/97	7.2	140	<0.68	50	<6.8	<0.34	<14	<0.68
SB-33	SB-33-25 ^b	9/24/97	6.5	85	<0.71	60	12	<0.36	<14	<0.71
SB-33	SB-33-25D ^b	9/24/97	5.7	88	<0.74	58	9.7	<0.37	<15	<0.74
SB-34	SS-34-5	9/5/97	0.77	33	<0.57	18	<5.7	<0.29	<11	<0.57
SB-34	SS-34-15	9/5/97	1.5	75	<0.64	43	14	<0.32	<13	<0.64
SB-35	SS-35-5	9/5/97	0.99	47	<0.57	18	<5.7	<0.28	<11	<0.57
SB-35	SS-35-20	9/5/97	<0.78	61	<0.65	24	9.5	<0.32	<13	<0.65
SB-36	SB-36-5	10/8/97	13	130	<0.67	60	7.2	<0.33	<13	<0.67
SB-36	SB-36-20	10/8/97	12	72	<0.77	64	8.5	<0.38	<15	<0.77
SB-38	SB-38-5	10/13/97	13	140	<0.67	57	8.1	<0.33	<13	<0.67
SB-38	SB-38-25	10/13/97	9.9	85	<0.71	51	9.2	<0.36	<14	<0.71
SB-39	SB-39-10	10/3/97	8.7	86	<0.60	41	26	<0.30	<12	<0.60
SB-39	SB-39-25	10/3/97	4.6	17	<0.68	11	<6.8	<0.34	<14	<0.68
SB-40	SB-40-5	10/3/97	14	140	<0.64	61	14	<0.32	<13	<0.64
SB-40	SB-40-30	10/3/97	<0.78	7.2	<0.65	5.2	<6.5	<0.32	<13	<0.65

NOTE: mg/kg = milligrams per kilogram.

< = not-detected at or above the reporting limit shown.

Bold values indicate element was detected; shaded values indicate concentration greater than Method A Cleanup Level.

--- indicates not available.

^a Chapter 173-340 WAC, The Model Toxics Control Act Cleanup Regulations, Method A Cleanup Levels.

^b Field duplicate samples.

Table 6

**Polychlorinated Biphenyls in Soil
WSDOT SR 519 Preliminary Site Investigation
Seattle, Washington**

Sample Location:		SB-17	SB-18
Sample Number:		SB-17-20	SS-18-15
Compound	Units		
Aroclor 1016	mg/kg	< 0.08	< 0.012
Aroclor 1221	mg/kg	< 0.08	< 0.012
Aroclor 1232	mg/kg	< 0.08	< 0.012
Aroclor 1242	mg/kg	< 0.08	< 0.012
Aroclor 1248	mg/kg	< 0.08	< 0.012
Aroclor 1254	mg/kg	< 0.08	< 0.012
Aroclor 1260	mg/kg	< 0.08	< 0.012
Total PCBs ^a	mg/kg	< 0.08	< 0.012

NOTE: mg/kg = milligrams per kilogram.
 < = not-detected at or above the reporting limit shown.
^a Chapter 173-340 WAC, The Model Toxics Control Act Cleanup Regulations, Method A Cleanup Levels for PCB mixtures are 1.0 mg/kg.

Table 7

Petroleum Hydrocarbons in Groundwater
 WSDOT SR 519 Preliminary Site Investigation
 Seattle, Washington

Sample Location	Sample Number	Date Sampled	TPH-G (mg/L)	TPH-D (mg/L)	TPH-O (mg/L)	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	m,p-Xylenes (mg/L)	o-Xylenes (mg/L)
MTCA Method A Cleanup Levels ^a										
SB-05	MW-5-0997	9/28/97	<0.1	<0.5	<1.0	0.005	0.040	0.030	0.020 ^b	0.020 ^b
SB-18	MW-18-109	10/22/97	<0.1	11	<1.0	<0.001	<0.001	<0.001	<0.001	<0.001
SB-24	MW-24-109	10/3/97	<0.1	<0.5	<1.0	<0.001	<0.001	0.0024	0.0026	<0.001
SB-34	SS-34-0997	9/5/97	<0.1	<0.5	<1.0	<0.001	<0.001	<0.001	<0.001	<0.001
SB-35	MW-35-109	10/6/97	<0.1	<0.5	<1.0	<0.001	<0.001	<0.001	<0.001	<0.001
SB-40	MW-40-109	10/22/97	<0.1	<0.5	<1.0	<0.001	<0.001	<0.001	<0.001	<0.001

Notes: mg/L = milligrams per liter.

< = not-detected at or above the reporting limit shown.

Bold values indicate analyte was detected, shaded values indicate concentration greater than Method A Cleanup Level.

^a Chapter 173-340 WAC, The Model Toxics Control Act Cleanup Regulations, Method A Cleanup Levels.

^b The Method A Cleanup Levels for xylenes are for total (m-, p-, and o-) xylenes.

Table 8

**Volatile Organic Compounds in Groundwater
WSDOT SR 519 Preliminary Site Investigation
Seattle, Washington**

Compound	MTCA Method A Cleanup Levels ^a (mg/L)	Sample Number Concentration (mg/L)		
		MW-5-0997	MW-18-1097	SS-34-0997
Benzene	0.0050	< 0.001	< 0.001	< 0.001
Bromobenzene	---	< 0.001	< 0.001	< 0.001
Bromodichloromethane	---	< 0.001	< 0.001	< 0.001
Bromoform	---	< 0.001	< 0.001	< 0.001
Bromomethane	---	< 0.001	< 0.001	< 0.001
n-Butylbenzene	---	< 0.001	< 0.001	< 0.001
sec-Butylbenzene	---	< 0.001	< 0.001	< 0.001
tert-Butylbenzene	---	< 0.001	< 0.001	< 0.001
Carbon Tetrachloride	---	< 0.005	< 0.005	< 0.005
Chlorobenzene	---	< 0.001	< 0.001	< 0.001
Chloroethane	---	< 0.001	< 0.001	< 0.001
Chloroform	---	< 0.001	< 0.001	< 0.001
Chloromethane	---	< 0.001	< 0.001	< 0.001
2-Chlorotoluene	---	< 0.001	< 0.001	< 0.001
4-Chlorotoluene	---	< 0.001	< 0.001	< 0.001
Dibromochloromethane	---	< 0.001	< 0.001	< 0.001
Dibromomethane	---	< 0.001	< 0.001	< 0.001
Dichlorodifluoromethane	---	< 0.001	< 0.001	< 0.001
1,2-Dibromoethane	---	< 0.001	< 0.001	< 0.001
1,3-Dichlorobenzene	---	< 0.001	< 0.001	< 0.001
1,4-Dichlorobenzene	---	< 0.001	< 0.001	< 0.001
1,2-Dichlorobenzene	---	< 0.001	< 0.001	< 0.001
1,2-Dibromo-3-chloropropane	---	< 0.005	< 0.005	< 0.005
1,1-Dichloroethane	---	< 0.001	< 0.001	< 0.001
1,2-Dichloroethane	0.0050	< 0.001	< 0.001	< 0.001
1,1-Dichloroethene	---	< 0.001	< 0.001	< 0.001
(cis) 1,2-Dichloroethene	---	< 0.001	0.0014	< 0.001
(trans) 1,2-Dichloroethene	---	< 0.001	< 0.001	< 0.001
1,2-Dichloropropane	---	< 0.001	< 0.001	< 0.001
1,3-Dichloropropane	---	< 0.001	< 0.001	< 0.001
2,2-Dichloropropane	---	< 0.001	< 0.001	< 0.001
1,1-Dichloropropene	---	< 0.001	< 0.001	< 0.001
cis-1,3-Dichloropropene	---	< 0.001	< 0.001	< 0.001
trans-1,3-Dichloropropene	---	< 0.001	< 0.001	< 0.001
Ethylbenzene	0.030	< 0.001	< 0.001	< 0.001
Hexachlorobutadiene	---	< 0.001	< 0.001	< 0.001
Isopropylbenzene	---	< 0.001	< 0.001	< 0.001
p-Isopropyltoluene	---	< 0.001	< 0.001	< 0.001
Methylene Chloride	0.0050	0.0024 B	0.0028 B	0.0031 B
Naphthalene	---	< 0.005	0.029	< 0.005
n-Propylbenzene	---	< 0.001	< 0.001	< 0.001

Table 8

**Volatile Organic Compounds in Groundwater
WSDOT SR 519 Preliminary Site Investigation
Seattle, Washington**

Compound	MTC A Method A Cleanup Levels ^a (mg/L)	Sample Number Concentration (mg/L)		
		MW-5-0997	MW-18-1097	SS-34-0997
Styrene	---	< 0.001	< 0.001	< 0.001
1,1,1,2-Tetrachloroethane	---	< 0.001	< 0.001	< 0.001
1,1,2,2-Tetrachloroethane	---	< 0.001	< 0.001	< 0.001
Tetrachloroethene (PCE)	0.0050	< 0.001	< 0.001	< 0.001
Toluene	0.040	< 0.001	0.0021	< 0.001
1,2,3-Trichlorobenzene	---	< 0.001	< 0.001	< 0.001
1,2,4-Trichlorobenzene	---	< 0.001	< 0.001	< 0.001
1,1,1-Trichloroethane (TCA)	0.200	< 0.001	< 0.001	< 0.001
1,1,2-Trichloroethane	---	< 0.001	< 0.001	< 0.001
1,2,4-Trimethylbenzene	---	< 0.001	< 0.001	< 0.001
1,3,5-Trimethylbenzene	---	< 0.001	< 0.001	< 0.001
Trichlorofluoromethane (CFC 11)	---	< 0.001	< 0.001	< 0.001
1,2,3-Trichloropropane	---	< 0.001	< 0.001	< 0.001
Trichloroethene (TCE)	0.0050	< 0.001	0.0017	< 0.001
Vinyl Chloride	0.0002	< 0.001	0.0019	< 0.001
m,p-Xylenes	0.020 ^b	< 0.002	< 0.002	< 0.002
o-Xylene	0.020 ^b	< 0.001	< 0.001	< 0.001

Notes: mg/L = milligrams per liter.
 < = not-detected at or above the reporting limit shown. --- indicates not available.
 Bold values indicate analyte was detected.
 "B" indicates analyte was also detected in a blank.

^a Chapter 173-340 WAC, The Model Toxics Control Act Cleanup Regulations, Method A Cleanup Levels.
^b The Method A Cleanup Levels for xylenes are for total (m-, p-, and o-) xylenes.

Table 9

**Polycyclic Aromatic Hydrocarbons in Groundwater
WSDOT SR 519 Preliminary Site Investigation
Seattle, Washington**

Compound	Units	Sample Location: Sample Number: SB-18 MW-18-1097
Acenaphthene	mg/L	0.051
Acenaphthylene	mg/L	0.0034
Anthracene	mg/L	0.0052
Benzo(a)anthracene	mg/L	0.0013
Benzo(a)pyrene	mg/L	0.0011
Benzo(b)fluoranthene	mg/L	0.00053
Benzo(g,h,i)perylene	mg/L	< 0.0005
Benzo(k)fluoranthene	mg/L	0.00067
Chrysene	mg/L	0.0013
Dibenzo(a,h)anthracene	mg/L	< 0.0005
Fluoranthene	mg/L	0.0043
Fluorene	mg/L	0.027
Indeno(1,2,3-cd)pyrene	mg/L	< 0.0005
2-Methylnaphthalene	mg/L	0.130
Naphthalene	mg/L	0.320
Phenanthrene	mg/L	0.028
Pyrene	mg/L	0.0046
Total Carcinogenic PAHs	mg/L	0.0049

Notes: mg/L = milligrams per liter.

< = not detected at or above the reporting limit shown. Bold values indicate compound was detected

Shaded values indicate concentration was greater than Method A Cleanup Level.

The Model Toxics Control Act Cleanup Regulations, Method A Cleanup Levels specify a Method A

Cleanup Level of 0.0001 mg/L for the total concentration of carcinogenic PAHs.

Table 10

Metals in Groundwater
 WSDOT SR 519 Preliminary Site Investigation
 Seattle, Washington

Location	Sample Number	Arsenic (mg/L)	Barium (mg/L)	Cadmium (mg/L)	Chromium (mg/L)	Lead (mg/L)	Mercury (mg/L)	Selenium (mg/L)	Silver (mg/L)
MTCA Method A Cleanup Levels ^a		0.0050	---	0.0050	0.0500	0.0050	0.0020	---	---
SB-05	MW-5-0997	0.023	0.130	<0.004	0.042	0.0150	<0.0005	<0.005	<0.010
SB-05	MW-5-0997 (dissolved)	0.079	NA	NA	NA	<0.001	NA	NA	NA
SB-18	MW-18-1097	<0.003	0.052	<0.004	<0.010	0.0065	<0.0005	<0.006	<0.010
SB-18	MW-18-1097 (dissolved)	NA	NA	NA	NA	<0.001	NA	NA	NA
SB-24	MW-24-1097	0.035	0.610	<0.004	0.072	0.0370	<0.0005	<0.005	<0.010
SB-24	MW-24-1097 (dissolved)	0.0041	NA	NA	<0.010	<0.001	NA	NA	NA
SB-34	SS-34-0997	0.0087	0.053	<0.0044	<0.010	<0.0011	<0.0005	<0.0033	<0.010
SB-34	SS-34-0997 (dissolved)	0.0061	NA	NA	NA	NA	NA	NA	NA
SB-35	MW-35-1097	0.016	0.130	<0.004	0.011	0.0044	<0.0005	<0.005	<0.010
SB-35	MW-35-1097 (dissolved)	<0.003	NA	NA	NA	NA	NA	NA	NA
SB-40	MW-40-1097	0.006	0.120	<0.004	<0.010	0.0052	<0.0005	<0.006	<0.010
SB-40	MW-40-1097 (dissolved)	0.012	NA	NA	NA	<0.001	NA	NA	NA

Notes: mg/L = milligrams per liter. Dissolved results from analysis of field filtered sample.
 Dissolved analysis undertaken based on exceedance of MTCA criteria in totals analysis. NA = not analyzed
 < = not-detected at or above the reporting limit shown. --- indicates not available.
 Bold values indicate analyte was detected; shaded values indicate concentration greater than Method A Cleanup Level.
^a Chapter 173-340 WAC, The Model Toxics Control Act Cleanup Regulations, Method A Cleanup Levels.

MEMORANDUM

TO: Project File
DATE: December 1, 1997
PROJECT: 40936-028.001(5)

FROM: John Virgin

RE: Data Validation Review of Sample Results - SR 519 Preliminary Site Investigation Project, Seattle, Washington

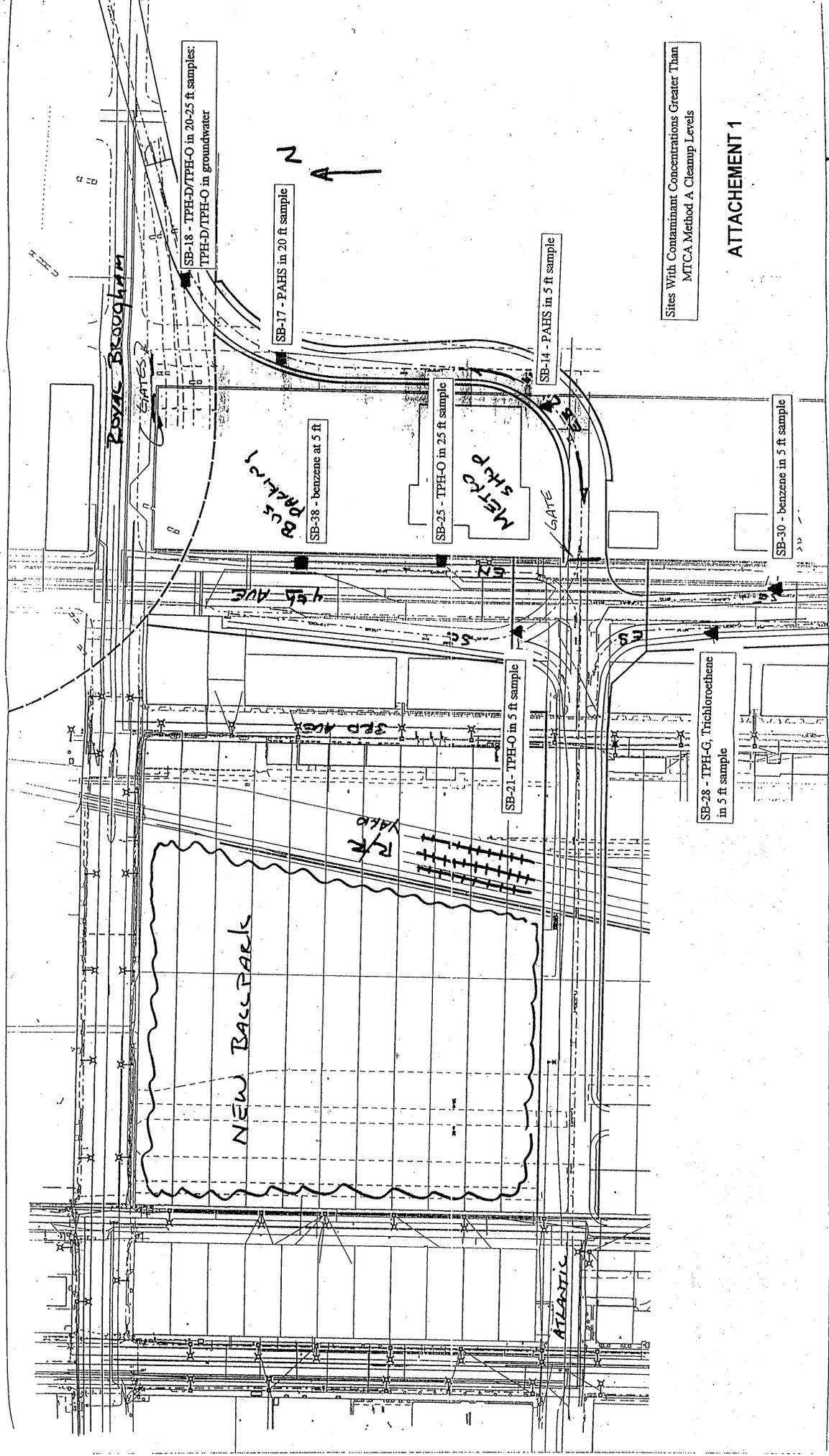
Laboratory results for 79 soil and six water samples collected between August 25 and October 22, 1997, for the SR 519 Preliminary Site Investigation Project were reviewed by Michelle Lange to determine compliance with quality assurance (QA) objectives for data quality. This memorandum summarizes the data validation review. Samples were analyzed by OnSite Environmental, Inc., (OSE) of Redmond, Washington. Sample analyses included total petroleum hydrocarbons (TPH) as gasoline (TPH-G), benzene, toluene, ethylbenzene, and xylenes (BTEX), TPH as diesel and motor oil (TPH-D and TPH-O), metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver), volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons (PAHs), and polychlorinated biphenyls (PCBs). The general procedures outlined in *USEPA Contract Laboratory Program National Functional Guidelines for Inorganics and Organics Data Validation* were followed for the data review. Summaries of the items reviewed are as follows:

- **Holding Times** - all sample holding times were met.
- **Method Blanks** - Methylene chloride was detected in the laboratory method blanks, and also in the samples analyzed for VOCs. All other method blanks were free of contaminants. Based on data validation guidelines, a "B" data qualifier was assigned to all detected results for methylene chloride to indicate potential cross contamination.
- **Surrogates** - surrogate recoveries were generally within method QC criteria except for samples requiring dilutions and samples with matrix interferences. The PAH analysis of sample MW-18-1097 and its associated method blank both showed low surrogate recovery for 2-fluorobiphenyl. However, both of these samples showed acceptable recovery for the other two surrogates. Based on data validation guidelines, no data qualifiers were assigned to the PAH results for sample MW-18-1097. No data qualifiers were assigned to results for other samples with surrogate recoveries that did not meet QC criteria.

SR 519 Hazardous Waste Recommendations

1. On page 3 of the Emcon report, eight boring/pier locations are identified which contained contamination above the conservative cleanup standards in the Model Toxics Control Act (MTCA). These sites are also shown on Attachment 1. Emcon further identifies the type of contaminant and the range of depth the contamination will most likely be found. The primary contaminants identified were petroleum and Polycyclic Aromatic Hydrocarbons (PAH). It appears that any of this material may be disposed of in a permitted landfill or by other treatment option (e.g., thermal treatment, incorporation into asphalt or concrete, etc.). WSDOT retains a RCRA liability for disposal in a landfill. One thermal remediator, TPH Technologies, is permitted to burn a minor level of PAH, but may not accept soil with metals above MTCA standards. The sampling results we obtained do not contain any metals above MTCA limits for these eight locations.
2. Methane gas was encountered in three borings near the intersection of Atlantic Street and 4th Avenue South. Methane is a colorless, odorless, explosive gas. It is a common toxicant in landfills and other locations where organic material is decomposing. The depths at which methane was encountered suggest it may be the result of decomposition of piles of sawdust from early sawmills. An examination of early Seattle maps identified considerable lumber industry in this area. It would be difficult to predict whether methane will be encountered at any one time. However, the contractor working in this general area must be prepared to deal with this toxicant. The primary danger is explosion and secondary inhalation by workers. A spill prevention plan prepared by the contractor should outline actions to be taken if methane is encountered, from immediate response to the explosive risk to protection of the nearby public. The Puget Sound Air Pollution Control Authority (PSAPCA) should be consulted as they may have specific requirements related to venting in certain meteorological conditions.
3. The area around SB-18 at the eastern extreme of the project area, is of special concern, not only to installing piers, but any manner of excavation. The soils contain fairly high concentrations of Petroleum products, volatile organic compounds, and Polycyclic Aromatic Hydrocarbons (PAH). Groundwater was also contaminated with concentrations of these compounds above cleanup standards. There was also free floating product on the water table. A review of other reports and research of land use in this general area suggest this is an area with a much higher than normal expectation of encountering contamination. Construction plans should be carefully reviewed and further sampling conducted if any additional disturbing of soil or groundwater is required. In the WSDOT Discipline Study report for the Kingdome Intermodal Access Project, November 1996, METRO was identified as an acceptable source of disposing of certain contaminated groundwater. Depending on the actual contaminant concentrations in generated groundwater, some pretreatment may be necessary. This extra step could be as simple as passing water through an oil/water separator or a charcoal filter. I would suggest that any pretreatment requirement be deferred until construction but that the contract bid items provide for that planning.

4. Although all borings did not identify contaminants above established cleanup levels, the presence of contaminants is an indicator of possible problems in the immediate area. Recall that our analysis only looked at discrete samples and that contamination could exist close by yet not be identified. Identification of contaminants below cleanup standards can sometimes flag locations where higher concentrations exist in near proximity. Therefore, it is our recommendation that borings sites identified as SB-6, SB-9, SB-10, SB-11, SB-13, SB-32, and SB-36, shown on the Attachment 2, be considered as probable contaminated sites. The construction bid items should provide for visual, olfactory, and field screening tests to be performed on material excavated at these locations and that any suspect material be safely stored at or near the site until a confirmation laboratory analysis of the stockpiled material is performed. Not all material so handled is anticipated to be contaminated. EAO recognizes that this recommendation will result in additional handling of some material, but there is a liability risk for not taking the additional step. A recent experience in Tacoma on the SR509 project resulted in WSDOT having to conduct an after the fact investigation of a pit site location to prove material transported there met MTCA cleanup standards.
5. SB-36 was adjacent to the location of an old gasoline station at 1225 Fourth Avenue South. SB-11 and SB-9 were next to the location of an old gasoline station at 1255 Fourth Avenue South. The contaminants detected at both these locations suggest the presence of gasoline products. Sampling conducted west of these two sites, on Third Avenue South, did not detect any contamination. It appears migration of gasoline contaminants has been limited. However, if WSDOT needs to acquire these properties, further investigation is warranted to define the extent of contamination.
6. By the time you need to prepare contract specifications, the Standard Specifications should have been amended to require Spill Prevention Planning. In this area of Puget Sound, so close to Elliott Bay, proper spill planning is essential and a good business practice. Spill planning is a major part of the curriculum for the Erosion Control Certification. All contractors must now have this certification to bid on a contract in the Puget Sound basin. Our office is the proponent of spill planning and will be able to assist you in evaluating spill planning requirements for this project.



SB-18 - TPH-D/TPH-O in 20-25 ft samples:
TPE-D/TPH-O in groundwater

SB-17 - PAHS in 20 ft sample

SB-38 - benzene at 5 ft

SB-25 - TPH-O in 25 ft sample

SB-14 - PAHS in 5 ft sample

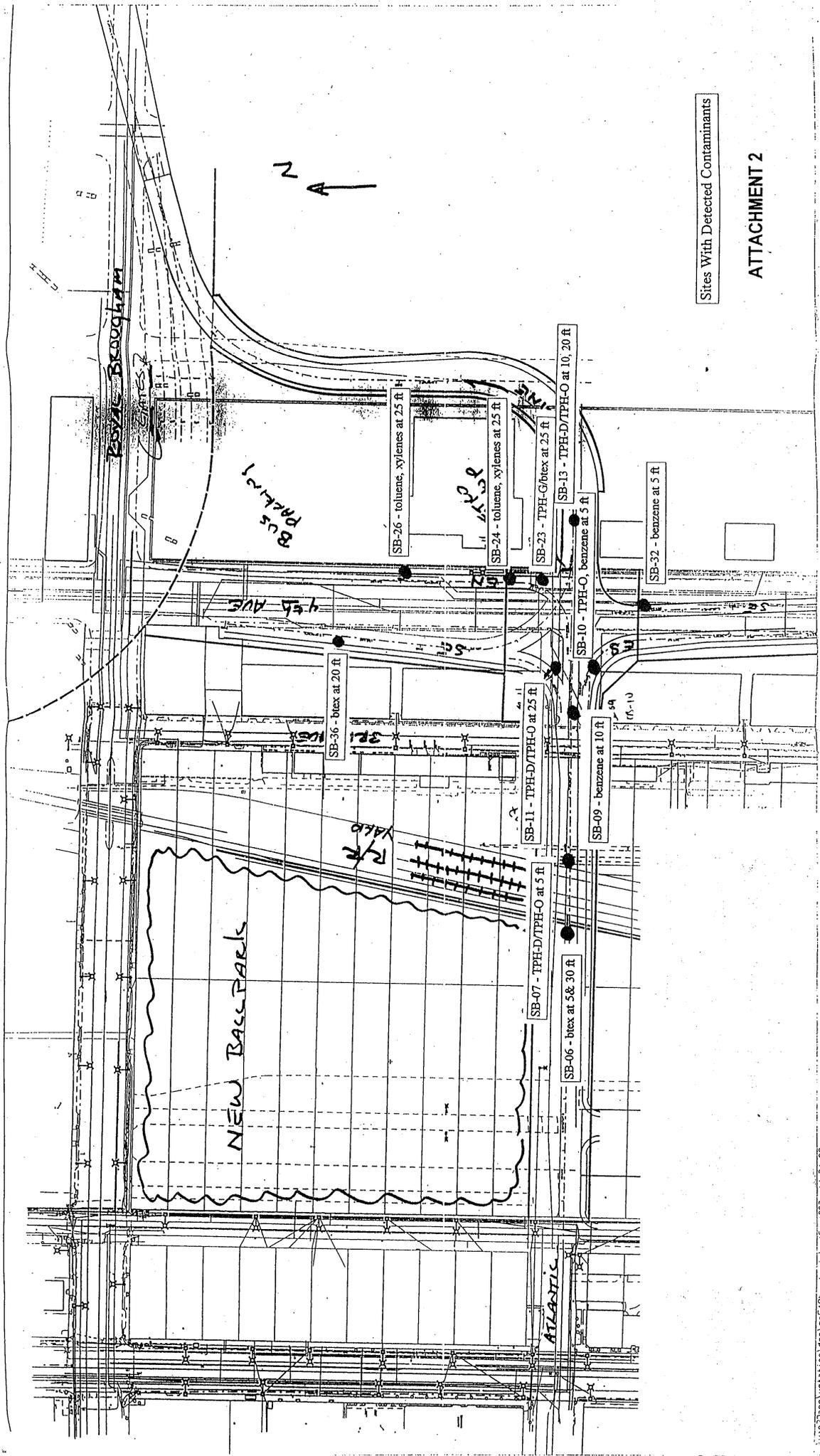
SB-21 - TPH-O in 5 ft sample

SB-28 - TPH-G, Trichloroethene
in 5 ft sample

SB-30 - benzene in 5 ft sample

Sites With Contaminant Concentrations Greater Than
MTCAL Method A Cleanup Levels

ATTACHEMENT 1



Sites With Detected Contaminants

ATTACHMENT 2

Appendix C.
Visual Reconnaissance Photographs



Photo 1. 1064 Fourth Avenue



Photo 2. Qwest Field Parking Garage



Photo 3. North of 1064 Fourth Avenue



Photo 4. 1020 Fourth Avenue



Photo 5. North of 1020 Fourth Avenue



Photo 6. Northwest corner Fourth Avenue and Royal Brougham Way



Photo 7. Southeast corner Fourth Avenue and Royal Brougham



Photo 8. Southeast corner Fourth Avenue and Royal Brougham Way



Photo 9. Looking west on Royal Brougham Way from Fourth Avenue



Photo 10. Safeco Field



Photo 11. North to Qwest Field from Royal Brougham Way

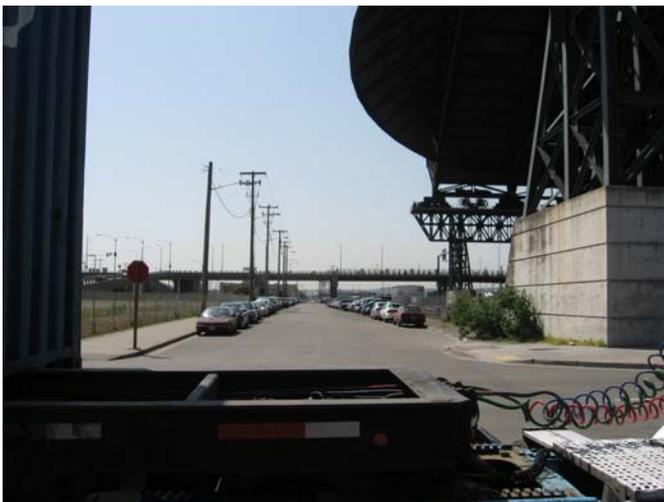


Photo 12. South of Royal Brougham from Fourth Avenue, Safeco Field on right



Photo 13. Railroad tracks west of Fourth Avenue and in back of Safeco Field



Photo 14. Railroad tracks west of Fourth Avenue and Qwest Field



Photo 15. Looking south on Fifth Avenue from Royal Brougham Way



Photo 16. Looking north on Fifth Avenue from Royal Brougham Way



Photo 17. Southwest corner of Sixth and Royal Brougham Way



Photo 18. Southeast corner Sixth and Royal Brougham Way



Photo 19. 1036 Sixth Avenue – Romaine Electric



Photo 20. 1043 Sixth Avenue - Popich



Photo 21. 1039 Sixth Avenue



Photo 22. 1033 Sixth Avenue



Photo 23. 1028 Sixth Avenue



Photo 24. 1031 Sixth Avenue



Photo 25. Pay parking lot east side Sixth Avenue



Photo 26. Pay parking lot east side Sixth Avenue

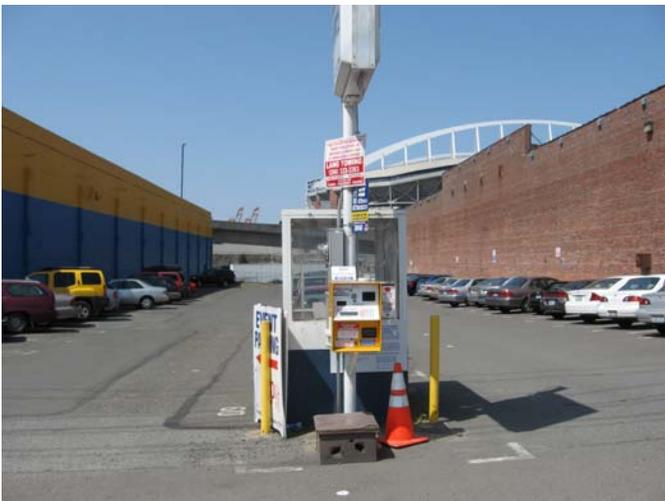


Photo 27. Pay parking lot west side Sixth Avenue



Photo 28. Pay parking lot west side Sixth Avenue

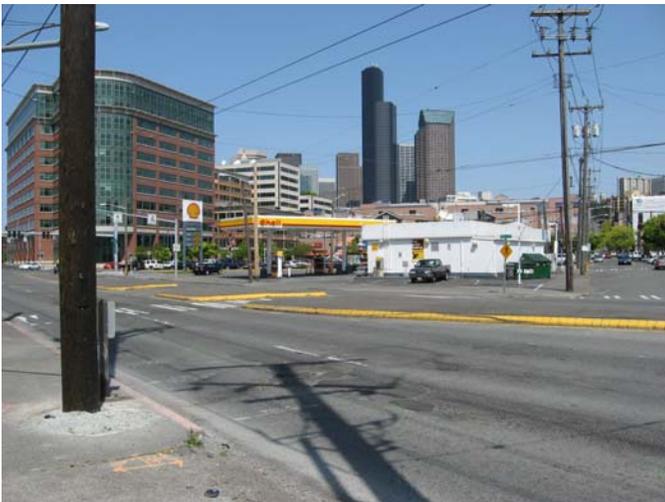


Photo 29 Shell Station, Fifth Avenue and Airport Way



Photo 30 Uwajimaya on Fifth Avenue and Airport Way



Photo 31. Qwest Field



Photo 32. Northeast corner Fourth Avenue and Airport Way



Photo 33. Parking Garage on Fourth Avenue west of Qwest Field



Photo 34. Southeast corner First Avenue and Royal Brougham Way



Photo 35. Northeast corner First Avenue and Royal Brougham Way



Photo 36. 1251 First Avenue, Great Floors 1100 First



Photo 37. 1201 First Avenue, Pyramid (southwest corner First Avenue and Royal Brougham Way)



Photo 38. Northwest corner First Avenue and Royal Brougham Way

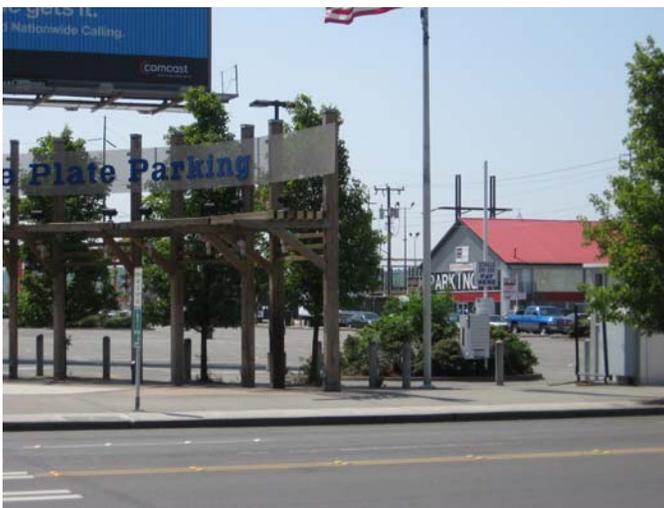


Photo 39. Southwest corner of First Avenue and South Atlantic Street



Photo 40. Northeast corner of First Avenue and South Atlantic Street



Photo 41. Southeast corner of First Avenue and South Atlantic Street



Photo 42. Looking east to South Atlantic Street



Photo 43. 85 South Atlantic Street



Photo 44. North of First Avenue opposite 85 South Atlantic Street



Photo 45. Sound Produce south of 85 South Atlantic Street



Photo 46. Pay parking lot south of Sound Produce



Photo 47. 1531 Utah Street



Photo 48. Mass. Street Substation



Photo 49. 1701 South First Avenue, Wine Outlet



Photo 50. 1700 South First Avenue, Fenix Industries



Photo 51. 1560 South First Avenue Barcodes West



Photo 52. Northwest corner of First Avenue and Mass. Street.



Photo 53. 1548 South First Avenue, Canine Club



Photo 54. 1534 First Avenue, Queen Anne Window Door



Photo 55. 1530 First Avenue, vacant building



Photo 56. 1526 First Avenue, Emerald Market Supply



Photo 57. 1518 First Avenue, Bogart Golf



Photo 58. Television trailers east of Safeco Field Parking Garage and south of Safeco Field



Photo 59. Railroad on south side of South Atlantic Street



Photo 60. Railroad on north side South Atlantic Street



Photo 61. Third Avenue north of South Atlantic Street behind Safeco Field



Photo 62. Looking west on South Atlantic Street



Photo 63. Third Avenue, Outdoor Emporium



Photo 64. 1555 Fourth Avenue, Filson



Photo 65. North of Filson, WSDOT (Third Avenue)



Photo 66. North of WSDOT (Third Avenue)

Appendix D.
Potential Regulatory Concerns

Appendix D

Potential Regulatory Concerns

Numerous federal, state, and local regulations and policies govern planning and decisionmaking concerning hazardous waste and liability issues. The following explanations of regulations are not all-inclusive. Further evaluation of the regulations that would affect the proposed project construction should take place during the final design stage.

Model Toxics Control Act (MTCA) Regulations (WAC 173-340)

The Model Toxics Control Act Cleanup Regulation, Chapter 173-340 of the, Washington Administrative Code (WAC), is the Washington State implementation of the MTCA, Chapter 70.105D, Revised Code of Washington (RCW). Several administrative rules in this regulation include strict requirements for site discovery, reporting, and site assessments. The regulation defines the standard methods used to assess whether a site is contaminated or clean.

The MTCA will apply to any site identified with environmental contamination that may pose a threat to human health and/or the environment during this project. MTCA establishes the acceptable cleanup limits for contaminated media. Any necessary cleanup would likely be accomplished during construction as an independent action by WSF, with technical review by the Department of Ecology on an as-needed basis. Washington Administrative Code (WAC) 173-340-450 sets forth the requirements for addressing releases that may pose a threat to human health or the environment from underground storage tanks USTs. An overview of the cleanup standards is detailed in WAC 173-340-700. Groundwater and soil cleanup standards are listed in WAC 173-340-720 and WAC 173-340-740, respectively.

All Appropriate Inquiry (40 CFR 132)

The federal standards and practices for conducting all appropriate inquiries (AAI) were published on November 1, 2005 and will be effective on November 1, 2006. The rule

establishes specific regulatory requirements and standards for conducting all appropriate inquiries into the previous ownership and uses of a property for the purposes of meeting the AAI provisions necessary to qualify for certain landowner liability protections under CERCLA.

Sediment Management Standards (SMS) (WAC 173-204)

WAC 173-204 implements marine sediment quality and cleanup standards similar to MTCA. This regulation imposes a number of unique requirements that could impact this project. Source control standards apply for actions that re-suspend surface sediments or cause surface sediments to exceed applicable standards.

Solid Waste Regulations (WAC 173-304)

WAC 173-304 implements the Solid Waste Management Act (RCW 70.95) and establishes the Minimum Functional Standards for Solid Waste Management. Solid waste facilities, including landfills, transfer stations, and woodwaste sites, are permitted and monitored to ensure proper handling of wastes to prevent environmental contamination. Solid waste generated by the Proposed Action could include soil contaminated at concentrations below dangerous waste, creosote-treated timber, and construction debris in addition to typical municipal waste. These waste types can be disposed of as solid waste at an appropriately permitted facility.

Water Quality Standards for Surface Water

Pollution of state waters is controlled by two administrative regulations that implement Chapter 90.48 RCW, Water Pollution Control Act: Chapter 173-201A, WAC Water Quality Standards for Surface Waters of the State of Washington, and Chapter 173-200, WAC Water Quality Standards for Groundwater of the State of Washington.

Chapter 173-201 WAC indicates that toxic substances, above natural background levels, will not be introduced into waters of the state if the substance will (1) singularly or cumulatively adversely affect characteristic water uses, (2) cause acute or chronic toxicity to the most sensitive biota dependent on the water, or (3) adversely affect public health. The Department of

Ecology would employ or require chemical toxicity testing and biological assessments as appropriate to determine compliance with the above-mentioned requirements. WAC 173-201A-160 lists the primary means for controlling municipal, commercial, and industrial waste discharges through the issuance of waste disposal permits.

Wastewater Discharges to Ground (WAC 173-216).

The State Water Discharge Permit program includes a variety of exemptions, most of which relate to discharges that are permitted under an National Pollution Discharge Elimination System (NPDES) permit or are otherwise authorized by a publicly owned treatment works (POTW) with an authorized pretreatment program. This regulation may apply to stormwater detention facility planned for the project if the water were to contain unacceptable concentrations of polluting materials.

State Dangerous Waste Regulations (WAC 173-303)

Waste designation procedures are the most likely portion of this regulation that could affect the project. Any contaminated materials generated during the construction project, including soil, water, and debris, would have to be properly designated prior to disposal. In addition, wastes generated by the contractor during construction would require proper designation prior to disposal. WAC 173-303-070 through 173-303-110 includes the specific regulations that identify dangerous waste characteristics and criteria. The requirements for generators of dangerous waste are included in WAC 173-303-170 through WAC 173-303-230. A transporter of dangerous waste must comply with the procedures listed in WAC 173-303-240 through 173-303-250.

WAC 173-303-145 lists the reporting requirements for spills and discharges into the environment, except when otherwise permitted under state or federal law. This section of the WAC applies “when any dangerous waste or hazardous substance is intentionally or accidentally spilled or discharged into the environment such that human health or the environment is threatened, regardless of the quantity of dangerous waste or hazardous substance.” This portion of the regulation also

details the required procedures for notification and mitigation should if a spill were to occur on site.

Washington State Department of Labor and Industries Regulations

Occupational safety and health standards are found in the comprehensive Chapter 296-62, WAC, Occupational Health Standards, which is managed by the Washington State Department of Labor and Industries (L&I). These general safety requirements apply to all construction activities. They include operations at known hazardous sites and initial investigations conducted at sites before the presence or absence of hazardous substances has been ascertained. In addition to the safety standards mentioned above, WAC 296-155 requires employers to inform their workers of the potentially hazardous conditions of the workplace. The employer is required to train the workers to recognize hazardous conditions in the workplace and train them how to respond to and report such conditions.

Underground Storage Tank Statute & Regulations (RCW 90-76, WAC 173-360)

The purpose of the RCW 90-76 and WAC 173-360 regulations is to address the serious threat posed to human health and the environment by leaking underground storage tank systems (LUSTs) containing petroleum and other regulated substances. The regulations describe the enforcement, notification, and reporting requirements for underground storage tanks. The regulations also detail the performance standards and operating and closure requirements for USTs.

Underground Utilities (RCW 19.122)

There are multiple operating utilities that are present within the project areas. Revised Code of Washington (RCW) 19.122 states that an excavator will provide notice of the scheduled commencement of excavation to all owners of underground facilities through a one-number locator service. The RCW also states that all owners of underground facilities within a one-number locator service will subscribe to the service. Notice needs to be communicated to the locator service no less than 2 days and no more than 10 days prior to the commencement of excavation activities. If the excavator discovers utilities that

were not identified or damages a utility, the excavator will stop work and notify the locator service and the owner of the utility service if possible. If the damage causes an emergency situation, the excavator will also alert the appropriate public health agencies and take all steps necessary to ensure public safety. A failure to notify the locator service of damage to a hazardous liquid or gas pipeline is subject to a civil penalty of not more than \$10,000 for each violation. Any excavator who willfully or maliciously damages a field-marked underground facility will be liable for triple the costs incurred in repairing or relocating the facility.

SR519 INTERMODAL ACCESS PROJECT PHASE 2: SOUTH ATLANTIC CORRIDOR

Hazardous Materials Discipline Report

Prepared for



Prepared by

CH2MHILL

February 2008

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- Exhibit 2-2. Project Elements
- Exhibit 2-3. Existing and Proposed Westbound Travel Routes
- Exhibit 3-1. Environmental Regulatory Agency Databases Used
- Exhibit 3-2. Summary of Regulatory Agency Lists Reviewed
- Exhibit 4-1. Sites of Concern Listed on Regulatory Agency Databases
- Exhibit 4-2. Locations of Sites of Concern Listed on Regulatory Agency Databases near the SR 519 Atlantic Access Corridor
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- Exhibit 4-5. Sanborn Map Information
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- Exhibit 6-1. Reasonably Foreseeable Future Actions
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- A. EDR Records Review
- B. Excerpts From Project-Related WSDOT Reports
- C. Visual Reconnaissance Photographs
- D. Potential Regulatory Concerns

Acronyms and Abbreviations

B

BTEX	benzene, toluene, ethylbenzene, and xylene
BMPs	best management practices

C

CSCSL	Washington State Confirmed and Suspected Contaminated Sites List
CERCLA	Comprehensive Environmental Response, compensation, and Liability Act, 42 USC Section 9601
CERCLIS	CERCLA Inventory Superfund Site/Event Listing
CERC-NFRAP	sites removed and archived from the inventory of CERCLIS sites
CFR	Code of Federal Regulations
CORRACTS	RCRA Corrective Action Activity Listing

E

Ecology	Washington State Department of Ecology
EDR	Environmental Data Resources, Inc.

F

FINDS	Facility Index System
FTTS	Federal Insecticide, Fungicide, & Rodenticide Act (FIFRA)/Toxic Substances Control Act (TSCA) Tracking System

H

HSL	Washington State Hazardous Sites List
-----	---------------------------------------

I

ICR	Independent Cleanup Reports List (Washington State)
IRAP	Independent Remedial Action Plan

L

LQG	large quantity generator (of hazardous waste)
LUST	leaking underground storage tank

M

Manifest	Hazardous waste manifest information
MQG	medium quantity generator (of hazardous waste)
MTCA	Model Toxics Control Act

N

NEPA	National Environmental Policy Act
NFA	No Further Action
NPL	National Priority List (federal Superfund list)

P

PADS	PCB Activity Database System
PAHs	polynuclear aromatic hydrocarbons
PCBs	polychlorinated biphenyls

R

RA	Remedial Action
RAATS	RCRA Administrative Action Tracking System
RCRA	Resource Conservation and Recovery Act, 42 USC Section 6901-9651
RCRIS	RCRA Information System
RCRIS/CORRACTS	RCRIS - Storage and Disposal Facilities Lists/RCRA Corrective Action Reports
RCRIS – TSD	RCRIS – Treatment, Storage, or Disposal Facilities
RCW	Revised Code of Washington
RFI	RCRA Facility Investigation

S

SBLRBRA	Small Business Liability Relief and Brownfields Revitalization Act
SEPA	State Environmental Policy Act
SPCC	spill prevention, control, and countermeasures (plan)
SPILLS	Reported Spills
SQG	small quantity generator (of hazardous waste)
SR	State Route
SWPPP	stormwater pollution prevention plan

T

TCLP	toxicity characteristic leaching procedure (test)
TPHs	total petroleum hydrocarbons
TSD	treatment, storage, and disposal
TSDF	treatment, storage, and disposal facility

U

UST underground storage tank

V

VCP Voluntary Cleanup Program (Ecology)

W

WAC Washington Administrative Code

WSDOT Washington State Department of Transportation

Glossary of Technical Terms

Contaminated soil – Soil that contains hazardous substances which do not occur naturally or which occur at greater than natural background levels.

Dangerous waste – In Washington State, dangerous wastes include federally-regulated hazardous wastes (40 CFR 261 Subparts C and D, as adopted in WAC 173-303-080 and -090) and other wastes that are considered dangerous or hazardous under Washington State regulations (WAC 173-303-100). The term “dangerous waste” includes both types of waste.

Hazardous material – A generic term for any medium that contains organic or inorganic constituents considered toxic to humans or the environment. This term covers dangerous waste, problem waste, solid waste, and hazardous substances.

Hazardous substance – Hazardous substances designated in 40 CFR 116 pursuant to Section 311 of the Clean Water Act include any materials that pose a threat to public health or the environment. Typical hazardous substances have one or more of the following characteristics: toxicity, corrosivity, ignitability, explosivity, or chemical reactivity. Federal regulation of hazardous substances excludes petroleum, crude oil, natural gas, natural gas liquids, or synthetic gas usable for fuel. Washington State regulation of hazardous substances includes petroleum products, which are addressed by the Model Toxics Control Act (MTCA).

Hazardous waste – Solid wastes designated in 40 CFR Part 261 and regulated as hazardous and/or mixed waste by the U.S. Environmental Protection Agency. Mixed waste includes both hazardous and radioactive components; waste that is solely radioactive is not regulated as hazardous waste. Hazardous

waste includes specific listed waste that is generated from particular processes or activities or exhibits certain reactive, corrosive, toxic, or ignitable characteristics. Hazardous waste is also regulated by the Washington State Department of Ecology (Ecology) as Dangerous Waste.

Large quantity generator - A large quantity generator (LQG) generates 2,200 pounds or more of dangerous waste, or 2.2 pounds or more of extremely hazardous wastes each month. Large quantity generators can accumulate more than 2,200 pounds of dangerous waste, or more than 2.2 pounds of extremely hazardous wastes, at their site before sending the waste offsite for proper disposal or recycling. Large quantity generators are subject to more stringent management and reporting requirements than small quantity generators as set forth in federal and state regulations (WAC 173-303).

Medium quantity generator - A medium quantity generator (MQG) in Washington State generates between 220 pounds and 2,200 pounds of dangerous waste or up to 2.2 pounds of extremely hazardous waste each month. Medium quantity generators can accumulate up to 2,200 pounds of dangerous waste, or 2.2 pounds of extremely hazardous wastes, at their property before sending the waste offsite for proper disposal or recycling. Medium quantity generators are exempt from most regulations if they stay within the generation and accumulation limits described above (WAC 173-303-201 and -202). Under the federal regulations (and in the databases from Environmental Data Resources, Inc.), a hazardous waste generator this size is known as a small quantity generator (SQG).

Problem waste – Pursuant to WAC 173-350 (as amended in March 2005), problem wastes are defined as soil, sediment, sludge, and liquids (groundwater, surface water, decontamination water, etc.) that are removed during the cleanup of a remedial action site, a dangerous waste site closure, or other cleanup efforts and actions that contain hazardous substances but are not designated as dangerous waste pursuant to WAC 173-303. Examples of the type of

waste streams that could be disposed under this definition include:

- Contaminated soil, sludge, groundwater, surface water, and construction demolition debris containing any combination of the following compounds: petroleum hydrocarbons, volatile and semi-volatile organic compounds, polynuclear aromatic hydrocarbons, polychlorinated biphenyls, heavy metals, herbicides, and/or pesticides
- Contaminated dredge material (sediments) resulting from the dredging of surface waters of the state where contaminants are present in the dredge spoils at concentrations not suitable for open water disposal and the dredge spoils are not dangerous wastes and are not regulated by Section 404 of the Clean Water Act
- Materials containing asbestos

Reasonably predictable property - Properties where the nature of the potential contamination is known based on existing investigation data or where it can be reasonably predicted based on best professional judgment.

Small quantity generator - A small quantity generator (SQG) in Washington can generate up to 220 pounds of dangerous waste, or up to 2.2 pounds of extremely hazardous wastes each month or per batch. Small quantity generators can accumulate up to 2,200 pounds of dangerous waste, or 2.2 pounds of extremely hazardous wastes, at their property before sending the waste offsite for proper disposal or recycling. Small quantity generators are exempt from most regulations if they stay within the generation and accumulation limits described above.

Solid waste – State regulations define solid waste as all putrescible and nonputrescible solid and semisolid wastes including, but not limited to, garbage, rubbish, ashes, industrial wastes, swill, sewage sludge, demolition and construction wastes, abandoned vehicles or parts thereof, problem wastes as defined above, and recyclable materials. Federal regulations define solid waste as any garbage, refuse, sludge from a

wastewater treatment plant, water supply treatment plant, or air pollution control facility, and other discarded material, including solid, liquid, semisolid, or contained gaseous material, resulting from industrial, commercial, mining, and agricultural operations and from community activities. Solid waste includes hazardous and problem wastes.

Summary

What is the proposed project and why is it needed?

The Washington State Department of Transportation (WSDOT) proposes to construct improvements to State Route (SR) 519 in Seattle as Phase 2 of the SR 519 Intermodal Access Project.

The project would include three components:

- A proposed new Interstate 90 (I-90) off-ramp to South Atlantic Street (I-90 off-ramp)
- A proposed new South Royal Brougham Way railroad overpass (BNSF Railway overpass)
- Roadway widening along the existing South Atlantic Street east of First Avenue South and improvements to the intersection of First Avenue South and South Atlantic Street

SR 519 is an important thoroughfare for cars, trucks, and pedestrians in Seattle's South of Downtown (SODO) district. In 2004, WSDOT opened Phase 1 of the SR 519 project, consisting of the South Atlantic Street overpass (Edgar Martinez Drive) and a new on-ramp from South Atlantic Street to I-5 and I-90. The Proposed Action (SR 519 Intermodal Access Project – Phase 2: South Atlantic Corridor) would complete the SR 519 project by providing a direct westbound connection from the I-5/I-90 freeway system to the Seattle waterfront and Port of Seattle. Currently, westbound traffic from the freeway exits at Fourth Avenue South and follows a circuitous route to South Atlantic Street to cross safely over the BNSF Railway tracks located just east of Safeco Field and Qwest Field. Vehicular and pedestrian traffic on South Royal Brougham Way must use an at-grade railroad crossing. New roadway structures are needed to allow vehicles and pedestrians to reach their destinations safely, quickly, and directly.

The Proposed Action would connect the existing westbound off-ramp from I-5 and I-90 to the current South Atlantic Street overpass, and it would construct improvements at the intersection of First Avenue South and South Atlantic Street and widen South Atlantic Street to accommodate traffic along this new route. A grade-separated crossing over the railroad tracks at South Royal Brougham Way would also be built.

This project would increase traffic mobility and safety by improving connections between Interstates 5 and 90 and Port of Seattle terminals, the Washington State Ferries terminal at Colman Dock, waterfront commercial interests, and the stadium area. The project would also allow people to walk more safely to and from the stadium area.

What is the affected environment?

The SR 519 Atlantic Access Corridor was historically an industrial area south of downtown Seattle. The slow transition from industrial businesses to more commercial and sports-oriented businesses began in the late 1970s when the Seattle Kingdome was built. In the past 10 years, there has been continuing renovation as Safeco Field was built in 1998, the Kingdome was demolished in 2000, and Qwest Field and the Qwest Field Event Center were built in 2002. In 2004, the first phase of the SR 519 project was constructed, consisting of an on-ramp to I-90 from South Atlantic Street (Edgar Martinez Drive).

For the purposes of this report, the hazardous materials study area is defined as within and up to a 1-mile radius from the intersection of Fourth Avenue South and South Royal Brougham Way and encompasses the intersection of First Avenue South and South Atlantic Street. Sites located within this study area were evaluated for their potential to affect or be affected by the Proposed Action.

Twenty-four sites were identified in this report as sites of concern. In general, the sites of concern are sites that have had substantial contamination that could affect or be affected by project activities. In addition, although not connected with a

specific location, the extensive railroad infrastructure within the study area, both historical and current, is listed as a site of concern. Forty-three other sites located within the study area were also evaluated but were not considered to be sites of concern. Finally, during construction of Phase 1 of the SR 519 project, soil and groundwater contamination was encountered.

Three sites warrant further investigation because they fall directly within the project construction area and there is a high potential for encountering contaminated media. These three sites are:

- King County Metro Transit Station – Ryerson Base (1213-1220 Fourth Avenue South)
- The west and east sides of the railroad lines, including a small parcel of land to be acquired that is located west of Third Avenue South, north of South Royal Brougham Way, and north of South Atlantic Street
- The southeast side of the intersection of First Avenue South and South Atlantic Street

What methods were used to evaluate potential effects of the Proposed Action and the No Build Alternative?

The following activities were conducted for this hazardous materials discipline report.

- Identified the range of potential contamination for properties within the project limits through a review of regulatory agency database lists and supplemental historical research.
- Evaluated all properties for hazardous materials based on their location relative to the project study area and considered additional site-specific environmental data available in regulatory agency files and previous studies.
- Summarized environmental conditions at the known or suspected contaminated properties within the project study area.

- Evaluated potential effects that known or suspected contamination could have on project development, including property acquisition and construction activities.
- Identified mitigation measures to avoid or control contaminated site effects on the project.

What possible hazardous materials effects would occur during construction of the project, and what mitigation is proposed?

Construction activities for the SR 519 South Atlantic Access Corridor project would result in several types of effects related to hazardous materials. The effects and recommended mitigation measures are as follows:

- Contaminated soil and groundwater is likely to be encountered and removed during construction. The construction contractor would be required to have a soil construction contingency plan, a stormwater pollution prevention plan (SWPPP), and a spill prevention, control, and countermeasures (SPCC) plan, and to be familiar with the Washington State Department of Ecology's *Guidance for Remediation of Petroleum Contaminated Soils* (Washington State Department of Ecology [Ecology], 1995). These documents would help to identify procedures, chains of responsibility, and concentration levels requiring cleanup in the event that contaminated soil is encountered. The development of the SWPPP would assist in the handling of contaminated water. It addresses the procedures, equipment, and materials necessary to avoid erosion during excavation or soil stockpiling. It also addresses the diversion of stormwater, surface water, or groundwater that seeps into an excavation.
- Air quality could be affected by release of contaminants and dust during construction and handling of contaminated media, resulting in worker and public exposure. The use of personal protective equipment, contingency planning, and secondary containment for hazardous material would be

required for contractors. Public access to the project construction zone would be restricted.

- Accidental releases of hazardous substances (i.e., fuel and lubricants) during construction are a hazard common to all construction projects. The development of a SWPPP, an SPCC plan, and the implementation of best management practices for runoff from the construction site would be required.
- Regulations require that individuals involved with excavation be trained in the recognition and reporting procedures for discovery of unknown contamination and to have HAZWOPER training, according to CFR 1910.120, for individuals expected to be working around hazardous materials.

Limited amounts of excavation required for project construction would create relatively small quantities of contaminated soil. There are several possible mitigation measures for managing contaminated soils during construction. The preferred mitigation option is to avoid the contaminated property. However, this option is not possible due to fixed alignments of the SR 519 Atlantic Access Corridor and the existing structures around the study area.

Other mitigation measures include cleaning up the affected properties according to accepted Ecology guidelines and industry standards. This includes excavation and remediation of the contaminated soil onsite and disposing of it onsite, or transporting it offsite for treatment and disposal.

Groundwater elevations in the study area are generally 3 to 6 feet below the ground surface. The deepest construction required for the project would be for the bridge foundations for the South Atlantic Street ramp and the Royal Brougham Way railroad overpass. Since the excavations for the foundations would extend below the groundwater table into the deeper glacial till, it is likely that groundwater would be encountered during construction and that the groundwater would be contaminated.

Mitigation options for managing contaminated groundwater include:

- Collecting contaminated groundwater
- Pretreatment prior to disposal
- Onsite treatment prior to discharge
- Offsite treatment and disposal
- Installing casing to isolate groundwater during construction of the bridge foundations and during operation.

WSDOT would have to acquire several small parcels of land totaling approximately 5,415 square feet from several different landowners, including King County, Seattle Department of Transportation, and the Major League Stadium Public Facilities, for the construction activities related to the SR 519 South Atlantic Access Corridor project. The terms of the various acquisitions have not been finalized. If any of these properties were contaminated (and it is likely that they would be), WSDOT could become liable for site cleanup. RCW 70-105D.040 identifies persons liable for facility/property remediation as the current or past property owner/operator. In situations where there is more than one liable party, each party is jointly and severally liable for costs associated with cleanup of a site and costs to repair damages to natural resources.

In order to minimize long-term liability associated with the planned acquisitions required for construction, it is recommended that WSDOT enter into discussions with the current landowners regarding the scope and extent of any ongoing investigations and known contamination. By engaging interested parties early in the process, WSDOT would have the opportunity to verify that the remedial investigation and subsequent remedial cleanup actions, if any, were conducted in a manner that would minimize WSDOT's long-term liability associated with the acquisition of the property.

WSDOT must also perform "all appropriate inquiry" as required under Section 101(35)(B)(ii) and (iii) of CERCLA prior to obtaining the property. This inquiry could be part of the

recommended further site investigation. If the inquiry identifies soil and/or groundwater contamination that has not already been remediated by the current land owner under the voluntary cleanup program, WSDOT might negotiate a price for the property that is reduced by an amount equal to the estimated cost of cleaning up the contamination.

What potential hazardous materials effects would occur during operation of the project, and what mitigation is proposed?

After construction is complete and the SR 519 South Atlantic Corridor becomes operational, the potential for hazardous material effects would be dramatically reduced because of improved traffic flow to I-5 and I-90 from the Port of Seattle, which would reduce the likelihood for vehicular collisions and hazardous materials spills. No mitigation measures would be required for these operational effects.

Are any of the identified effects considered substantial?

Yes, the effects would be substantial. It is likely that contamination would be found during construction, construction would be affected, and the use of specially trained construction staff and special management of contaminated soils would be required.

In past years, releases from sites adjacent to and near the proposed project site have resulted in contaminated soil and groundwater. During construction of the Phase 1 SR 519 project, soil and groundwater contamination was found.

The adverse effects of these contaminated properties can be dramatically reduced using the mitigation measures described and thereby reduce the contamination to below substantial thresholds; however they cannot be eliminated completely.

What environmental effects associated with hazardous materials would occur if the project is not built?

There would be no direct environmental effects associated with the No Build Alternative. However, the removal or cleanup of potentially hazardous materials encountered during project construction, including contaminated soil or groundwater, would not occur under the No Build Alternative, and the potential for uncontrolled migration of existing contaminants would continue. Contaminated soils could continue to act as a secondary source of contamination and continue to leach into the underlying groundwater. Since the general groundwater flow is to the west, the contaminated groundwater might eventually enter Puget Sound. The amount of remediation associated with the project would be relatively minor because of the small footprint associated with construction, as compared with the surrounding industrial district within which the project is located, which has a long history of contamination. Under the No Build Alternative, increasing traffic congestion on SR 519 in the reasonably foreseeable future would indirectly affect hazardous materials by increasing the potential for collisions and hazardous material spills that could enter the environment.

Chapter 1 Introduction

1 Why are hazardous materials considered in this report?

The purpose of this study is to identify and assess the potential for encountering hazardous materials that could increase construction costs, endanger worker safety, and represent an environmental liability for Washington State Department of Transportation (WSDOT).

The goals for this report are to:

- Identify historical and existing property uses that have a known or probable presence of contamination.
- Identify adjacent property uses (current or historical) that could affect water quality within the project construction zone (e.g., migration of contaminated groundwater or surface water).
- Identify the locations of sites that warrant additional investigation to further characterize the potential effects of hazardous materials.
- Provide information on how the project would avoid or minimize potential effects of hazardous materials.

By reviewing information on potentially contaminated sites, hazardous materials can be handled in compliance with the federal and state laws listed below.

Federal Regulations:

- Clean Air Act (CAA), 42 USC 7401 et seq.
- Clean Water Act (CWA), 33 USC 1251 et seq.
- Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 USC 9601 et seq.
- Endangered Species Act, 7 USC 134, 16 USC 460 et seq.

- Federal Highway Administration, Technical Advisory T6640.8A (1987), Supplementary Hazardous Waste Guidance (1997), and Hazardous Wastes in Highway Rights-of-Way (1994)
- Occupational Safety and Health Act, 29 USC 651 et seq.
- Resource Conservation and Recovery Act (RCRA), 42 USC 321 et seq.
- Safe Drinking Water Act, 42 USC 300(f) et seq.
- Small Business Liability Relief and Brownfields Revitalization Act
- Toxic Substances Control Act (TSCA), 15 USC 2601 et seq.

Washington State Regulations

- Clean Air Act, Chapter 70.94 RCW
- Hazardous Waste Management Act, Chapter 70.105 RCW
- Model Toxics Control Act (MTCA), Chapter 70.105D RCW
- Occupation Health Standards, WAC 296-62
- Solid Waste Management Act, Chapter 70.95 RCW
- Underground Storage Tanks (USTs), Chapter 90.76 RCW
- Water Pollution Control Act, Chapter 90.48 RCW

2 What are the key points of this report?

The principal effects of the Proposed Action are primarily related to construction activities for the SR 519 South Atlantic Access Corridor, including the possibility of encountering USTs, accidental releases of hazardous substances during construction, and construction worker and public exposure to hazardous materials that might be uncovered, released, or spilled during construction.

Hazardous materials are likely to be present in the study area because of historical activities. During construction of Phase 1

of the SR 519 project, extensive soil and groundwater contamination was found. In addition, there are long-established railroad rights-of-way where contaminants might occur, known releases at King County Metro Transit's Ryerson Base and other facilities, and known releases on the southwest corner of First Avenue South and South Atlantic Street. Consequently, contaminated soil and groundwater are likely to be encountered during construction.

The operational effects of the project include the potential for hazardous material spills from transport trucks.

Chapter 2 Description of Alternatives

SR 519 is an important thoroughfare for cars, trucks, and pedestrians in Seattle's South Downtown (SODO) district (Exhibit 2-1). In 2004, WSDOT opened Phase 1 of the SR 519 project, consisting of the South Atlantic Street railroad overpass (Edgar Martinez Drive South) and a new eastbound on-ramp from South Atlantic Street to I-5 and I-90. The overpass separates road and railway traffic at Third and Fourth Avenues South and improves access to the freeway system from important waterfront facilities such as the Port of Seattle terminals, railroad freight yards, and the Washington State Ferries terminal at Colman Dock.

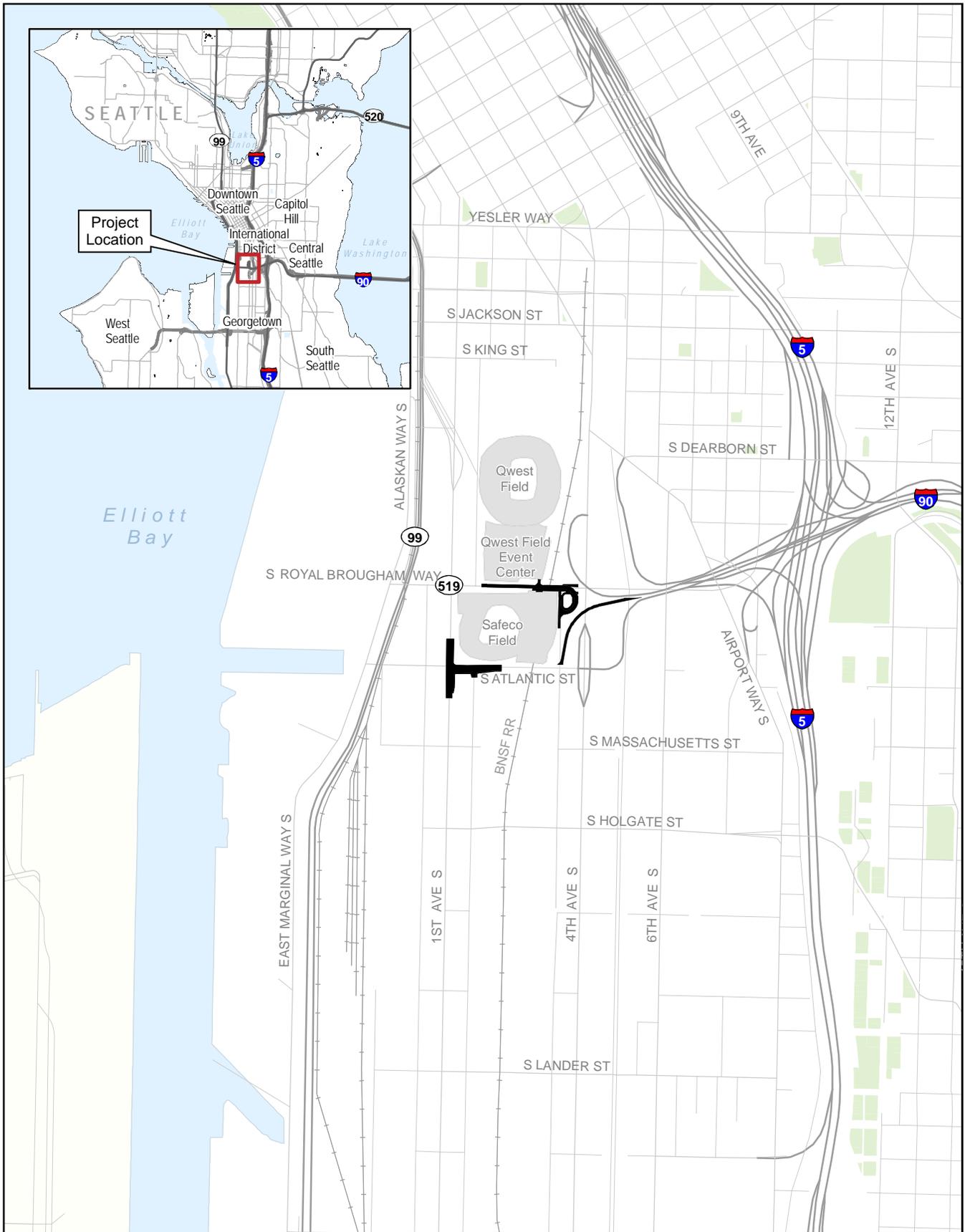


New South Atlantic Street overpass built in SR 519 Phase 1

The Phase 1 project had four main components which:

- Provided the eastbound connection from the waterfront to I-5 and I-90 via South Atlantic Street
- Removed the old eastbound I-90 ramp on Fourth Avenue South
- Made improvements to South Atlantic Street between First Avenue South and the Alaskan Way South/East Marginal Way intersection
- Constructed the South Weller Street Pedestrian Bridge

When Phase 1 opened, eastbound freight, ferry, and event traffic immediately moved more freely, because connections from the Port of Seattle, waterfront, and stadium area to the freeway system were improved.



Source: City of Seattle (2007) and King County (2006)

- Stadiums
- Project



**Exhibit 2-1
Vicinity Map**

1 Why is the Phase 2 project needed?

SR 519 provides a vital roadway system for east-west traffic through Seattle, but it currently does not assist in the efficient westbound movement of cars, trucks, trains, and pedestrians through Seattle's SODO district. The route passes through an area that has changed so much in recent years that the roadway arrangement is not well suited to present conditions. A new design and new roadway structures are needed to allow vehicles and pedestrians to reach their destinations safely, quickly, and more directly.

This project would help to resolve several issues:

- Safety concerns from traffic and people crossing surface-level railroad tracks in the stadium area
- The expected increase in rail traffic and pedestrian crossings at South Royal Brougham Way when Sound Transit Central Link light rail service begins in 2009, resulting in safety concerns and travel delays
- Poor westbound access between I-5/I-90 and the Seattle waterfront, especially the Port of Seattle terminals and the Washington State Ferries terminal at Colman Dock
- Delays in moving products between Port of Seattle terminals and local, regional, and national markets

2 What is the purpose of the project?

This project would improve traffic mobility and safety by improving westbound connections between I-5/I-90 and the Port of Seattle terminals, the Washington State Ferries terminal at Colman Dock, waterfront commercial interests, and the stadium area. The project would allow people to walk more safely to and from the stadium area.

The purpose of the project is to:

- Provide a more direct route between I-5/I-90 and the Seattle waterfront, so that westbound freight, commuters, and local traffic can move more safely and efficiently through the stadium area

- Improve safety and reduce railroad and vehicle delays at the surface-level rail crossing on South Royal Brougham Way west of Fourth Avenue South
- Improve safety for people walking to events, work, and neighborhood destinations
- Reduce truck and rail traffic conflicts so that freight operators can move products more efficiently between Port of Seattle terminals and markets

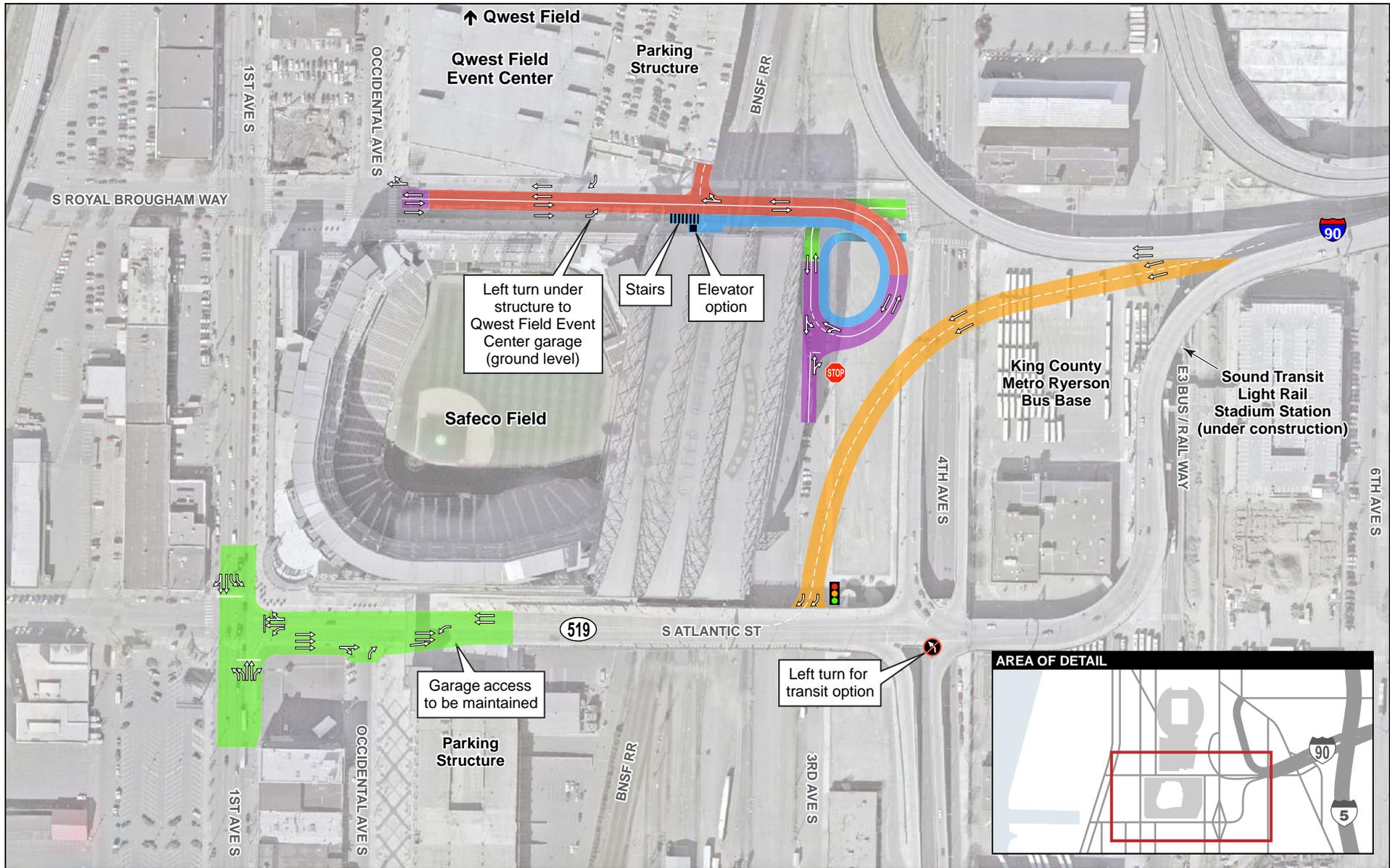
3 What are the project alternatives?

Two alternatives were analyzed for this report: the Proposed Action and the No Build Alternative. The Proposed Action, which has been designed to meet current and projected future traffic conditions, was developed following the completion of an earlier NEPA Environmental Assessment and associated Finding of No Significant Impact (FONSI) (USDOT et al., 1997) and builds on the more recent screening and evaluation of 21 preliminary Phase 2 options by WSDOT in a feasibility study (KPFf et al., 2006).

Proposed Action

The Proposed Action (SR 519 Intermodal Access Project Phase 2: Atlantic Corridor) would connect the existing westbound off-ramp from I-5 and I-90 to the existing South Atlantic Street overpass. It would also provide improvements at the intersection of First Avenue South and South Atlantic Street to accommodate traffic more efficiently along the route. In addition, it would build a grade-separated crossing over the railroad tracks at South Royal Brougham Way. These proposed improvements are described in more detail below and are illustrated on Exhibit 2-2. Traffic flow with the proposed improvements in place is shown in Exhibit 2-3. All proposed improvements would comply with the Americans with Disabilities Act of 1990 (ADA).

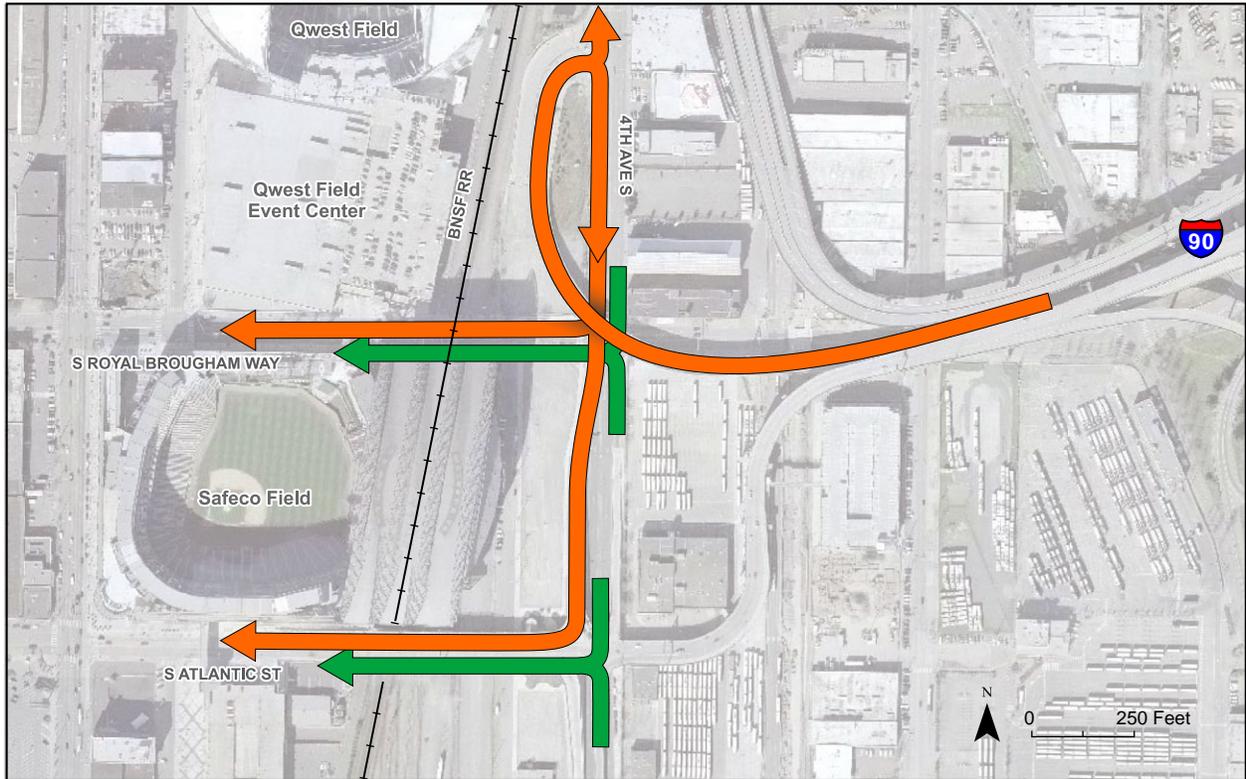
I-90 Off-Ramp to South Atlantic Street. A new two-lane elevated ramp connection would be built from westbound I-90 to terminate at a signalized T-intersection on the South Atlantic Street railroad overpass.



- █ Arterial Bridge
- █ Elevated Ramp
- █ Pedestrian Bridge
- █ Surface Improvements
- █ Fill Embankment

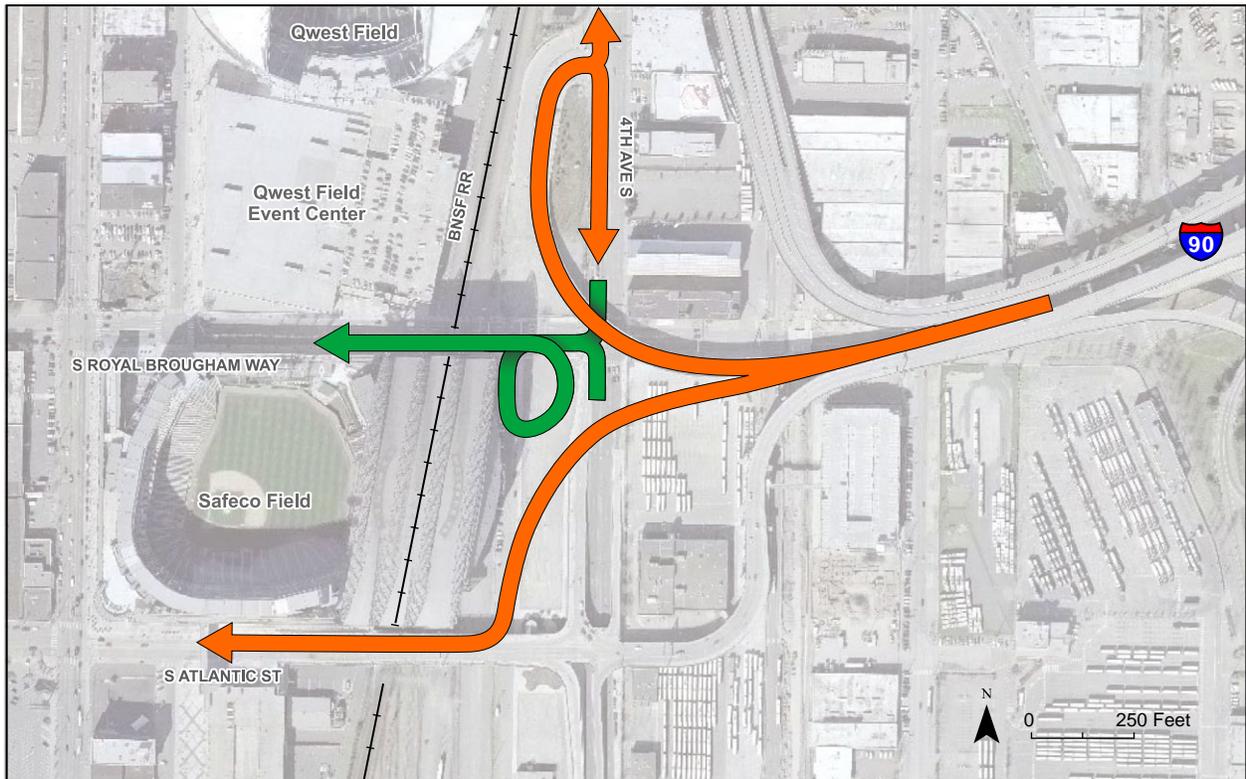


Exhibit 2-2
Project Elements



- Existing Westbound Regional Routes
- Existing Westbound Local Routes

Existing Westbound Travel Routes



- Proposed Westbound Regional Routes
- Proposed Westbound Local Routes

Proposed Westbound Travel Routes

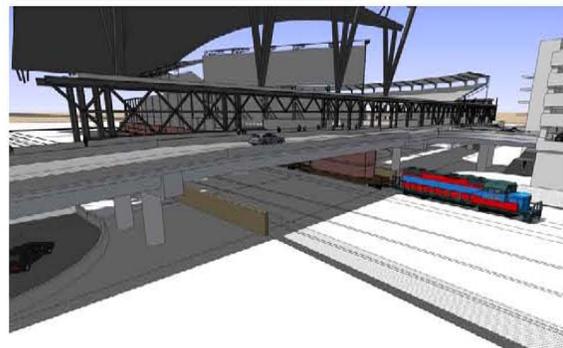
Exhibit 2-3
**Existing and Proposed
 Westbound Travel Routes**

The new South Atlantic Street connection would serve westbound freeway traffic exiting I-90 and I-5. The new ramp would be entirely elevated, passing over Fourth Avenue South and Third Avenue South and connecting to the South Atlantic Street overpass southeast of Safeco Field. Exiting northbound I-5 traffic would be routed to South Atlantic Street, while exiting southbound I-5 traffic would have the option of using either the new off-ramp to South Atlantic Street or the existing I-90 off-ramp to Fourth Avenue South.

South Royal Brougham Way Railroad Overpass. The South Royal Brougham Way at-grade railroad crossing would be closed, but it could possibly be opened to public services in the event of a major emergency in the vicinity. A new two-lane elevated structure would be built, connecting Occidental Avenue South to Third Avenue South. The new overpass would transport vehicular, pedestrian, and bicycle traffic over the railroad tracks and provide a new connection and entrance from South Royal Brougham Way to the second level of the Qwest Field Event Center parking garage. The new ramp would accommodate local two-way traffic and provide ADA-compliant access.



Proposed ramp at east end of South Royal Brougham Way railroad overpass



South Royal Brougham Way existing at-grade railroad crossing (left) and proposed overpass (right)

Improvements to the Intersection of First Avenue South and South Atlantic Street. The project would widen the intersection by adding additional turn lanes to each approach. Existing parking lanes along First Avenue South would be converted into travel lanes, with a new eastbound lane added to South Atlantic Street. Sidewalks along the southern edge of

coordinate with and minimize unwanted effects on the following:

- Stadiums and Event Center activities
- Port of Seattle container operations
- Washington State Ferries
- BNSF Railway mainline and yard operations, AMTRAK mainline operations, and Sound Transit commuter rail operations
- Sound Transit Link light rail operations, Sounder commuter rail service, and Regional Express bus operations
- King County Metro Ryerson Bus Base operations and Metro bus service throughout the affected area, including through-routes operating within the area, and access to the bases and downtown Seattle transit tunnel
- Greater Duwamish Manufacturing and Industrial Center freight operations

Temporary construction staging areas would be required to store equipment and materials during construction. A gravel lot owned by WSDOT, bounded by South Atlantic Street and South Royal Brougham Way, and Third Avenue South and Fourth Avenue South, would serve as the primary construction staging area for the SR 519 Phase 2 project. This lot is vacant, and no adverse environmental effects are expected from staging at this location. Other temporary staging areas would be determined through consultation with King County and the City of Seattle during project design.

No Build Alternative

Under the No Build Alternative, the three proposed Phase 2 components discussed above would not be built. Westbound traffic exiting from I-5 and I-90 would continue to flow as shown in Exhibit 2-3.

4 What permits would be required to build the project?

The SR 519 Phase 2 project would be built under close regulatory scrutiny. WSDOT would apply to the State of Washington, King County, and the City of Seattle for a number of permits and approvals. They would most likely include, but not necessarily be limited to:

- National Pollutant Discharge Elimination System (NPDES) Construction Stormwater General Permit (Washington State Department of Ecology)
- Wastewater Discharge Approval (King County)
- Street Use Permit (City of Seattle)
- Side Sewer Permit (City of Seattle)
- Noise Variance (City of Seattle)

WSDOT will confirm the requirement for these and other permits as engineering design and construction planning proceed in coordination with the permitting authorities.

Chapter 3 Methodology

1 What is the study area for hazardous materials and how was it selected?

The study area and databases that were reviewed for the hazardous materials analysis encompasses the land within a 1-mile radius of Safeco Field (1250 First Avenue South) and includes the intersection of Fourth Avenue and South Royal Brougham Way and the intersection of First Avenue and South Atlantic Street. This radius was selected because if contamination is present, the proximity of the contamination could affect the project, or the project could affect the contaminated sites. After reviewing the databases, it was concluded that all sites of concern were located within ½ mile of the project.

2 How was information collected for this report?

The project team obtained information on potential and existing conditions as well as relevant historical conditions within the project study area. The 1-mile radius was selected as the likely greatest lateral extent that historical contamination could potentially affect the project. In general, the closer a potential site is to the project site, the greater the potential for affecting the project.

Information was collected from multiple data sources as described below.

Regulatory Database Review

In March 2007, an environmental database research service, Environmental Data Resources, Inc. (EDR), collected information for the project study area. EDR's database searches include the sources listed in Exhibit 3-1. Several different radii were selected based on the database to be searched. Exhibit 3-2 summarizes the search distances that ranged from ¼ to 1 mile.

EXHIBIT 3-1. ENVIRONMENTAL REGULATORY AGENCY DATABASES USED		
Database	Abbreviation	Contents
Comprehensive Environmental Response, Compensation, and Liability Information System	CERCLIS	Data on potentially hazardous waste sites that have been reported to the U.S. Environmental Protection Agency (EPA).
CERCLIS-No Further Remedial Action Planned	CERCLIS-NFRAP	Sites removed from CERCLIS where no contamination was found or where contamination was removed quickly.
National Priority List	NPL	Hazardous waste sites for priority cleanup under the Federal Superfund Program (a subset of CERCLIS)
Resource Conservation and Recovery Information System	RCRIS	Sites that generate, transport, store, treat, and/or dispose of hazardous waste.
RCRA large quantity generators (LQGs)	RCRA-LQG	RCRA LQGs are facilities that generate more than 2,200 pounds of hazardous waste or more than 2.2 pounds of acutely hazardous waste per month.
RCRA small quantity generators (SQGs)	RCRA-SQG	RCRA SQGs are facilities that generate between 220 pounds and 2,200 pounds of hazardous waste per month. In Washington State, this size generator is known as a Medium Quantity Generator (MQG). Generators do not store, treat, or dispose of hazardous waste. Hazardous waste generation indicates a commercial or industrial activity that stores and uses hazardous materials.
RCRA Corrective Action Sites	RCRA-CORRACTS	RCRA-CORRACTS identifies hazardous waste handlers with corrective action (cleanup) activity.
State Confirmed or Suspected Contaminated Sites List	CSCSL	State equivalent to CERCLIS. Ecology records indicate sites with confirmed or suspected presence of contaminated soil, groundwater, surface water, sediment, or air.
State Hazardous Sites List/ Model Toxics Control Act (MTCA) Cleanup Program Sites Register	HSL	Contaminated sites that have been assessed and ranked using the Washington State Ranking Method. HSL is a subset of the CSCSL.
MTCA-No Further Action	MTCA-NFA	MTCA-NFA includes sites where Ecology has issued a letter of no further action and has accepted the site cleanup report.
State Independent Cleanup Reports List	ICR	Cleanup action reports received by Ecology for review and approval. Cleanup actions are done without Ecology oversight.
State Leaking Underground Storage Tank List	LUST	Reported leaking underground storage tank (LUST) incidents.
State Registered Underground Storage Tank List	UST	Registered underground storage tanks (USTs). State registration is not required for residential heating oil USTs.
State Landfill or Solid Waste Site Lists	LF	Inventory of state solid waste disposal facilities or landfills.

EXHIBIT 3-2. SUMMARY OF REGULATORY AGENCY LISTS REVIEWED			
Re6-gulatory Agency Database	Acronym	Search Distance	Number of Sites on the Databases
National Priority List	NPL	1.0 mile	1
Comprehensive Environmental Response, Compensation, and Liability System List, including No Further Remedial Action Planned	CERCLIS CERCLIS-NFRAP	0.5 mile	2
Resource Conservation and Recovery Information System - Storage and Disposal Facilities Lists/RCRA Corrective Action Reports	RCRIS /CORRACTS	1 mile	1
RCRIS – Small Quantity Generators	RCRA – SQG	0.25 mile	12
RCRIS – Large Quantity Generators	RCRA – LQG	0.25 mile	0
Confirmed or Suspected Contaminated Sites List	CSCSL	1 mile	32
Confirmed or Suspected Contaminated Sites List including sites designated as No Further Action	CSCSL/MTCA-NFA	0.5 mile	6
RCRA – Transport, Storage, or Disposal Facility	RCRA-TSD	0.5 mile	1
Record of Decision	ROD	1 mile	1
Washington State Hazardous Sites List	HSL	1 mile	0
Washington State Independent Cleanup Report Database	ICR	0.5 mile	48
Washington State Solid Waste Facility Database	LF	0.5 mile	0
Leaking Underground Storage Tanks	LUST	0.5 mile	26
Registered Underground Storage Tanks	UST	0.25 mile	11
Drycleaners registered with the Washington State Department of Ecology	DRYCLEANERS	0.25 mile	0

Different radii were selected for different data bases because of the type of sites associated with each database and their potential to affect the project and to capture and evaluate all potential sites that could affect the project. The radius was centered on Safeco Field and included the study area. The complete EDR reports, including aerial photographs and topographic maps are incorporated in Appendix A.

Historical Research

The objective of consulting historical sources is to investigate the history of the previous uses of the study area and

surrounding area that will help identify past uses that could have led to contamination that could affect or be affected by the project. Sources consulted include:

- Historical fire insurance maps (Sanborn Maps for 1916, 1950, and 1969)
- Polk Directories (1893, 1905, 1920, 1936, 1943-1944, 1955, and 1965)
- Historical aerial photographs (1966, 1975, 1992, and 2003)
- Current and historical topographic maps (1909, 1949, 1968, 1973, and 1983)

Previous Environmental Investigations

WSDOT provided documents and reports for studies conducted within the vicinity of the study area to the project team.

Relevant information from these reports was summarized and incorporated into this report.

Study Area Site Reconnaissance

A field reconnaissance, or “windshield” survey, was conducted from publicly accessible roads and sidewalks to observe general site conditions (i.e., poor housekeeping, contamination, and/or cleanup activity). The primary purpose of this reconnaissance was to identify any other sites with contamination potential that were not previously recognized, and to eliminate identified sites that do not pose a potential hazard to the project.

Data Validation

The project team reviewed public files from the Washington State Department of Ecology for specific properties where hazardous materials were likely to exist. The likelihood of hazardous materials was determined by researching the EDR report and historical background. This review focused on identifying the nature and extent of known contamination and cleanup activities on properties within the study area.

Sixty-seven sites with evidence of current, past or potential contamination that are located within the boundaries of the study area (1 mile) were identified. Based on the review of

environmental database records and historical records, site reconnaissance, and review of Ecology files, 24 sites were determined to be sites of concern and they were located within ½ mile of the project. The other forty-three were eliminated from further consideration for the following reasons:

- They were located downgradient, crossgradient, or far away (> ½ mile) from the construction footprint
- Soil and groundwater were not suspected to be contaminated with hazardous materials. These sites were only generators of wastes or were granted no further action (NFA) status by Ecology.
- They were UST sites with no known leaks.

Additional information about this screening process is provided under question 8 in Chapter 4, *What are the hazardous materials and contaminated sites of concern in the study area?*.

3 What methods were used to evaluate potential effects of the Proposed Action and the No Build Alternative?

The hazardous materials project team evaluated the potential construction and permanent effects of the project due to the presence of hazardous materials, hazardous substances, hazardous wastes, and contaminated environmental media. This discipline report considers effects on human health and the environment resulting from the possible release of contaminants and alteration of contaminant migration pathways.

The Proposed Action was analyzed to determine the short-term construction effects based on:

- Release of possible contaminants in soil or groundwater to other environmental media, such as air or surface water
- Need to dispose of or treat contaminated media offsite
- Alteration of contaminant migration pathways
- Encountering unknown contamination or USTs

- Demolition of structures with possible hazardous materials
- Hazardous materials or substances used during construction
- Worker and public health and safety
- Regulatory requirements

The Proposed Action and No Build Alternative were analyzed to determine long-term or permanent effects related to:

- Property or right-of-way acquisition and associated environmental liability
- Time frame to remediate possible contaminated sites and the effect on construction costs and schedules
- Human health and the environment from possible long-term cleanup on or adjacent to the alternatives
- Long-term operation and maintenance

See Appendix D for a discussion of potential regulatory considerations related to the effects discussed in this report.

4 What would be considered a substantial adverse effect on hazardous materials?

NEPA regulations do not provide thresholds to determine if hazardous materials effects are substantial. A substantial adverse effect would be one that has a high likelihood of occurrence, which presents a risk to public safety or environmental health.

Chapter 4 Affected Environment

1 What is the historical land use of the project study area?

The study area was originally tidelands, swamps, and mudflats. Between 1895 and 1929 the area was dredged, sluiced, and filled to raise the ground about 2 feet above the high-tide line. The fill material covers a depth ranging from 4 to 35 feet.

After the area was filled, it became an industrial district with businesses supporting the Port of Seattle, the railroads, and many small to medium-size facilities. The smaller businesses included foundries, metal shops, rail maintenance yards, and fuel supply depots. The potentially hazardous materials used at rail maintenance yards include solvents, diesel, gasoline, creosote, caustics, paints, sandblasting materials, and metals.

There were numerous gas stations and auto wrecking/salvage yards, as well as warehouses for electrical supplies, petroleum products, automobile and truck parts, paint supplies, and many other businesses.

Since the 1970s, the neighborhood has slowly transitioned from an industrial district to the home of several professional sports teams. Construction of the Kingdome, which began in 1973, was completed in 1976 and was home to Seattle's professional baseball (Mariners) and football (Seahawks) teams until the late 1990s. Safeco Field, which became the new home of the Mariners, was built just south of the Kingdome in 1998. The Kingdome was imploded in 2000, and a new football stadium, Qwest Field, was built just north of the project site and opened in 2002.

2 What is the physical environment of the project study area?

The physical environment of the project study area determines the potential fate (possible degradation products and mobility) of contaminants released to the environment. Fate and transport

of contaminants, in general terms, are controlled by the mobility of the chemicals, the rate of breakdown (degradation) of the chemicals in the environment, pathways the chemicals can take to travel from their point of release such as volatilization to the air or dissolution to water (surface water or groundwater), and whether the transport along those pathways is enhanced or limited by the physical environment. For example, an environment with soils that have high permeability can provide an easier means for a contaminant to travel (via groundwater) beyond the point of release. An environment where groundwater occurs close to the surface can also provide a mechanism for contaminants to be readily transported away from the point of release.

The topography of the study area is the result of glacial erosion and deposition, and artificial fill that was emplaced to bring the ground to an elevation above the high-tide line.

The study area is located in the Puget Sound Lowlands, which contains several north-south trending Pleistocene glacial troughs. The study area is part of the Duwamish-Green River Valley trough. Most of the landforms seen today in Western Washington are the result of more than a million years of glacial activity. During the recession of the last ice age, major alluvial deposition occurred in the Duwamish River basin and Elliott Bay. The vicinity's largest distinct sediment deposits are in the Duwamish Valley, with depths reaching 100 to 150 feet. Tidelands in Elliott Bay developed as part of deposition at the mouth of the Duwamish River. Isostatic rebound, when earth formerly compacted by glaciers expands, appears to have resulted in shallow water over a long period. The counterclockwise flow in Elliott Bay also contributed to the extension of the tidelands into the study area.

The tide flats in the study area have undergone extensive urban and industrial development over the past 100 years. Seattle residents filled much of the tide flats over a 20-year period from 1895 to 1916 to create buildable land. The average thickness of the fill is 15 feet, but it can range from 4 feet to over 30 feet.

Groundwater in the study area is very close to the surface, generally 3 to 6 feet below the ground surface. The general direction of the groundwater flow is to the west toward Elliott Bay, but the fill has caused some localized variations (HWA, 2004).

3 What are the results of the regulatory agency database search?

The project team reviewed the results of the environmental regulatory database search to identify sites in or adjacent to the project study area that handle hazardous materials, substances, or wastes, or that have the potential to be contaminated or have been contaminated in the past. Exhibit 3-2 summarizes the databases reviewed, the specific distances searched, and the total number of sites within the search distance. The EDR reports (Appendix A) include figures that identify the locations of reportable sites within the specified search distances. EDR assigned a map identification number (ID) to each site. Those map IDs are used throughout this discipline report.

Potential sites located within a ½-mile radius of the project footprint were evaluated for hazardous materials. The potential sites were divided into two categories: “sites of concern” (described in Exhibit 4-1 and shown on Exhibit 4-2) and all other sites (described in Exhibit 4-3 and shown on Exhibit 4-4). Exhibits 4-1 and 4-3 represent all of the potential sites. The classification of a site into one of the two categories was based on the site's potential to affect or be affected by the project. The selection as a site of concern was based on the site's proximity to the project, the historical land uses, the media contaminated, the contaminants, and the cleanup status. In general, the sites of concern have had substantial contamination that could affect or be affected by project activities.

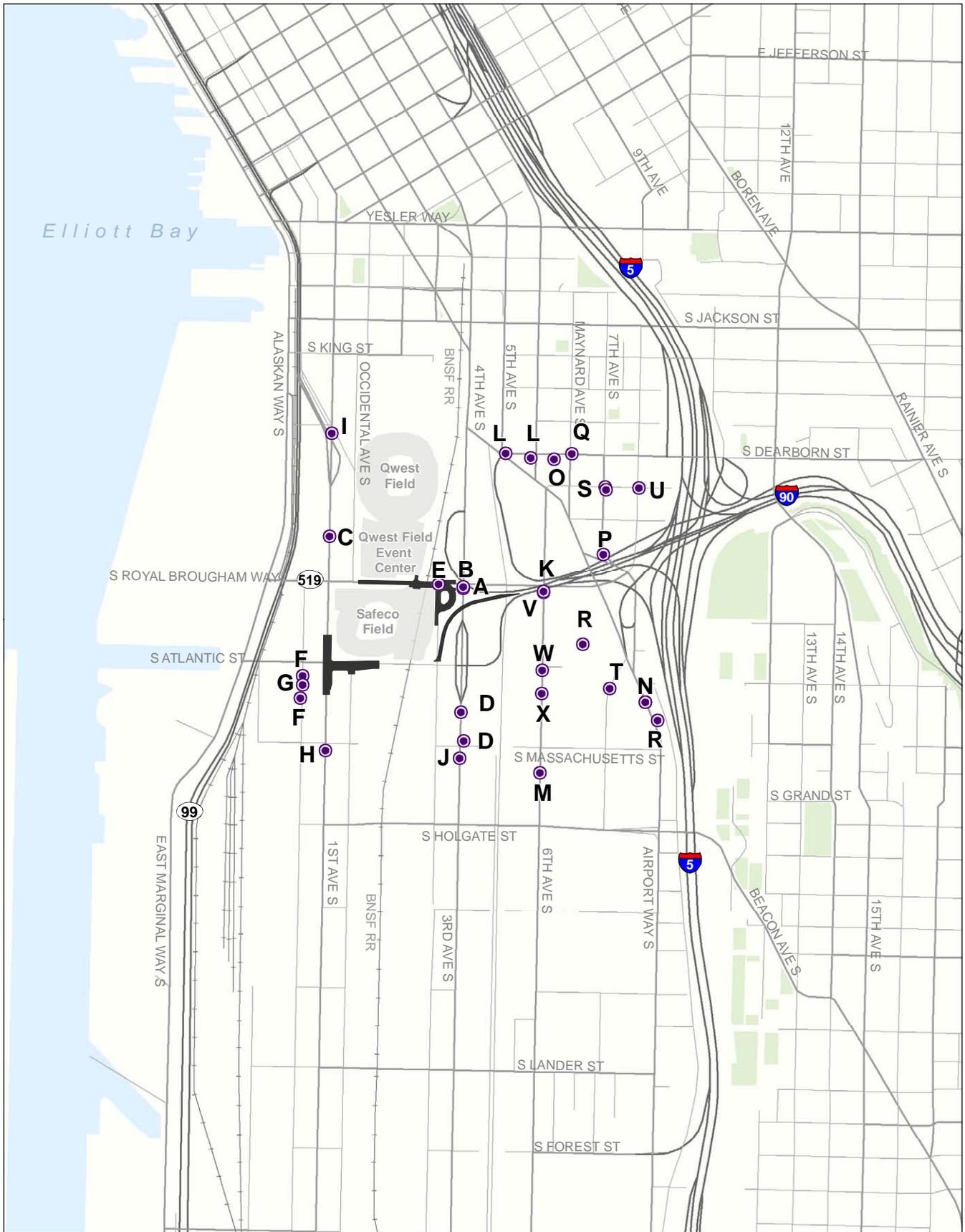
The team identified 24 sites on the regulatory agency databases as sites of concern (Exhibits 4-1 and 4-2). In general, the sites of concern are those that have had substantial contamination that could affect or be affected by the project. Forty-three other sites within the study area were also evaluated but were not considered to be sites of concern (Exhibits 4-3 and 4-4).

EXHIBIT 4-1. SITES OF CONCERN LISTED ON REGULATORY AGENCY DATABASES							
LOCATION (MILES) ^a	MAP ID	EDR ID	Site Name and Address	Agency List	Contaminated Media	Contaminant	Cleanup Status
1/8 ENE	A	D16	Metro Ryerson Operating Base, 1220 Fourth Avenue South	LUST, UST, ICR, RCRA-SQG, FINDS, WA Manifest	Soil, groundwater, RCRA: No violations	UST: antifreeze, diesel, used/waste and motor oil, other petroleum substance	LUST: cleanup started 12/12/1995, UST: 11 tanks removed, 4 tanks operational, ICR: Interim cleanup report received 2/09/1996
1/8 ENE	B	D20	WA DOT, 1213 Fourth Avenue South	LUST, UST, ICR	Soil	UST: unleaded gasoline, ICR: Petroleum products	LUST: cleanup started 7/17/2001, UST: tank removed ICR: Interim cleanup report titled "Decommissioning Final" received 01/10/2002
1/8 NNW	C	C23	Kohlstamm H and Co., Inc., 1016 First Avenue South	EDR Historical Cleaners	NA	NA	NA
¼ SE	D	E29 & I47	Music-Vend Distributing Co., 1550 Fourth Avenue South	UST, RCRA-SQG, FINDS, CSCSL NFA, VCP, LUST ^b	None listed	Leaded and unleaded gasoline, other petroleum substances	RCRA: No violations, UST: 4 tanks removed, CSCSL NFA: final independent RA report received 12/18/2006, VCP: Independent RA
1/8 ENE	E	3	Major League Stadium Public Facilities, Third South and South Royal Brougham Way	LUST, UST, ICR	Soil	UST: used/waste oil, ICR: petroleum Products	LUST: reported cleaned up as of 11/26/1997, UST: tank removed, ICR: interim cleanup report received 12/01/1997
1/8 SW	F	B9-B10	Coast Crane Co. of WA 1531 Utah Avenue South	RCRA-SQG, FINDS, ICR, LUST, UST	Soil, groundwater	ICR: petroleum products, UST: used/waste oil	ICR: interim cleanup report received 10/29/1999, LUST: reported cleaned up as of 1/10/2005, UST: 5 tanks removed
1/8 SW	G	24	Seattle City Light - Massachusetts Substation, 1555 Utah Avenue South	ICR	Soil	PCBs	No status reports listed, Ecology report dated 04/24/1991

EXHIBIT 4-1. SITES OF CONCERN LISTED ON REGULATORY AGENCY DATABASES							
LOCATION (MILES) ^a	MAP ID	EDR ID	Site Name and Address	Agency List	Contaminated Media	Contaminant	Cleanup Status
1/8 SSW	H	H44	Industrial Rebuild Inc., 1714 First Avenue South	RCRA-SQG, FINDS	NA	NA	4 generator-general requirements violations
1/8 NNW	I	G45	Union Pacific Railroad, 801 First Avenue South	ICR, LUST, UST	Soil	Petroleum products	Final cleanup report received 11/15/1996, LUST: reported cleaned-up 11/15/1996, UST: removed
¼ SSE	J	K52	Mobile SRV Brakes, 1728 Fourth Avenue South	CSCSL, FINDS, VCP	Soil, Groundwater	Petroleum products, non-halogenated solvents	CSCSL: independent remedial action, VCP: independent remedial action
¼ E	K	M60	Leavitt Shay Industrial Bldg., 1217 Sixth Avenue South	LUST, ICR	Soil	Petroleum products	LUST: Reported cleaned up 7/27/1995, ICR: Final cleanup report received 4/3/1995
¼ NE	L	O68-O88	Shell Gas Station, 511 South Dearborn Street	ICR, LUST, UST RCRA ^b	Soil, groundwater	Petroleum products	ICR: Interim cleanup & monitoring of soil and groundwater report received 6/21/2002, LUST: monitoring soil & groundwater report dated 8/15/2000, UST: 1 tank containing leaded gasoline and 2 with unleaded gasoline are reported operational.
¼ SE	M	R96	Maust Terminal, 1762 Sixth Avenue South	CSCSL, RCRA-SQG, FINDS, LUST, UST	CSCSL: soil and groundwater	CSCSL: petroleum products, non-halogenated solvents, PAH confirmed and metals and cyanide suspected	CSCSL: Site is awaiting hazard assessment, RCRA: no violations found, LUST: awaiting cleanup as of 4/13/1992, UST: 2 tanks removed

EXHIBIT 4-1. SITES OF CONCERN LISTED ON REGULATORY AGENCY DATABASES							
LOCATION (MILES) ^a	MAP ID	EDR ID	Site Name and Address	Agency List	Contaminated Media	Contaminant	Cleanup Status
¼ E	N	99 & U109	Metro Atlantic Operating Base, 1555 Airport Way South	CSCSL	Soil, sediments, groundwater, and surface water	Petroleum products confirmed in soil. Petroleum products, metals, cyanide and inorganics suspected in soil, sediments, groundwater, and surface water. PAH suspected in sediments.	Awaiting site hazard assessment
¼ NE	O	107	Pacific Fish Company, South Dearborn Street	LUST, UST	Soil	UST: Leaded gasoline	LUST: Reported cleaned up 5/16/2002, UST: 1 tank removed
¼ ENE	P	108	City of Seattle, Ken Station, 1030 Seventh Avenue South	LUST, UST	Soil, groundwater	UST: leaded and unleaded gasoline, diesel	LUST: Cleanup started report received 6/1/1995, UST: 3 tanks removed, 3 tanks operational
¼ NE	Q	111	Spic N Span Cleaners Corp. Inc, 652 South Dearborn Street	RCRA-SQG, CSCSL, FINDS, UST, VCP, ICR, Inactive Drycleaners	CSCSL and ICR: soil and groundwater	CSCSL: halogenated organics, chlorinated solvents and petroleum products	RCRA: no violations found, CSCSL: NFA, UST: 2 tanks removed, ICR: interim cleanup report received 11/03/1997
¼ E	R	U112-U113	Northwest EnviroServices, Emerald Recycling, 1500 to 1700 Airport Way South	CSCSL, PADS, FINDS, RCRA-LQG, RCRA-TSDF, UST, RAATS, CORRACTS, CERC-NFRAP, WA and NY MANIFEST, HAZNET	CSCSL: Soil and groundwater	CSCSL: halogenated organic compounds are suspected	RCRA: RFI Approved 6/16/2004, 72 violations between 3/13/1984 and 8/18/2004. Ongoing groundwater monitoring conducted by CH2M HILL, UST: a tank closed in place, CORRACTS: Solid Waste Landfill, MANIFEST: Transfer facility, generator and TSD of mercury

EXHIBIT 4-1. SITES OF CONCERN LISTED ON REGULATORY AGENCY DATABASES							
LOCATION (MILES) ^a	MAP ID	EDR ID	Site Name and Address	Agency List	Contaminated Media	Contaminant	Cleanup Status
¼ ENE	S	W115-W116	City of Seattle, Charles Street West, 705 South Charles Street	ICR, LUST, RCRA-SQG, FINDS	LUST and ICR: Soil, groundwater	ICR: Petroleum products	ICR: Interim cleanup report received 12/13/1991, RCRA: No violations, LUST: Cleanup started reported received 5/21/1995
¼ ENE	T	32WSDOT ^b	Freeway Garage, 1512 Eighth Avenue South	LUST	Unknown	Unknown	Unknown
¼ ENE	U	40 ^b	Seattle Admin. Service, 805 South Charles Street	LUST, RCRA, UST	Unknown	Unknown	Unknown
¼ E	V	262 ^b	E. J. Bartells, 1212 Sixth Avenue South	UST	Unknown	Unknown	Unknown
¼ E	W	265 ^b	Princeton Packaging, Inc., 1505 Sixth Avenue South	UST	Unknown	Unknown	Unknown
¼ E	X	266 ^b	Sid Eland, Inc., 1565 Sixth Avenue South	UST	Unknown	Unknown	Unknown
^a Distance from Safeco Field, which is located close to the center of the project footprint. ^b Indicates information obtained from the 1996 WSDOT report. All other information was obtained from EDR, March 12, 2007. RA = remedial action PAHs = polycyclic aromatic hydrocarbons							



Note: See Exhibit 4-1 for information on each numbered site. Some sites listed by EDR have two addresses, resulting in two points with the same ID.

Source: EDR (2007), City of Seattle (2007), and WSDOT (1996)

**Exhibit 4-2
Locations of Sites of Concern Listed
on Regulatory Agency Databases
near the SR 519 Atlantic
Access Corridor**

● Sites of Concern

█ Project



EXHIBIT 4-3. OTHER SITES LISTED ON REGULATORY AGENCY DATABASES							
LOCATION (MILES) ^a	MAP ID	EDR ID	Site Name and Address	Agency List	Contaminated Media	Contaminant	Cleanup Status
1/8 NW	1	A1-A2	Service Station 1, Hastings Tire Service, 1200 First Avenue South	UST, EDR Historical Auto Stations	NA	NA	UST: 6 tanks removed
1/8 NW	2	4	Hubbard and Benefiel 1121 First Avenue South	EDR Historical Auto Stations	NA	NA	NA
1/8 SW	3	5	Fisher Bag Co. 1560 First Avenue South	RCRA-SQG, FINDS	NA	NA	No violations found
1/8 WSW	4	B6	Fortune 84 South Atlantic Street	UST	NA	NA	Tank removed
1/8 NNW	5	C7	Kohl and Kohl 1046 First Avenue South	EDR Historical Auto Stations	NA	NA	NA
1/8 NNW	6	C8 & C11	Kingdome Station 1046 First Avenue South	FINDS, VCP, CSCSL, LUST, UST	Soil, groundwater	CSCSL: petroleum products, UST: leaded and unleaded gasoline, used/waste oil	VCP: Independent remedial action, CSCSL: independent remedial action, LUST: cleanup started report received 8/29/1995, UST: 12 tanks removed
1/8 ENE	7	D12	Saybolt Inc., Seattle 1225 Fourth Avenue South., Ste. 1	RCRA-SQG, FINDS	NA	NA	No violations found
1/8 ENE	8	D13	Arden Farms Gas Station 1255 Fourth Avenue South	EDR Historical Auto Stations	NA	NA	NA

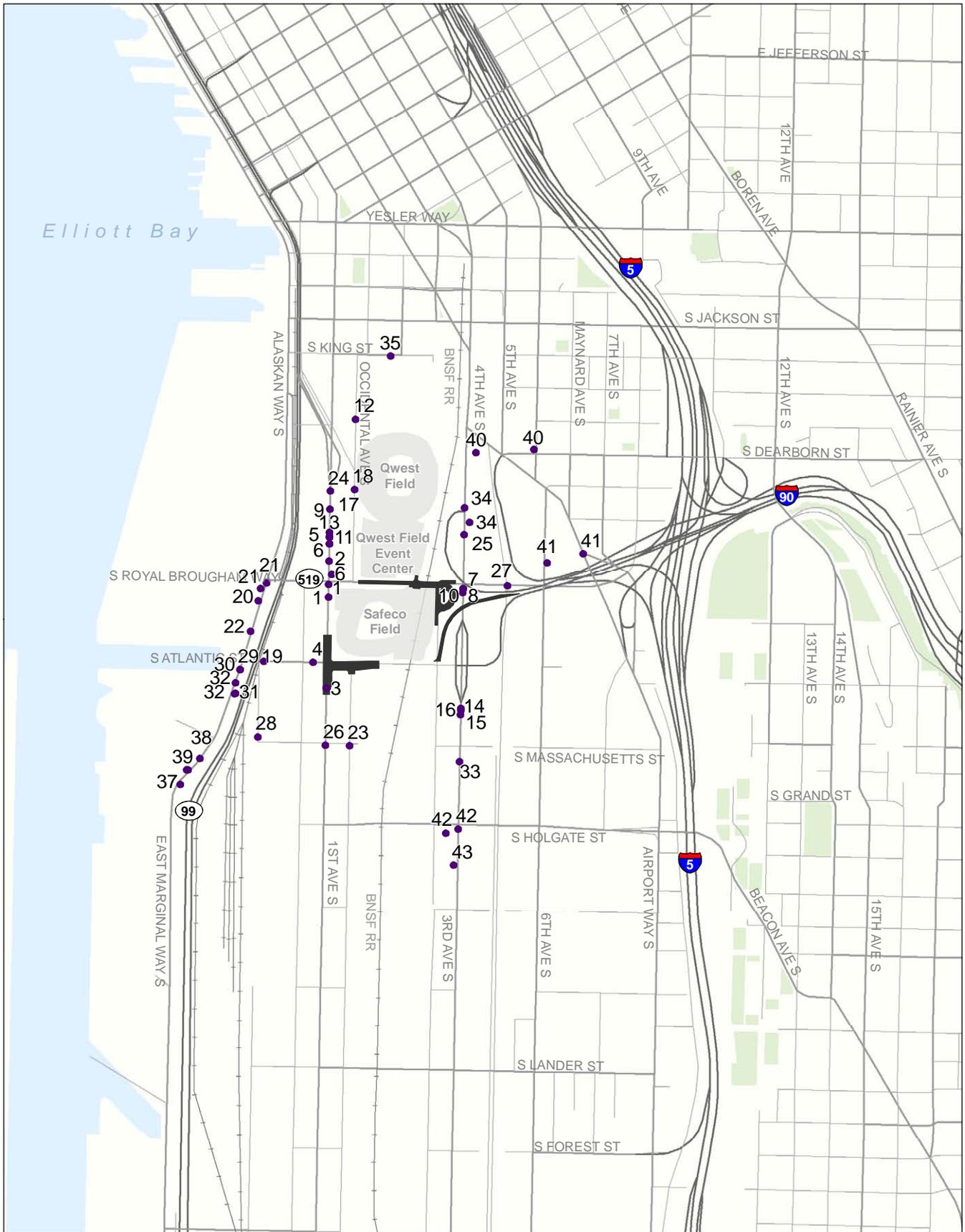
EXHIBIT 4-3. OTHER SITES LISTED ON REGULATORY AGENCY DATABASES							
LOCATION (MILES) ^a	MAP ID	EDR ID	Site Name and Address	Agency List	Contaminated Media	Contaminant	Cleanup Status
1/8 NNW	9	C14	Patek and Co. 1020 First Avenue South	EDR Historical Auto Stations	NA	NA	NA
1/8 ENE	10	D18-D19	Maxwell Petroleum Corp., Zilsdorf C E, 1223 Fourth Avenue South	EDR Historical Auto Stations	NA	NA	NA
1/8 NNW	11	C22	Olympic Reprographics, 1016 First Avenue South	RCRA-SQG, FINDS	NA	NA	No violations found
1/8 NE	12	25	Kingdome-South Parking Lot, Seattle Tide Lands	UST	None listed	Diesel	Tank removed
1/8 NNW	13	C26	The Palmers Building, 1000 First Avenue South	RCRA-SQG, FINDS	NA	NA	No violations found
1/8 ESE	14	E27	Hansell Harold N, 1532 Fourth Avenue South	EDR Historical Auto Stations	NA	NA	NA
1/8 ESE	15	E28	Studeville Cornelius, 1540 Fourth Avenue South	EDR Historical Auto Stations	NA	NA	NA
1/8 SE	16	E30	Gray Rolland J, 1562 Fourth Avenue South	EDR Historical Auto Stations	NA	NA	NA
1/8 NNW	17	31	Transmate, 902 First Avenue South	RCRA-SQG, FINDS	NA	NA	No violations found

EXHIBIT 4-3. OTHER SITES LISTED ON REGULATORY AGENCY DATABASES							
LOCATION (MILES) ^a	MAP ID	EDR ID	Site Name and Address	Agency List	Contaminated Media	Contaminant	Cleanup Status
1/8 N	18	32	Squire Properties, 901 Occidental Avenue South	RCRA-SQG, FINDS	NA	NA	No violations found
1/8 WSW	19	33	Bemis Co., Inc., Fourth, 55 South Atlantic Street	RCRA-SQG, FINDS	NA	NA	No violations found
1/8 W	20	F34	Kohl and Kohl, 1203 South Alaskan Way	EDR Historical Auto Stations	NA	NA	NA
1/8 W	21	F35-F37	Stevedoring Svcs of America, Terminal 37, 1201 Alaskan Way South	ICR, LUST, UST, RCRA-SQG, FINDS	Soil, groundwater	ICR: Petroleum Products, UST: diesel, unleaded gas, used/waste oil	ICR: Interim cleanup report dated 11/05/1996, LUST: cleanup started report received 06/01/1995, UST: 4 tanks removed, 1 closed in place, RCRA: No violations
1/8 W	22	38	Ellis Automotive Service, 1255 Alaskan Way	EDR Historical Auto Stations	NA	NA	NA
1/8 S	23	39	Johnston Roy E, 1701 Occidental Avenue	EDR Historical Auto Stations	NA	NA	NA
1/8 NNW	24	G40	Squire Shop Warehouse (Former) (2 Reports), 826 First Avenue South	ICR	Soil	Petroleum products	Interim cleanup report received 2/3/1993
1/8 NE	25	41	Romac Industries Inc, 1064 Fourth Avenue South	FINDS, RCRA-LQG, FTTS	NA	NA	RCRA: no violations found, FTTS lists 2 violations
1/8 SSW	26	H42	Snyder Property, 1700 First Avenue South	FINDS, CSCSL NFA, VCP	NA	NA	CSCSL NFA: list independent remedial action, VCP: NFA after IRAP

EXHIBIT 4-3. OTHER SITES LISTED ON REGULATORY AGENCY DATABASES							
LOCATION (MILES) ^a	MAP ID	EDR ID	Site Name and Address	Agency List	Contaminated Media	Contaminant	Cleanup Status
1/8 ENE	27	43	Atkinson Dillingham, 500 South Royal Brougham Way	RCRA-SQG, FINDS	NA	NA	No violations found
¼ SE	28	I48	Midas Muffler, 1550 Fourth Avenue South	LUST, UST, ICR	LUST: soil, groundwater, ICR: soil, groundwater	UST: used/waste oil, ICR: petroleum products	LUST: cleanup started report received 12/06/1993, UST: tank removed, ICR: Interim cleanup report received 11/16/1998
1/8 WSW	29	J49-J50	US CG Integrated Support Command Seattle, 1519 Alaskan Way South	PADS, FINDS, RCRA-LQG, CERC-NFRAP, WA Manifest, ICR	ICR: Soil	ICR: Petroleum products and metals	RCRA lists 2 generator-general requirements violations, CERCLIS-NFRAP: archive site 3/27/1989, ICR: Final Cleanup report received 6/4/1996
¼ WSW	30	J51	USCG Support Center, Seattle, 1519 Alaskan Way South	LUST, SPILLS, UST	Soil, surface water-marine,	SPILLS: Petroleum 2/5/2002, unknown 5/07/2003, diesel 7/31/2000, petroleum 1/21/2001, hydraulic oil 1/31/2002, petroleum 11/13/1999	LUST: reported cleaned-up 6/1/1995, UST: 3 tanks removed
¼ WSW	31	J53	US GSA, 1555 Alaskan Way South	RCRA-SQG, CSCSL, FINDS, VCP	RCRA: no violations, CSCSL: groundwater, soil	CSCSL: petroleum products	CSCSL: independent remedial action, VCP: independent remedial action
¼ WSW	32	J54-J55	Federal Warehouse, 1555 Alaskan Way South	LUST, UST, ICR	Soil, groundwater	UST: unleaded gasoline, heating fuel, ICR: petroleum products	LUST: reported cleaned-up 2/11/2000, UST: 1 tank remove, 2 tanks are exempt, ICR: Final cleanup report received 2/11/2000
¼ SSE	33	K56	Atlas Supply, 1736 Fourth Avenue South	ICR	Soil	Petroleum products	Interim cleanup report received 10/22/1996

EXHIBIT 4-3. OTHER SITES LISTED ON REGULATORY AGENCY DATABASES							
LOCATION (MILES) ^a	MAP ID	EDR ID	Site Name and Address	Agency List	Contaminated Media	Contaminant	Cleanup Status
¼ NNE	34	L57-L58	The Salvation Army, 1000 Fourth Avenue South	LUST, UST, RCRA-SQG, FINDS, ICR	Soil	Petroleum products	LUST: reported cleaned-up 6/1/1995 UST: 1 tank removed, 1 tank closed in place, RCRA: no violations, ICR: Interim cleanup report received 8/5/1991
¼ NNE	35	59	WA ST Football Soccer Stadium & Expo Cen., Former Kingdome Site, 201 South King	CSCSL NFA, RCRA ^b	None listed	None listed	NFA dated 7/1/2002, after IRAP
¼ S	36	62	MacMillan-Piper Company (BNRR), 185 South Holgate Street	ICR	Soil	Petroleum products	Final cleanup report received 7/13/1993
¼ SW	37	N63-N64	Flint Ink Corporation, 1727 Alaskan Way	RCRA-SQG, FINDS, ICR, LUST, UST	RCRA: no violations, ICR and LUST: soil, groundwater	ICR: Petroleum products, UST: heating oil	ICR: Final cleanup report received 3/20/2000, LUST: reported cleaned-up on 3/20/2000, UST: tank removed
¼ SW	38	N65-N66	GATX Facility - Pier 34, 1733 Alaskan Way South	ICR	Soil, groundwater	Metals, petroleum products, non-halogenated solvents, polynuclear aromatic hydrocarbons	Metals, petroleum products, non-halogenated solvents, polynuclear aromatic hydrocarbons - interim clean-up (of soil) report received 1/13/2000, petroleum - interim cleanup (of soil) report received 9/23/1997, metals - interim cleanup (of groundwater) report received 1/22/2001

EXHIBIT 4-3. OTHER SITES LISTED ON REGULATORY AGENCY DATABASES							
LOCATION (MILES) ^a	MAP ID	EDR ID	Site Name and Address	Agency List	Contaminated Media	Contaminant	Cleanup Status
¼ SW	39	N67	GATX Facility, 1733 Alaskan Way South	RCRA-SQG, CSCSL	CSCSL: confirmed contamination of soil and groundwater Sediments	Confirmed contamination of soil and groundwater with petroleum products, non-halogenated solvents, metals, cyanide, and PAH. Sediments suspected to be contaminated with petroleum products, non-halogenated solvents, metals, cyanide, PCBs, and PAH.	Independent remedial action cleanup, RCRA: no violations
¼ NE	40	O89-O93	Uwajimaya Village, 514 and 524 Dearborn Avenue South	UST, ICR, CSCSL NFA, FINDS, VCP,	Soil	Petroleum products	12/22/1999 Ecology issued NFA, UST: 4 tanks removed
¼ ENE	41	P90-P91	Romaine Electric, 1101 Airport Way South	ICR, RCRA-SQG, FINDS, CSCSL NFA, VCP, UST ^b	Soil, groundwater	Petroleum products	RCRA: no violations, ICR: interim cleanup report received 1/28/1999, NFA after Assessment IRAP or VCP dated 8/12/1999
¼ SSE	42	Q94-Q95	Jack in the Box 1907 Fourth Avenue South	LUST, ICR	Soil, groundwater	ICR: petroleum products	LUST: Reported Cleaned-up 3/11/2003, ICR: interim cleanup report dated 10/16/1992
¼ SSE	43	Q98	Star Rentals and Sales 1919 Fourth Avenue South	LUST, UST	Soil, groundwater	UST: leaded and unleaded gasoline, diesel	LUST: cleanup started 1/9/1999, UST: 2 tanks removed, 2 tanks operational
^a Distance from Safeco Field which is located close to the center of the project footprint. ^b Indicates information obtained from WSDOT, 1996. All other information was obtained from EDR, March 12, 2007 (Appendix A).							



Note: See Exhibit 4-3 for information on each numbered site. Some sites listed by EDR have two addresses, resulting in two points with the same ID.

Source: EDR (2007), City of Seattle (2007), and WSDOT (1996)

Exhibit 4-4
Locations of Other Sites of Concern Listed
on Regulatory Agency Databases
near the SR 519 Atlantic
Access Corridor

- Other Sites
- Project



Exhibits 4-1 and 4-3 present detailed information about the listed sites, as provided by EDR, including contaminated media, types of contaminants, and cleanup status, as applicable. Business names are reported as they appear in the database search results and might not reflect current ownership or operation

4 What are the results of the previous environmental investigations conducted within the study area?

Several previous studies were performed for earlier phases of the project, encompassing parts of the current study area. The results of those studies are summarized below.

SR 519 Intermodal Access Project Right of Way Preliminary Site Investigation Sampling and Analysis Plan (WSDOT, 1997). Forty-four soil probes were drilled on Fourth Avenue South, South Atlantic Street, and Third Avenue South. Benzene, polycyclic aromatic hydrocarbons (PAHs), total petroleum hydrocarbons (TPH) - oil range, and trichloroethylene were detected at concentrations above the MTCA Method A cleanup levels. All of the samples with detections above cleanup levels were located inside or within 250 feet of the study area.

Discipline Report for the Kingdome Intermodal Access Project (WSDOT, 1996). The Kingdome report concluded that it was highly probable that contamination would be encountered in the study area. Known contamination sites are widespread and could be quite extensive, especially in the Kingdome neighborhood.

Hazardous Materials Discipline Report for SR 519 Surface Street Improvements (HWA GeoSciences Inc., 2004). This report concluded that soils and groundwater contaminated with diesel and oil range petroleum hydrocarbons, semi-volatile organic compounds (SVOCs), and heavy metals are likely to be present throughout the study area.

MTCA Method A cleanup levels are protective of human health for the most common hazardous substances found in soil and groundwater.

MTCA Method B is used to set cleanup levels when sites are contaminated with substances not listed under Method A. Sites cleaned up to Method B cleanup levels generally do not need future restrictions on the use of the property due to the small amount of residual contamination typically left on the property.

5 What are the results of the Ecology file review?

The project team reviewed information about sites identified by the regulatory agency database search located within 1/4 mile of the intersection of Fourth Avenue South and South Royal Brougham Way, including the intersection of First Avenue South and South Atlantic Street. This information was collected because environmental conditions at sites within 1/4 mile of the project are more likely to result in possible effects on the project than those located at a greater distance. Site file information was reviewed at the Ecology Northwest Regional Office in Bellevue, Washington. Files were not available for all sites. Each file was reviewed for the following:

- Enforcement actions in the last 5 years
- Confirmed or suspected contaminated media
- Confirmed or suspected contaminants
- Cleanup status

The information found in the Ecology files is summarized below.

Northwest EnviroServices, Inc. (1500 to 1700 Airport Way South) (Map ID U112-U113)

Northwest EnviroServices is a former hazardous waste treatment, storage, and disposal (TSD) facility. A RCRA facility investigation report was prepared in April 2004 for Northwest EnviroServices (CH2M HILL, 2004). The report indicated that MTCA Method B cleanup levels were exceeded for benzene, vinyl chloride, lead, TPH, arsenic, and two PAH compounds (benzo(a)anthracene and benzo(a)fluoranthene). The MTCA Method B cleanup levels for the protection of groundwater were exceeded for gasoline, methylene chloride, bis(2-ethylhexyl)phthalate, PAHs, metals (antimony, arsenic, barium, cadmium, and selenium) and cyanide.

In addition, Northwest EnviroServices has a quarterly groundwater monitoring program to meet requirements of 40 CFR 265.93(d)(4). The October 16, 2006, results showed benzene and lead concentrations exceeded maximum

contaminant levels for drinking water standards (CH2M HILL, 2007).

Leavitt Shay (1217 Sixth Avenue South) (Map ID M60-M61)

Leavitt Shay Real Estate was partner with Clise Properties, Inc., on an industrial building located at 1217 Sixth Avenue South. The building had a history of petroleum contamination. According to a site characterization and final cleanup report (Dames & Moore, 1995), a leaking UST was removed from the site along with 52 yards of soil that was contaminated with diesel fuel. The report concluded that if hydrocarbon-containing soils are still present, the volume and extent are relatively limited and should not pose a substantial threat to human health or the environment. Findings were limited by samples taken at a depth of 14.5 feet and samples were taken only from the soil surrounding the tank, where petroleum hydrocarbons were most likely to be detected if present.

Metro Ryerson Operating Base (1220 Fourth Avenue South) (Map ID D15-D16)

Metro Transit opened its Ryerson bus operation and maintenance facility in 1987 after the Mercer Bus Base closed. The final UST site assessment report (Black & Veatch, 1996) reported that the Fuel Module Tanks Area did not have soil or water samples that exceeded the MTCA Method A cleanup standards for petroleum hydrocarbons in the diesel and heavy oil range. Soil and groundwater samples taken from the Waste Oil Tanks Area exceeded the MTCA Method A cleanup standards for petroleum hydrocarbons in the diesel and heavy oil range. An estimated 143 cubic yards of soil and 25,000 gallons of groundwater required treatment.

In April 1998 the *Final Ryerson Operating Base Site Assessment Addendum* was Prepared for King County DOT Transit Division (Black & Veatch, 1998). In the Waste Oil Tank Area there was TPH-contaminated soil and groundwater with concentrations above MTCA Method A cleanup levels. Black & Veatch recommended monitoring groundwater and removing the contaminated soil if the overlying structures are removed. TPH-contaminated soil was removed from the Fuel Module

Area and groundwater was treated and removed. TPH levels in groundwater after cleanup were below MTCA Method A cleanup levels.

On June 10, 2003, Ecology issued a No Further Action (NFA), noting that there was a small amount of TPH-oil remaining onsite. Ecology determined that soil and groundwater at the site no longer pose a threat to human health and/or the environment (O'Brien, 2003).

Romaine Electric (1101 South Airport Way) (Map ID P90-P91)

Romaine Electric distributes alternators and starter components to a variety of industries including military, automotive, and marine. ETI prepared a UST site re-assessment report (ETI, 1998) which indicated that lead contaminant concentrations in perched groundwater and soil samples exceed MTCA Method A action levels. Petroleum and heavy oil contaminant concentrations exceeding MTCA Method A cleanup levels were discovered in soil samples.

On August 12, 1999, Ecology issued a NFA letter stating that the release of petroleum hydrocarbons and lead into the soil and shallow groundwater no longer pose a threat to human health or the environment (Lillie, 1999).

Major League Stadium Public Facility (Third Avenue South and South Royal Brougham Way) (Map ID 3)

The Major League Stadium Public Facility operates Safeco Field. Supplemental soil sampling and analysis conducted in 1997 by Hart Crowser revealed soils contaminated with heavier oil-range hydrocarbons that exceeded MTCA Method A cleanup levels along the north side-wall. The soils could not be removed because of adjacent utilities along South Royal Brougham Way (Hart Crowser, 1997).

City of Seattle, Ken Station (1030 Seventh Avenue South) (Map ID 108)

Ken Station is a fuel depot operated by the City of Seattle. SCS Engineers submitted a request of NFA March 30, 2001, reporting that they had achieved the primary cleanup goals that were established in the 1997 Cleanup Action Plan.

Groundwater contaminants of concern were below MTCA Method A cleanup levels and all except 450 cubic yards of contaminated soil was removed. The remaining soil was paved over (Venchiarutti, 2001).

Uwajimaya Village (514 and 524 Dearborn Street) (Map ID O89-O93)

Uwajimaya Village is currently a small international shopping center composed of restaurants, small businesses, apartments and a large Asian grocery store. In December 1999, Hart Crowser reported that there were no detectable concentrations of TPH or related benzene, toluene, ethylbenzene, xylene (BTEX) constituents in soil samples collected from soil excavated 20 to 23 feet below ground level. Sampling was conducted to determine the limits of hydrocarbon contamination from a former gasoline station located at the site (Hart Crowser, 1999).

City of Seattle, Charles St. West (705 South Charles Street) (Map ID W115-W116, 108)

The City of Seattle currently maintains a transportation maintenance facility at the Charles Street West location. SCS Engineers prepared an Interim Investigations Report in December 1991, finding groundwater and soil contamination concentrations that exceeded MTCA Method A cleanup levels (Berry, 1991).

SCS Engineers prepared a site characterization report dated June 20, 1995. The document contained information about three sites:

- 705 Charles Street (Sump at Service Truck Parking Area)
- 814 Eighth Avenue South (Former USTs at Car Wash)
- 1030 Seventh Avenue South (Former USTs at New Fueling Facility)

Soil sample contamination concentrations exceeded MTCA Method A Cleanup Levels at 705 Charles Street. Since contamination appeared to be a localized plume of diesel and aged gasoline, routine seasonal groundwater monitoring was recommended to evaluate the need for remediation.

At 814 Eighth Avenue South, SCS Engineers recommended further treatment of contaminated soil since petroleum hydrocarbons were detected above MTCA Method A cleanup levels.

Findings at 1030 Seventh Avenue South indicated the presence of a narrow plume of groundwater and soil contamination. Further delineation of the contamination is necessary to evaluate possible remediation, continued monitoring, no action, or performance of a risk assessment (SCS Engineers, 1995).

**Music-Vend Distributing Co. (1550 Fourth Avenue South)
(Map ID E29 & I47)**

Music-Vend Distributing currently operates music and vending machines in Seattle and had several USTs that contained gasoline and other petroleum compounds. EAI issued a UST removal and independent cleanup action report (EAI, 2004) stating that the independent cleanup action achieved compliance with Ecology's MTCA (WAC 173-340). EAI recommended installing groundwater monitoring wells and implementing a groundwater monitoring program, removing a UST subsequent to scheduled demolition of an overlying building and then testing the soil, and further investigating to identify the source of diesel contaminant concentrations in the groundwater that exceeded Ecology's target compliance level.

The following information was derived from a document entitled "Former Music-Vend – Environmental Exploration History – Time Line" prepared by EAI in January of 2005:

In October 2004 the building was demolished, contaminated soil was removed and a third UST didn't exist. Soil samples collected were in compliance with Ecology target levels. In January 2005 three groundwater monitoring wells were installed and diesel and/or heavy oil concentrations were found above Ecology action levels.

Ecology sent a letter notifying Music-Vend that further remedial action is necessary (Madakor, 2006a) and a letter

notifying Music-Vend that Ecology was removing the site from the VCP (Madakor, 2006b).

Shell Gas Station (Sixth Avenue South and South Dearborn Street) (Map ID O88)

Shell operates a gas station and convenience store at the intersection of Sixth Avenue South and South Dearborn Street. EMCON prepared a report (EMCON, 1996) providing results of remediation and requesting an NFA. EMCON reported that the site qualified for an NFA on the basis that excavation was performed to the extent practical, soil meets Method A Cleanup Levels except for a few locations, and groundwater met cleanup action levels except for a localized area. Benzene and TPH-G concentrations were detected in groundwater only slightly higher than cleanup levels in October 1995.

Noll Environmental, Inc. (NEI) wrote a letter in 1998 summarizing their investigation, the site's history, and findings from previous reports. The purpose of NEI's investigation was related to the installation of a new onsite sewer utility associated with the convenience store renovation. During the investigation, NEI found TPH-O (oil range organics) in soil samples at concentrations that exceeded the MTCA Method A Cleanup Levels. The soil excavated from the sewer trench was replaced with clean fill since it was affected with petroleum hydrocarbons (Marshall-Noll, 1998).

Other Sites

No records were on file at the Ecology Northwest Regional Office for the following sites. Available information from EDR database search report is provided below:

- Kingdome-South Parking Lot at King Street and Second Avenue South (Map ID 25), at Seattle Tide Lands, a UST site
- Atkinson Dillingham (Map ID 43), at 500 South Royal Brougham Way, a RCRA-SQG, FINDS site
- WA DOT (Map ID D21), at 1214 Fourth Avenue South, a LUST, UST site, which is also the location of the Metro King County Transit Base

- Pacific Fish Company (Map ID 107), at 617 South Dearborn, a UST, LUST site
- Saybolt Inc., Seattle (Map ID D12), at 1225 Fourth Avenue South, a RCRA, FINDS site with no violations found
- WDOT (Map ID D20), at 1213 Fourth Avenue South, a UST site (Ecology databases have used WDOT to refer WSDOT)
- WA DOT (Map ID D21), at 1214 Fourth Avenue South, a UST, LUST site (Ecology databases have used WA DOT to refer to WSDOT)

No files were available at Ecology for Historical Auto Stations or Historical Cleaner sites.

6 What are the results of the historical record review?

The project team reviewed historical records for potential hazardous materials sites within the study area, including historical land use maps, Sanborn fire insurance maps, Polk directories, and aerial photographs. Historical Sanborn maps contain information about all recorded businesses and property improvements, including equipment with a potential to release contaminants to the environment such as fuel storage tanks. Polk directories contain a list of businesses according to street address for a given year. Aerial photographs were used to identify businesses that often have a history of releases (such as gas stations and rail yards) and storage tanks.

The following sources were reviewed to identify historic uses of properties in the study area commonly associated with generation, storage, or transportation of hazardous materials:

- Historical Sanborn Maps (1904, 1916, 1950, 1969)
- Polk directories (1893, 1905, 1920, 1930, 1936, 1943-44, 1955, and 1965)
- Historic topographic maps (1897, 1909, 1949, 1968, 1973, and 1983)

- Historic aerial photographs (1956, 1965, 1977, 1985, 1990, and 2007)

Some of the above historical data sources were also reviewed by Washington State Department of Transportation Environmental Affairs Office and HWA GeoSciences. Their findings were summarized in the *Kingdome Area Intermodal Access Project, Final Hazardous Waste Report*, the *SR 519 Surface Street Improvements, Seattle Washington, Hazardous Materials Discipline Report* and the *SR 519 Intermodal Access Project, Right of Way Preliminary Site Investigation Sampling Analysis Plan*. Where applicable, information presented in these reports is excerpted and summarized below. Applicable sections from these reports are in Appendix B.

Sanborn Maps

The Sanborn maps contain information used to identify historic businesses by name, location, and unique concerns for insurance underwriters, such as large fuel tanks and chemical hazards.

The maps show that a wide variety of businesses and operations occupied the study area during the last 100 years. Some operations are likely environmentally benign, including dry goods and clothing stores, warehouses, and construction supply companies. The Sanborn maps also show environmentally suspect operations including machine shops, railroad locomotive fueling and repair stations, gasoline stations, and automotive junkyards (HWA, 2004). A summary of the suspect sites is presented in Exhibit 4-5. These sites are located near the project construction and potentially have historical releases into soil or groundwater that could affect or be affected by the project.

Polk Directories

Polk city directories identify businesses by name, type of business, and address. In a report prepared by HWA for WSDOT, previously published Polk city directory information was reviewed to evaluate whether environmentally suspect businesses have historically operated in the study area (HWA, 2004).

EXHIBIT 4-5. SANBORN MAP INFORMATION		
Year	Name	Location
1916, 1950, 1969	Great Northern RR	South Atlantic and Occidental
1916, 1950	Railroad tracks	West of Fourth Avenue South
1916, 1950	Railroad tracks	West of Fourth Avenue South
1916	Chicago and Milwaukee Freight Depot	South Atlantic Street and First Avenue South

The report identified at least 36 suspect businesses listed in the directories that are in or adjacent to the study area, including 4 suspect businesses shown on historical Sanborn maps.

Environmentally suspect businesses identified included gasoline service stations, printers, paint manufacturers, machine shops, asbestos supply, and boiler works. Sites of environmental concern within or adjacent to the study area are listed below in Exhibit 4-6. This list was derived from a list of businesses that was found in Polk directories, as prepared by HWA (HWA, 2004).

Aerial Photographs

Historical aerial photographs of the study area were reviewed for 1956, 1965, 1977, 1985, and 1990. Observations were compared with the observations reported in the 2004 WSDOT report for photos taken the same years. Copies of the aerial photographs are included in Appendix A.

1956 Photograph

This photo shows that the study area is already highly industrialized. Many streets are developed, but freeways (I-90 and I-5) and ramp structures for freeway access are not present. Railroad yards, parking lots, and industrial/commercial buildings occupy the study area.

1965 Photograph

Most of the buildings observed in the 1956 photo are present in 1965. The I-5 overpass and ramp structures are partially constructed over Dearborn Street. There are a few new buildings within the study area, including a warehouse with

paved parking located northwest of the intersection of Utah Avenue South and South Atlantic Street.

EXHIBIT 4-6. POLK DIRECTORY LISTINGS		
Year	Name	Address
1893	Moran Brothers	South Dearborn and 1st Avenue South
1904	Standard Boiler Works	1015 1st Avenue South
1905	Great Western Smelting	1237 1st Avenue South
1905	Finn Metal Works	1255 1st Avenue South
1905	NW Iron Works	1041 Railroad Avenue South
1905	Pacific Coast Co.	Railroad and Dearborn
1905	Western Machinery	1000 Railroad Avenue South
1920	Jordan Terminal Inc	1250 1st Avenue South
1920	Alaska Junk Co.	1231 1st Avenue South
1930	Seattle and Co.	1220 1st Avenue South
1930	Gas Station	1121 1st Avenue South
1936	Asbestos Supply Co.	1061 1st Avenue South
1936	Ellis Auto Repair	1255 Railroad Avenue South
1936	Century Electric Co.	1518 1st Avenue South
1936	General Electric Supply Co.	1212 1st Avenue South
1936	Kohl and Kohl Gas Station	1203 Railroad Avenue South
1936	Van Arnam Service Station	965 Railroad Avenue South
1936	Olympic Reprographics	1016 1st Avenue South
1936, 1943-1944	American Radiator Co.	1534 1st Avenue South
1936, 1943-1944	Alaska Auto Wrecking Co.	1548 1st Avenue South
1936, 1955	Westinghouse Supply	1051 1st Avenue South
1943	Goodrich Co.	1224 1st Avenue South
1943	Bloch Junk Dealer	1230-1232 1st Avenue South
1950	International Harvester Co.	1251 1st Avenue South
1950	Auto Repair	1542 Occidental Avenue
1965	Valvoline Oil Co.	1228 Occidental Avenue South
Source: HWA, 2004.		

1977 Photograph

The study area remains largely unchanged from 1965 and is largely industrial in land use. The Kingdome stadium appears in this photograph. South Royal Brougham Way is now

continuous from Alaskan Way to the developed I-5 and I-90 freeways with ramps that are just east of the intersection of Airport Way South and South Royal Brougham Way.

1985 Photograph

There are few changes from the 1977 photo. The land is vacant directly south of South Royal Brougham Way, at the present-day Safeco Field. This area was occupied by railroad yards and a few buildings in the 1965 photo. Fill has replaced several docks along the Puget Sound shoreline, west of the study area between South Atlantic Street and South Jackson Street.

1990 Photograph

Most of the prominent buildings viewable in the 1985 photo are visible in the 1990 photograph. The I-90 express lane appears and there are freeway ramps over Airport Way South connecting to South Royal Brougham Way. A small stadium occupies the previously vacant land that lies south of South Royal Brougham Way.

HWA reported that they did not observe any evidence of earthwork, large above-ground storage tanks, lagoons, landfills, or other surface features typically associated with environmental contamination within the study area that are visible in aerial photographs. The main features of environmental concern observed in the photographs and reported by HWA include a bulk fuel terminal, railroad tracks, siding yards, and earthen fill.

2007 Photograph

The on-ramp to eastbound I-90 from South Atlantic Street and the I-90 off-ramp onto Fourth Avenue South appear in this photo. Buildings have been removed to make way for the ramps. A large structure, Qwest Field Event Center, occupies the previously vacant land between Qwest Field and Safeco Field.

Topographic Maps

The topographic maps support the findings associated with review of the aerial photographs. Topographic maps of the study area were reviewed for 1897, 1909, 1949, 1968, 1973, and 1983. Observations were compared with the observations

reported in the 2004 HWA report for maps of the same years. Copies of the topographic maps are included in Appendix A.

1897 Topographic Map

Observations that can be made from viewing this map are limited by the scale of the map (1:125,000). Dense street grid covers the landscape along the Elliott Bay shoreline, diminishing about half way to the west shore of Lake Washington. Based on the street density, the study area appears to be industrial in 1897.

1909 Topographic Map

Many details of the study area are obscured due to the scale of this map (1:62,500). Further industrial development is apparent from the dense street grid that covers the landscape from the shoreline of Elliott Bay to the west shore of Lake Washington. Docks are visible along the Elliott Bay shoreline.

1949 Topographic Map

Railroad yards occupy the center of the study area with commercial/industrial buildings along the east and west boundaries. Airport Way South, Fourth Avenue South, First Avenue South, and Alaskan Way are the major streets at that time, with no freeways present.

1968 Topographic Map

Evident land use changes within the study area are limited. I-5 is on this map with a ramp that appears to connect with Airport Way South, but there are no other obvious changes.

1973 Topographic Map

Railroad yards are cleared out of the block where the present-day Qwest Field is located. No other changes in the study area are evident.

1983 Topographic Map

The Kingdome stadium is shown and South Royal Brougham Way is marked as a major road, continuous from the Alaskan Way Viaduct through Airport Way, appearing to connect with I-5 freeway ramps.

7 What are the results of the visual reconnaissance?

The project team conducted a windshield reconnaissance survey of the project study area on May 14, 2007. The observations are generally consistent with the records reviewed; observations are discussed below. Photographs of the visual reconnaissance are included in Appendix C.

Fourth Avenue South and South Royal Brougham Way

The properties adjacent to the project footprint west of Fourth Avenue South are primarily used for sporting events. Qwest Field, used by the Seattle Seahawks football team, and Safeco Field, used by the Seattle Mariners baseball team, are located north and south of South Royal Brougham Way. King County Metro Transit maintains a bus terminal (Ryerson Base) to the east of Fourth Avenue South. BNSF Railway has several railroad tracks that run north/south just west of Fourth Avenue South. There are numerous active tracks located between Fourth Avenue South and Safeco Field.

Interstate 90 runs east/west above South Royal Brougham Way to the east of Fourth Avenue South. There are several retail and industrial businesses located on the east side of Fourth Avenue South and north of South Royal Brougham Way, including the Salvation Army, Turner Construction, and a parking garage. There is an elevated road above Fifth Avenue South on the north side of South Royal Brougham Way. There are no businesses located beneath it. There are several businesses located on Sixth Avenue South on the north side of South Royal Brougham Way, including Romaine Electric and Popich.

First Avenue South and South Atlantic Street

Safeco Field is located on the northeast side of the intersection of First Avenue South and South Atlantic Street. Great Floors is located on the northwest side of the intersection and Pyramid Brewery is located north of Great Floors on First Avenue South and across from Safeco Field. There are parking lots on the southeast and southwest sides of First Avenue South and South Atlantic Street. Small areas of each of these parking lots along South Atlantic Street would be acquired by WSDOT for

construction. On the southwest side, besides the parking lot there are several 2- to 3-story buildings that house smaller businesses including Bogart Golf, Queen Anne Window and Door, and Canine Club.

8 What are the hazardous materials and contaminated sites of concern in the project study area?

The study area contains hazardous materials management, hazardous waste management, and confirmed or suspected contaminated environmental media sites. The following sections provide more information about the analysis and discuss the identified sites of concern. The sites are divided into two categories: sites of concern and all other sites.

Sites of Concern

Sites of concern were selected based on the criteria summarized below:

- The site possesses a potential for substantial contamination of environmental media (i.e., soil, and groundwater).
- The site contains contaminants that are persistent or expensive to manage.
- There is not enough information about the site to predict remedial costs.
- Historical information about the site is lacking.

Based on the above criteria, 24 sites are considered as sites of concern and are briefly described below. Exhibit 4-1 lists all of the sites and they are shown on a map in Exhibit 4-2.

Known Hazardous Material Locations

The **Metro King County DOT Transit site** and **WSDOT site** are co-located at 1213 and 1220 Fourth Avenue South (D16 and D20), which is across the street from the proposed grade separation on South Royal Brougham Way and below the proposed off-ramp from SR 519 to South Atlantic Street. There have been a variety of contaminants in the soil and groundwater, including anti-freeze, new and used petroleum

products, and gasoline. At least 11 LUST tanks were removed in the 1990s and an ICR was received by Ecology in 2002. Even though the historical record indicates the site has been remediated, because of close proximity to the study area on Fourth Avenue South and South Royal Brougham Way, the site at 1213 and 1220 Fourth Avenue South was included as a site of concern.

Northwest EnviroServices, 1500 to 1700 Airport Way (U112) is currently performing groundwater monitoring for historical contamination, has had 72 RCRA violations in total (including generator-general, generator recordkeeping, TSD-groundwater monitoring, TSD-preparedness/prevention, TSD-containers, TSD-general standards, TSD-financial responsibility, TSD-closure/post-closure, TSD-tanks, TSD-contingency plan, and TSD-other requirements), and is currently listed under RCRA's Corrective Action Activity (CORRACTS). The types of contaminants are well known and sources of the contaminants have been removed.

Music-Vend Distributing at 1550 Fourth Avenue South (E29 and I47) is listed because of inconsistencies between Ecology and historical records. In the Ecology records, it was recommended that one of the USTs be removed and a Notice of Further Action was issued by Ecology in June 2006. However, the record also stated that no cleanup work had been performed in the previous 12 months. It is unknown whether the UST has been removed.

Major League Stadium Public Facilities (3) at Third Avenue South and South Royal Brougham Way is listed because a LUST and associated contaminated soil were remediated in 1997. The location is proposed for construction and might have additional contaminated soil that was not remediated.

Coast Crane Co. (B9-B10) at 1531 Utah Avenue South is located near the proposed construction for First Avenue South and South Atlantic Street. Several LUSTs were removed along with affected soils in 2005. The location is near the area proposed for construction and might have residual contaminated soil.

Mobile SRV Brakes (B9-B10) at 1728 Fourth Avenue South is located near the proposed construction for First Avenue South and South Atlantic Street. Mobile SRV Brakes is CSCSL and VCP listed for petroleum and non-halogenated solvents contamination to soil and groundwater. Ecology has not issued an NFA according to EDR. The location is near the area proposed for construction and might have residual contaminated soil and/or groundwater that could affect the study area.

Suspected Hazardous Material Locations

Spic N Span Cleaners, 652 Dearborn Street (111), received an NFA for remediation of soil and groundwater associated with halogenated organics and petroleum products. Spic N Span is currently listed as an inactive dry cleaner and also as a small quantity generator under RCRA.

Numerous locations within the study area had LUSTs and contaminated soil and issued interim cleanup reports including:

- Union Pacific Railroad (G45) at 801 First Avenue South
- Leavitt Shay Industrial Building (M60) at 1217 Sixth Avenue South
- Shell Gas Station (O68-O88) at 511 South Dearborn Street
- Maust Terminal (R96) at 1762 Sixth Avenue South
- Pacific Fish Company (107) at South Dearborn Street

The databases reviewed concluded that leaking tanks were removed from each of these sites and some degree of remediation of contaminated soil was managed. It is possible that there is some remnant contamination in the soil that could affect the study area.

The City of Seattle or King County has several historical sites including:

- City of Seattle - Ken Station (108) at 1030 Seventh Avenue South

- Metro Atlantic Operating Base (U109) at 1555 Airport Way South
- City of Seattle - Charles Street South (W115-W116) at 705 South Charles Street

Each of these sites had petroleum releases from LUSTs that have been removed and the affected soil removed. It is possible there are some residual contaminated soils that could affect the study area.

Seattle City Light (24) at 1555 Utah Avenue South had soil contaminated with PCBs.

Industrial Rebuild (H44) at 1714 First Avenue South had several small generator violations.

There is very little information available for H. Kohlstamm and Co. at 1016 First Avenue South (C23). The only information that was found for the business was the EDR record which listed the site as a historical cleaner. Because of the historical operating practices of cleaners, particularly dry cleaners, and the close proximity to the study area, this site was listed as a site of concern.

There are five sites (32-WSDOT, 40, 262, 265, and 266) for which there is very little information available. They were identified as sites of interest in the WSDOT and HWA reports but the EDR record search did not find any of the sites in any of the databases reviewed. However, since they are near the study area, they were listed as sites of concern.

Broad Hazardous Material Areas

There have been numerous railroad yards and rail lines around Fourth Avenue South and South Royal Brougham Way.

Railroad yards are typically associated with a variety of contaminants including petroleum products/fuel, polycyclic aromatic hydrocarbons, metals (arsenic, lead, chromium, and others), herbicides (used to keep tracks clear of vegetation), and chlorinated solvents (from maintenance activities).

According to the Sanborn maps, there was a railroad freight depot located at the southwest intersection of First Avenue South and South Atlantic Street. No other information was

found regarding the machine shop in the other databases that were reviewed. Due to the nature of business of a machine shop and the fact that WSDOT is going to acquire a portion of the property on the southeast and southwest side of the intersection, some additional investigation is warranted.

Properties to be Acquired

Portions of three properties listed as sites of concern in Exhibit 4-1 would be acquired for the Proposed Action: 1220 Fourth Avenue South (A), 1213 Fourth Avenue South (B), and the intersection of Third Avenue South and South Royal Brougham Way (E). These sites are described in greater detail in Exhibit 4-1, and their approximate locations are shown on Exhibit 4-2.

Chapter 5 Environmental Consequences and Mitigation Measures

1 What would the construction effects of the project be?

Proposed Action

Effects during construction are considered short-term in comparison to the life-span of the completed project. Construction of the Proposed Action is expected to last approximately 3 years beginning in 2009. Most of the construction effects would end when construction is complete. The potential construction effects related to the Proposed Action are discussed below.

Contaminated Environmental Media

Contaminated environmental media including soil and groundwater are highly likely to be encountered during the construction of the SR 519 Atlantic Access Corridor, as a result of activities associated with the railroad lines located adjacent to the project footprint and the other industrial sites.

There are 24 sites of concern located near or within the study area that could affect or be affected by construction activities. As part of construction, it is possible that the remedial cleanup of sites within the study area might be accelerated by the removal of contaminated soil and groundwater encountered. However, the Proposed Action might also alter groundwater pathways and thereby spread existing contaminants. Under this scenario, the foundations may need to be cased in the water-bearing zones to prevent groundwater from entering the foundation hole and flowing down the shaft.

Underground Storage Tanks

Currently, there are no known USTs within the project construction area. Although extensive excavation is not planned as part of the project, it is possible that construction equipment or new foundations could encounter previously

unidentified USTs and their associated piping. Unknown USTs create the greatest risk to the project because of the explosion hazard and the potential to create a spill if the tank is ruptured. Vapors trapped within the tank could reach explosive limits and cause an explosion if ignited by a spark or some other incendiary source, like a cigarette.

Hazardous Materials Spills

Another potential construction effect of the Proposed Action would be the accidental release of a hazardous substance during construction. For example, fuels and lubricants needed for heavy equipment operation and maintenance could be spilled. This is a hazard common to all construction projects. Cleaning up material and disposing of it could add more time and costs to construction operations. Large spills of hazardous materials during construction could also require emergency response agency intervention.

Worker Safety and Public Health

Construction workers and the public could be exposed to hazardous materials uncovered, released, or spilled during construction. Workers would be more at risk than the public because of their proximity to spills during construction operations. The most likely spill materials that a worker would be exposed to are petroleum-based products such as fuels and hydraulic fluids. The common routes of exposure are inhalation, ingestion, and skin contact. Petroleum products could cause damage to the eyes, exposed skin, or lungs. Use of appropriate personal protective equipment and proper hygiene would reduce the risk of exposure. Workers would also receive proper training in the use of spill prevention materials and standard procedures in the event of a spill of unknown material.

Public health effects from construction would be related to exposure to a release of hazardous materials. A spill of materials brought onsite or encountered during construction, including dust, could expose the public to hazardous substances that pose a health risk. The most likely type of spill material that could be released would be petroleum-based

products, such as fuels and lubricants. The product could be released to the soil, surface water, groundwater, or air. The most likely routes of exposure to the public would be through inhalation and direct contact. The greatest danger here would be a release of unidentified contaminants. Careful work would prevent a release that might otherwise endanger the public.

The overall effects of a release on the public would include illness and discomfort from exposure to the hazardous substance, and could also include lost wages for those exposed or health care costs to treat the symptoms of the exposure.

No Build Alternative

The No Build Alternative would not affect the presence of contaminated soil or groundwater within or near the study area.

The hazardous material sites would remain in place due to no construction activities. The potential exists for the migration of existing contaminants to continue.

If the construction does not proceed, there would still be an increase in the amount of traffic from the Seattle's waterfront, including from the ferries, container trucks, and personal vehicles. In addition, there are plans to increase the amount of rail traffic and to construct Sound Transit's light rail system. The increased vehicle and rail traffic would also increase the risks to public health because of the greater likelihood of accidents between pedestrians, personal vehicles, and commercial traffic.

2 What hazardous material effects would occur during operation of the project?

Proposed Action

The potential for hazardous material spills from transport trucks would be reduced as a result of the improved traffic flow because there would be less congestion and fewer corners that would have to be negotiated by the transport trucks. No mitigation measures would be required for these operational effects.

Property acquisition associated with the Proposed Action would most likely include six small areas totaling approximately 5,415 square feet. The historical records review indicated that these properties all have the potential for being contaminated because of the history of hazardous material releases in the study area. In particular, three properties warrant further investigation before they are acquired:

- The portion of land required for construction at the King County Metro Transit/WSDOT facility on 1213-1220 Fourth Avenue South (Ryerson bus base).
- The area adjacent to the railroad lines (west, north, and on Third Avenue South) within the study area.
- The west and east sides of the railroad lines located to the west of Third Avenue South and between South Royal Brougham Way and South Atlantic Street, including a small parcel of land to be acquired that is located to the west of Third Avenue South, north of South Royal Brougham Way, and north of South Atlantic Street.
- The southeast side of the intersection of First Avenue South and South Atlantic Street. There was a machine shop located on the southwest corner of this intersection. Although no contamination has been recorded at this location, no investigations are known to have been conducted there. Investigation is warranted because of the type of business that previously operated at this intersection.

Property acquisition terms have not been finalized. To avoid liability, WSDOT could perform “all appropriate inquiry” as required under Section 101(35)(B)(ii) and (iii) of CERCLA prior to obtaining potentially contaminated property. If the inquiry identified actual soil and/or groundwater contamination, WSDOT could negotiate a price for the property reduced by an amount equal to the estimated cost of remediating the contamination.

No Build Alternative

The potential for hazardous material spills from transport trucks would likely increase as a result of the No Build Alternative. Traffic would continue to increase and the proposed improvements would not be implemented; therefore, there would be the potential for increased pedestrian and vehicular collisions.

There would be no property acquisition associated with the Proposed Action under the No Build Alternative.

3 What are the cost estimates for further investigation?

As previously noted, three sites within the study area warrant further investigation:

- The portion of land required for construction at the King County Metro Transit/WSDOT facility on 1213-1220 Fourth Avenue South (Ryerson bus base).
- The area adjacent to the railroad lines (west, north, and on Third Avenue South) within the study area.
- The southeast side of the intersection of First Avenue South and South Atlantic Street. There was a machine shop located on the southwest corner of this intersection. Although no contamination has been recorded at this location, no investigations are known to have been conducted there. Investigation is warranted because of the type of business that previously operated at this intersection.

According to the record review, there have been numerous spills at the Metro Transit site and numerous LUSTS were removed in the mid 1990s. Although there are no ongoing or planned remediation activities at the site, soil and groundwater contamination might be encountered during excavation for the bridge foundations because of the numerous spills that have occurred there in the past.

Railroad yards like the one near Third Avenue South historically have had contamination in the form of fuels and

lubricants, herbicides, solvents, and metals. During construction, it is possible that contaminated media will be encountered adjacent to the railroad.

Although there is no history of contamination, there was a railroad freight depot on the west side of First Avenue South that could have been a source of hazardous materials and contamination may have migrated to the east. No samples were collected during the site investigations associated with Phase 1 of the SR 519 Intermodal Access Project.

Three options for managing contaminated media in the study area have been identified and are discussed below. The recommended option includes input from all parties, including the design team and WSDOT.

Option 1. Conduct Environmental Site Investigation

The first and recommended option is to conduct an environmental site investigation to determine if contaminated soils would likely be encountered during construction of the SR 519 ramp structures, particularly with the bridge foundations. This would likely consist of collecting soil and possibly groundwater samples in the area proposed for construction including those to be acquired. If the analytical results confirmed the presence of contaminated soil, a contaminated soil and groundwater management plan could be prepared prior to construction (discussed below in question 5).

As part of the investigation, a geophysical survey of the project vicinity could be conducted to help identify former USTs and pipelines that were not previously identified. Should the investigation not be performed, there would be two options for managing the potential contamination: “Preplanning” or “No Preplanning.”

Option 2. Preplanning

Preplanning for managing contaminated media such as soil or groundwater would consist of:

- Developing a contingency plan for managing each type of media, which would include but not be limited to

excavation, hauling, disposal plans, sampling and analysis plans, decontamination areas, and access restrictions

- Having staff available that are trained in dealing with hazardous media, which includes Hazardous Waste Operation (HAZWOPER) training and respirator certification
- Having equipment mobilized that can assist in managing hazardous media
- Having vendors or subcontractors and contracts in place for managing hazardous media

Option 3. No Preplanning

Under the “No Preplanning” option, there would be no prior preparation for handling hazardous media.

This option is not considered a viable option but it is presented to describe some of the potential effects if there is no preplanning done in anticipation of encountering contaminated soil during construction.

The up-front costs for this option would be zero; however, if contaminated soils were encountered, the cost for managing the contaminated media would likely be much greater than the cost incurred if the preplan option was selected, because construction equipment and staff would likely be idle while a plan for managing the contaminated media was devised and implemented. The other issues associated with this option are worker safety if contamination is found and the delay in the construction schedule while the contamination is managed. . An estimate of the amount the schedule would slide is very difficult to develop since the location and extent of contamination is not known.

Cost estimates for conducting each option are presented in Exhibit 5-1.

EXHIBIT 5-1. COST ESTIMATES FOR FURTHER INVESTIGATION OPTIONS			
Site Location (Relevant Map ID shown in parentheses)	Parties	Recommended Activities	Estimated Cost
All Options			
Third Avenue South and South Royal Brougham Way, Ryerson Base (A,B), and parcel west of RR tracks (E)	King County Metro Transit WSDOT BNSF Railway WA State Major League	Discussions with King County, WSDOT, BNSF, WA State Major League	\$3,000
Option 1			
Third Avenue South and South Royal Brougham Way, Ryerson Base (A,B), and parcel west of RR tracks (E)	King County Metro Transit WSDOT BNSF Railway WA State Major League	Site Investigation ^a	\$50,000
		Contaminated Media Management Plan ^b	\$20,000
		Geophysical Survey	\$3,000 to \$10,000
Total Estimated Cost – Option 1			\$76,000 to \$83,000
Option 2			
Third Avenue South and South Royal Brougham Way, Ryerson Base (A,B), and parcel west of RR tracks (E)	King County Metro Transit WSDOT BNSF Railway WA State Major League Landowner	Preplanning (contingency plan and contracts)	\$20,000
Total Estimated Cost – Option 2			\$23,000
Option 3			
Third Avenue South and South Royal Brougham Way, Ryerson Base (A,B), and parcel west of RR tracks (E)	NA	No Preplanning	\$0
		Idle equipment if contaminated soil encountered ^b	\$3000-\$5000/day
Estimated Cost if Construction Delayed 1 week			\$21,000 to \$35,000
^a If determined to be necessary			
^b Would apply only if contaminated soil was encountered			

4 What measures are proposed to mitigate identified adverse effects due to the project?

Further investigation is recommended for the project vicinity. The approximate estimated cost for this investigation (Option 1) is summarized in Exhibit 5-1.

Based on the type of construction and the history of the properties that could be acquired, the potential for encountering contaminated media during construction is high.

There is a history of releases from the King County Metro Transit Center, the railroads located adjacent to and on the project site, and the machine shop located at the intersection of First Avenue South and South Atlantic Street. These are all potential areas of concern during construction.

Recommended mitigation measures for identified effects of the project during construction and operation are described below.

Construction Mitigation

Contaminated Environmental Media

The SR 519 project is located near several formerly contaminated sites. If WSDOT conducts further contaminant investigations (Option 1) and remediation is deemed necessary, additional investigations might be needed before construction to clarify potential liability.

If the investigation confirms the presence of contaminated media and contaminated media are encountered within the areas of planned excavation, such as the locations of bridge foundations and stormwater treatment facilities, a Soil Construction Contingency Plan would be needed to identify procedures and chains of responsibility to effectively manage contaminated soil as it is encountered so that delays can be minimized. This plan is slightly different than Option 2, Preplanning, in that this plan would be based on the results of the investigation, whereas Option 2 would be very general in nature. This plan would be comprehensive and address issues such as field screening methods, notification requirements, and soil stockpile management based on the results of the investigation. In addition, petroleum-contaminated soil would

have to be evaluated relative to MTCA cleanup levels, as discussed in the Washington Administrative Code (WAC) 173-340. If soil contaminated by other constituents (e.g., metals or polynuclear aromatic hydrocarbons) is excavated, the soil would need to be compared to Dangerous Waste concentrations (WAC 173-303-090) and MTCA cleanup values. Soils contaminated above landfill disposal criteria would be transported to the nearest appropriate facility for disposal.

The potential to encounter contaminated groundwater was identified above in the evaluation of potential effects of construction activities. If dewatering is needed, the contractor could be required to develop and submit a dewatering plan that addresses the potential for encountering contaminated groundwater, including treatment and disposal of contaminated groundwater or applicable discharge permits.

Underground Storage Tanks and Associated Pipelines
Prior to construction, a geophysical survey could be conducted to locate pipelines or USTs in the vicinity of the study area that would need to be excavated. If found, Ecology's Underground Storage Tank Statute and Regulations (Chapter 90-76 RCW, Chapter 173-360 WAC) would be followed when removing a UST.

Hazardous Material Spills

Stormwater pollution prevention plans (SWPPPs) would be used to mitigate effects on soil, surface water, and groundwater by requiring the implementation of best management practices (BMPs) for runoff from the construction site. In addition, an SPCC plan would address procedures, equipment, and materials used in the event of a spill of contaminated soil, petroleum products, contaminated water, or other hazardous substances during construction adjacent to or over water. The contingency plan would also specify:

- Procedures for notifications in the event of emergencies
- Inspection schedules for storage of hazardous materials
- The identification of migration pathways

- The provision of secondary containment and security for hazardous material storage areas

Worker Safety and Public Health

If hazardous substances used or encountered onsite are not managed properly, workers could be exposed to them. Proper employee training, the use of protective equipment, contingency planning, and secondary containment for hazardous materials would be required for contractors. The appropriate level of personal protective equipment and other requirements could be determined prior to the start of work and in accordance with the WAC 296 and 29 CFR, parts 1910 and 1926. Material safety data sheets for the suspected contaminants contained in the environmental media could be issued to workers. The need for air monitoring during excavation and soil removal activities could also be assessed.

In addition, public access to the project construction zone, contaminated environmental media, and/or hazardous substances could be restricted. Contaminated media moved offsite would be shipped in accordance with U.S. Department of Transportation and Ecology requirements to reduce the potential for releases. These measures would minimize potential public health concerns. WSDOT might also obtain performance bonds, indemnifications, or other agreements with contractors prior to the start of construction activities.

Operational Mitigation

Long-Term Liability

As discussed above under *What are the recommendations and cost estimates for further investigation?*, WSDOT would attempt to minimize long-term liability associated with the necessary acquisitions. Six small land acquisitions, totaling about 5,415 square feet, would be necessary to build the project. Although the hazardous materials records search did not find any specific record of releases at the locations proposed to be acquired, it is recommended that WSDOT enter discussions with the landowners regarding knowledge of any undocumented contamination at each site. The historical record review indicated that the properties investigated have potential for being contaminated from historical releases. By engaging

the landowner early in the process, WSDOT would have the opportunity to verify the history of the site and minimize WSDOT's liability associated with the acquisition of the property.

WSDOT must perform "all appropriate inquiry" as required under Section 101(35)(B)(ii) and (iii) of CERCLA prior to obtaining the property. If the inquiry identifies soil and/or groundwater contamination that has not already been remediated by potentially responsible parties under the voluntary cleanup program, WSDOT might negotiate a price for the property that is reduced by an amount equal to the estimated cost of remediating the contamination, then have the option to pursue an action against the landowner.

5 What are the preliminary mitigation cost estimates?

General cost estimates for construction remediation activities are presented below. Because design information is limited and the extent of contamination is unknown, only unit costs are provided for each activity. Cost estimates are based on information available from other similar project sites in Washington, along with best professional judgment.

Contaminated Soil and Water

Unit rates for soil management have been estimated for offsite treatment or offsite disposal based on the assumption that non-hazardous contaminated soil could be transported to a thermal treatment facility located in western Washington. The typical unit cost at one of these facilities is \$35 per ton. Transportation costs are estimated at \$10 to \$15 per ton plus a \$500 to \$1,000 loading fee. These cost estimates do not include soil characterization costs prior to disposal. Contaminated soil, if encountered, would likely need to be tested for petroleum products and metals (lead). Analytical prices per sample are approximately \$50 to \$80 for petroleum products, \$95 to \$150 for metals, \$200 for volatile organic compounds (VOCs), and \$300 for semi-volatile organic compounds (SVOCs).

Regulated hazardous waste is expected to be encountered during construction of the project. During Phase 1 of the

SR 519 project, approximately 10 percent of all contaminated soil encountered was considered hazardous. If encountered, the disposal cost for regulated hazardous waste is estimated at \$350 per ton. Costs to transport the soil are approximately \$65 per hour and are based on portal-to-portal transportation from the nearest facility. The cost would vary depending upon the specific characteristics of the soil and the level of contamination.

Unit rates for groundwater management have been estimated for offsite disposal based on the assumption that contaminated groundwater could be transported to an environmental disposal facility in western Washington. The estimated groundwater disposal costs (including hazardous waste) anticipated during highway construction ranges from \$0/gallon (should WSDOT be permitted to let contaminated groundwater remain in place) to \$3/gallon. Costs can increase depending upon the characterization of the water and the levels of contamination present.

The above unit costs assume typical conditions and therefore represent a “most likely” estimate for treatment, and/or disposal. These estimates do not include costs for excavation or dewatering because this cost would be incurred regardless of whether the soil or groundwater was contaminated.

Building Demolition

There are no plans to demolish buildings for this project. The only planned demolition is the removal of side concrete barriers where the new off-ramp starts at I-90 and where it ends on the South Atlantic Street Bridge. Because of the nature of the demolition, there should not be any asbestos-containing materials or lead paint encountered.

Underground Storage Tanks

If USTs need to be removed from the project site prior to construction, the estimated cost for decommissioning and removal of a UST (1,000- to 5,000-gallon capacity) would be at least \$6,000. Decommissioning fees typically include excavation of the tank, sampling of soils within the excavation, and completion of any required reporting. The estimates for

UST decommissioning do not include costs of remediation if contamination is encountered within the excavation.

Spill Prevention, Control, and Countermeasure Plan

WSDOT requires SPCC plans for each construction project. Plans typically vary in cost from \$2,000 to \$5,000, depending on the contractor, project size, and location. Plan implementation costs would depend on the contractor's diligence to prevent spills. If care is taken to prevent spills, the plan implementation costs should be less than \$25,000.

6 Are any of the identified effects considered substantial?

The potential for encountering contamination during construction of the Proposed Action is very high, and any such contamination would be mitigated. Construction could be delayed during site remediation, and specially trained construction staff and special management of contaminated soils might be required.

In past years, releases from sites adjacent to the proposed project site have resulted in contaminated soil and groundwater. During construction of the Phase 1 SR 519 project, soil and groundwater contamination was found. There are 24 sites of concern identified within and in the vicinity of the project footprint. The study area is within an industrial area that has had documented releases. Hazardous materials such as underground storage tanks could also be discovered.

While these effects can be managed and mitigation implemented, they cannot be avoided. The greatest contamination concern would be to prevent the contamination from being released or migrating into a different area during construction of the overpass and elevated off-ramp foundations. Migration of contamination can be mitigated during construction of the foundations by a variety of construction techniques, including casing the foundation in saturated zones. This would prevent groundwater from migrating within the bridge foundation excavation during construction and when the project is in operation.

Chapter 6 Cumulative Effects

1 What are cumulative effects, and why are they important?

Cumulative effects are important because they help us to understand the project in terms of a “bigger picture.” They can reveal possible unintended consequences of the Proposed Action or No Build Alternative that might not be apparent when we look at the project by itself. Because of this, cumulative effects help us to evaluate how sustainable the project is likely to be in future years, and how it might interact with other projects that are planned but have not been built yet.

2 How did the project team identify expected cumulative effects relating to hazardous materials or hazardous wastes?

The project team identified expected cumulative effects of the Proposed Action and No Build Alternative by following a process recommended by the President’s Council on Environmental Quality (CEQ, 1997) and as identified in Chapter 412 of the WSDOT *Environmental Procedures Manual* (WSDOT, 2007). The project team combined past and present actions and RFFAs with the expected direct and indirect effects of each of the two alternatives to produce a cumulative picture of how hazardous materials might be affected, with and without the Proposed Action, in the future.

Past and Present Actions

Over many decades, urban development in and around the SR 519 study area has produced a cumulative effect on soils and groundwater through the accumulation of accidentally spilled contaminants (Chapter 4). The SR 519 study area is located within the Greater Duwamish Manufacturing and Industrial Center (City of Seattle, 2006, 2007a). *Toward a Sustainable Seattle*, the City’s comprehensive plan as amended through 2005 (City of Seattle, 2005), and the *Greater Duwamish Manufacturing and Industrial Center Plan* (Greater

What are cumulative effects?

Cumulative effects are impacts on the environment that result “from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. Defined by FHWA and Council on Environmental Quality (CEQ) regulations (40 CFR 1508.7)” (WSDOT, 2006).

Duwamish Planning Committee, 1999) consistently emphasize industrial activities as the dominant land use. Their policies prioritize manufacturing, warehousing, marine uses, transportation, utility, construction, and similar uses. During past decades of industry and commerce in and around the study area, these activities have led to occasional, accidental releases of hazardous materials that have produced a cumulative effect.

Chapter 4, Affected Environment, presents a detailed review of past and present activities that have led to contaminant releases and the current status of contaminated sites in the vicinity of the study area.

Direct and Indirect Effects of the Proposed Action

Chapter 5 discusses how the Proposed Action could directly and indirectly affect the study area with respect to hazardous materials, particularly during construction. These effects, if they occurred, could contribute to the existing cumulative effect of hazardous materials that have already entered the environment or might do so in the reasonably foreseeable future. Chapter 5 identifies four main ways in which this could happen:

- Construction activities could encounter sites that have already been contaminated by other activities in the past. Twenty-four sites of concern are located near or within the study area that could affect or be affected by construction activities.
- Construction equipment or new pilings could encounter previously unidentified underground storage tanks (USTs) and their associated piping. Unknown USTs create the greatest risk to the project because of the explosion hazard and the potential to create a spill if the tank is ruptured.
- A hazardous substance, such as a fuel or lubricant needed for heavy equipment operation or maintenance, could be spilled accidentally during construction.
- Construction workers and the public could be exposed to hazardous materials uncovered, released, or spilled during construction. Workers would be more at risk than the

public because of their proximity to spills during construction operations. A spill of materials brought onsite or encountered during construction, including dust, could expose the public to hazardous substances that pose a health risk.

Over the long term, during operation of the Proposed Action, the potential for a direct or indirect effect involving the accidental release of a hazardous material would be reduced because the Proposed Action would improve traffic flow and increase safety in the study area. As a consequence, the Proposed Action would be less likely to contribute to a cumulative effect than would the No Build Alternative.

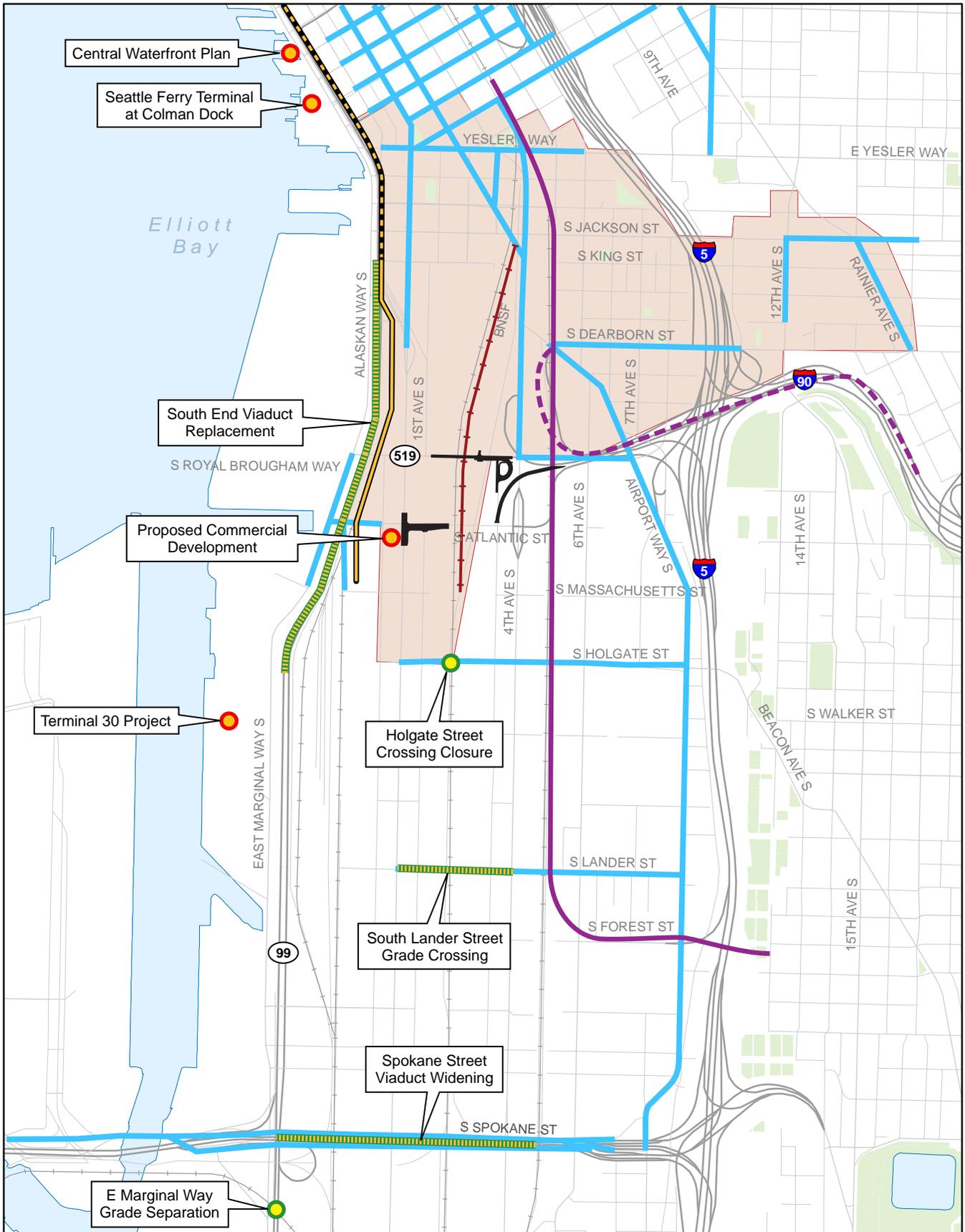
Direct and Indirect Effects of the No Build Alternative

As discussed in Chapter 5, the continuation and intensification of traffic congestion and safety issues under the No Build Alternative would more likely contribute to a cumulative effect relating to hazardous materials than would the Proposed Action.

Reasonably Foreseeable Future Actions

Exhibit 6-1 shows approximate locations of some of the larger reasonably foreseeable future actions that could add to or interact with the Proposed Action to contribute to cumulative effects relating to hazardous materials. Exhibit 6-2 briefly summarizes information about these projects. They include, but are not limited to:

- The South Holgate Street to South King Street Viaduct Replacement Project, and the two-phase Electrical Line Relocation Project, which are Moving Forward projects within the Alaskan Way Viaduct and Seawall Replacement Program
- The South Spokane Street Viaduct project
- Completion of BNSF Railway track improvements
- Sound Transit light rail projects
- Closure of the South Holgate Street rail crossing



Source: City of Seattle (2007) and King County (2006)

- Project
- Livable South Downtown Study Area (Approx.)
- BNSF Railway Completion
- Electrical Line Relocation Phase 1 and Phase 2
- Sound Transit Central Link
- Proposed Sound Transit East Link
- Bridging the Gap Paving Project
- Road Project
- Development Project

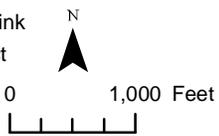


Exhibit 6-1
Reasonably Foreseeable
Future Actions

EXHIBIT 6-2. REASONABLY FORESEEABLE FUTURE ACTIONS IN OR NEAR THE STUDY AREA				
Project ^a	Location	Purpose	Proponent	Expected Construction Time Frame ^b
South Holgate Street to South King Street Viaduct Replacement Project	SR 99 from South Holgate Street to South King Street	Build new SR 99 between South Holgate Street and South King Street. Includes South Atlantic Street and South Royal Brougham Way grade separation, detour routes, and temporary connections	Washington State Department of Transportation	2009-2012
Electrical Line Relocation	Phase 1: South Massachusetts Street to South King Street Phase 2: South King Street to Union Street	Remove network distribution lines and transmission lines that are located under the existing Viaduct before it is demolished	Washington State Department of Transportation	Phase 1: Construction scheduled for 2008-2009. Phase 2: To be determined.
Completion of BNSF Railway Improvements	King Street Station to South Royal Brougham Way	Reduce rail transportation conflicts along the BNSF right-of-way; increase safety at the BNSF crossing of South Royal Brougham Way	BNSF Railway	Improvements at South Royal Brougham Way have been completed; with additional improvements along the BNSF right-of-way currently in progress.
Central Link Light Rail	Downtown Seattle to Sea-Tac Airport	Provide light rail service between downtown Seattle and Sea-Tac Airport	Sound Transit	2008-2009
East Link Light Rail	Downtown Seattle to Redmond	Provide light rail service between downtown Seattle, Mercer Island, Bellevue, and Redmond	Sound Transit	Construction not scheduled. Environmental impact statement scheduled for release in fall 2009.
Proposed Commercial Development	South side of South Atlantic Street between First Avenue South and Utah Avenue South	Provide office and retail uses	Gull Industries	2010-2012
Livable South Downtown Planning Study	The study examines growth and planning issues specific to Pioneer Square, the Chinatown/International District (including the Little Saigon area east of I-5), and the northernmost edges of the Greater Duwamish Manufacturing and Industrial Center.	Stimulate housing and related development consistent with the Mayor's Center City Seattle strategy	City of Seattle, Department of Planning and Development	Environmental impact statement and legislative proposals in 2008

EXHIBIT 6-2. REASONABLY FORESEEABLE FUTURE ACTIONS IN OR NEAR THE STUDY AREA				
Project ^a	Location	Purpose	Proponent	Expected Construction Time Frame ^b
Closure of South Holgate Street at BNSF Railway Crossing	South Holgate Street at the BNSF Railway crossing	Eliminate conflicts between rail and vehicle traffic.	City of Seattle, Department of Transportation	Construction not scheduled
South Lander Street Grade Separation	South Lander Street between First Avenue South and Fourth Avenue South	Improve safety and traffic flow by constructing a roadway bridge for vehicles, bicycles, and pedestrians over the BNSF Railway tracks.	City of Seattle, Department of Transportation	2009-2011
South Spokane Street Viaduct Widening	South Spokane Street from Sixth Avenue South to West Seattle Bridge	Improve traffic safety and upgrade the structural and seismic performance of the viaduct that connects I-5 to the West Seattle High Level Bridge. Construct a new eastbound loop ramp to Fourth Avenue South, to the south of South Spokane Street.	City of Seattle, Department of Transportation	Seismic retrofit, median barrier installation, and street-level utility relocations have been completed. Viaduct widening and ramp construction is scheduled to start in 2008 and would be constructed in phases as funds become available, so exact construction range not known.
Bridging the Gap Paving Projects	Seattle arterial streets	As part of a larger program, the paving projects will resurface, restore, or replace approximately 300 lane-miles of arterial streets; rehabilitate or replace 3-5 bridges and seismically retrofit 5 additional bridges; repair or restore approximately 144 blocks of existing sidewalks; build approximately 117 blocks of new sidewalks; rehabilitate approximately 50 stairways; and restripe about 5,000 crosswalks.	City of Seattle, Department of Transportation	2006-2013

EXHIBIT 6-2. REASONABLY FORESEEABLE FUTURE ACTIONS IN OR NEAR THE STUDY AREA				
Project ^a	Location	Purpose	Proponent	Expected Construction Time Frame ^b
Central Waterfront Plan	South Atlantic Street to West Thomas Street along the shoreline edge of the Center City	Following replacement of the existing Alaskan Way Viaduct, construct new parks and open spaces, shoreline and habitat improvements, improved linkages to the downtown core, <i>and</i> transit connections, <i>and implement</i> land use and regulatory changes.	City of Seattle	Presently in planning process. Construction will begin with the removal of the viaduct and will be ongoing for several years.
Terminal 30 Conversion	East Marginal Way South between approximately South Holgate Street and South Lander Street	Terminal 30 had been used for cruise operations but will be converted back to its original use as a container terminal. This and the adjacent Terminal 25 will provide 70 acres for container use.	Port of Seattle	2007-2009
East Marginal Way Grade Separation Project	East Marginal Way South just south of South Spokane Street	Provide a north- and southbound grade separation on Duwamish Avenue South, relocating East Marginal Way through this corridor to improve access among Port of Seattle terminals, rail yards, and industrial warehouses.	Port of Seattle	2006-2008
Washington State Ferries Terminal Improvements at Colman Dock	Pier 54 at Seattle Waterfront on Alaskan Way South	Upgrade structures and facilities and increase capacity.	Washington State Department of Transportation	Construction not scheduled. For 2008-2009, focus will be on system-wide planning and coordination with nearby projects, including the proposed SR 519 Phase 2.
^a Only major planned projects are listed. Many other projects that could be implemented in the reasonably foreseeable future are not shown. ^b Dates are approximate. Sources: General information from the WSDOT, City of Seattle, Port of Seattle, and Sound Transit websites.				

- Conversion of the Port of Seattle's Terminal 30 to a container terminal
- The East Marginal Way Grade Separation Project
- The City of Seattle's Central Waterfront Plan
- The City of Seattle's Bridging the Gap paving projects
- Washington State Ferries Terminal Improvements at Colman Dock

Urban development is increasing in portions of the South Downtown area immediately north of the study area. This area, which includes Seattle's International District/Chinatown/Little Saigon neighborhood, is currently the subject of Livable South Downtown, a major planning effort by the City of Seattle's Department of Planning and Development. In November 2007, the City of Seattle released the *Draft EIS for Livable South Downtown Planning* (City of Seattle, 2007a), a SEPA programmatic EIS which evaluates options for a comprehensive neighborhood plan for the South Downtown area.

The study examines growth and planning issues specific to Pioneer Square, the Chinatown/International District (including the Little Saigon area east of I-5), and the northernmost edges of the Greater Duwamish Manufacturing and Industrial Center. Preliminary recommendations were released by the City's Department of Planning and Development in March 2006. Land use and zoning changes considered as part of this process will require conducting an environmental review prior to legislative decision-making.

The project most likely to interact with the Proposed Action in the near future is the South Holgate Street to South King Street Viaduct Replacement Project, which will replace the south end of the Viaduct (Exhibit 6-1). That project, a Moving Forward project within the Alaskan Way Viaduct and Seawall Replacement Program, is scheduled for construction from 2009 to 2012, the same time frame as the Proposed Action, and it

will be located immediately west of the proposed SR 519 improvements.

The same types of effects that the Proposed Action could produce during construction, discussed above and in Chapter 4, would also apply to the South End Alaskan Way Viaduct Replacement Project. During the concurrent construction of both projects, each could contribute to a cumulative effect relating to hazardous materials.

3 Would the Proposed Action contribute to cumulative effects relating to hazardous materials?

Proposed Action

In the short term, from 2009 to 2012, construction-related effects of the South End Alaskan Way Viaduct Replacement Project could add to construction-related effects of the Proposed Action because both projects would be under construction at the same time. A cumulative effect relating to hazardous materials could result from either or both projects encountering a previously contaminated site or UST, from accidental spills of fuels, lubricants, or other hazardous materials, or from exposure of workers or members of the public to hazardous materials associated with the concurrent construction activities.

Over the long term, the beneficial effect of the Proposed Action in reducing traffic congestion and increasing safety would help to reduce any long-term cumulative effect relating to hazardous materials, as new spills would be less likely to occur than they are under present conditions.

No Build Alternative

Under the No Build Alternative, new spills of hazardous materials would be at least as likely as under present conditions, because no improvement would be made to the existing SR 519 configuration. Future spills could contribute to the cumulative contamination of soils, surface water, and groundwater in the reasonably foreseeable future.

4 How will cumulative effects on hazardous materials be monitored, mitigated, and managed?

As explained in Chapter 5, contaminated soils and groundwater are likely to be encountered during construction of the Proposed Action. The remedial cleanup of such sites would contribute a small reduction in the cumulative extent of soil and groundwater contamination within the study area. It is also possible that the Proposed Action might alter groundwater pathways and thereby spread existing contaminants. Casing foundations in water-bearing zones would help to prevent groundwater from entering foundation holes and migrating vertically or horizontally. Other mitigation measures, discussed in Chapter 5, would minimize the contribution of the Proposed Action to the cumulative effect of hazardous materials in the study area during construction.

During operation, the Proposed Action would reduce the probability of hazardous material spills from transport trucks by improving traffic flow through the study area. In this way, the project would contribute a long-term reduction in the cumulative contamination of local soils, surface water, and groundwater.

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