APPENDIX C. DATA VALIDATION REPORT

EcoChem, Inc.

Environmental Science and Chemistry

DATA VALIDATION REPORT

Port of Seattle Terminal 117 Upland Investigation

Prepared for:

Windward Environmental, LLC
200 West Mercer Street, Suite 401
Seattle, Washington 98119

Prepared by:

EcoChem, Inc.
710 Second Avenue, Suite 660
Seattle, Washington 98104

EcoChem Project: C22005-1

March 7, 2006

Approved for Release:

Christine Ransom
Project Manager
EcoChem, Inc.

PROJECT NARRATIVE

Basis for the Data Validation

This report summarizes the results of the validation performed on soil samples and associated field and laboratory quality control samples. A **SAMPLE INDEX** is provided, followed by the validation report.

Samples were analyzed by Analytical Resources, Inc. (ARI), Tukwila, Washington. The analytical methods and EcoChem project chemists are listed in the table below.

ANALYSIS METHODS AND ECOCHEM CHEMISTS

Analysis	Method	Primary Review	Secondary Review
PCB – Aroclors	SW 8082	Craig Hutchings	John Mitchell
Pesticides	SW 8081		
Polyaromatic Hydrocarbons	SW 8270D	Mark Brindle/ Mellissa Swanson	
Phthalates	SW 8270D	Mark Brindle	
Metals	SW 6010B	Patricia Lambrecht/ Wayne Francis	Christine Ransom
Total Organic Carbon	Plumb 1981		
Grain Size	PSEP		
Total Solids	E160.3		
Diesel Range Organics	NWTPH-Dx	Mark Lybeer	John Mitchell
Gasoline Range Organics	NWTPH-Gx		
Hydrocarbon Identification	NWTPH-HCID		

The data were reviewed using guidance and quality control criteria documented in the analytical methods; the project quality assurance project plan (QAPP) *Port of Seattle, T-117 Upland Investigation (January 13, 2006),* and *National Functional Guidelines for Inorganic (USEPA 1994 & 2002) and Organic Data Review* (USEPA 1999).

Data qualifier definitions, reason codes, and validation criteria are included as **APPENDIX A**. **APPENDIX B** contains the Qualified Data Summary Table**.** Data validation worksheets will be kept on file at EcoChem.

Sample Index
Port of Seattle
Terminal 117 Upland Investigation
SDG IY32

Sample ID	Laboratory ID	TOC	Total Solids	PAH	PCB	DRO	Grain Size	Metals
T117-A9-SB-01	06-491-IY32A	✓	✓	✓	✓	✓		
T117-A9-SB-02	06-492-IY32B		✓	✓	✓	✓		
T117-A9-SB-03	06-493-IY32C		✓	✓	✓	✓	✓	
T117-A7-SB-01	06-494-IY32D	✓	✓	✓	✓	✓		
T117-A7-SB-02	06-495-IY32E		✓	✓	✓	✓		
T117-A7-SB-03	06-496-IY32F		✓	✓	✓	✓		
T117-A7-SB-201	06-497-IY32G		✓	✓	✓	✓		
T117-A6-SB-01	06-498-IY32H		✓	✓	✓	✓		✓
T117-A6-SB-02	06-499-IY32I	✓	✓	✓	✓	✓		✓
T117-A6-SB-03	06-500-IY32J		✓	✓	✓	✓		✓
T117-A2-SB-01	06-501-IY32K		✓	✓	✓	✓		
T117-A2-SB-02	06-502-IY32L	✓	✓	✓	✓	✓		
T117-A2-SB-03	06-503-IY32M		✓	✓	✓	✓		
T117-A8-SB-01	06-504-IY32N	✓	✓	✓	✓	✓		
T117-A8-SB-02	06-505-IY32O		✓	✓	✓	✓		
T117-A8-SB-03	06-506-IY32P		✓	✓	✓	✓		
T117-A5-SB-01	06-507-IY32Q		✓	✓	✓	✓		
T117-A5-SB-02	06-508-IY32R	✓	✓	✓	✓	✓		
T117-A5-SB-02	06-508-IY32RDL				✓			
T117-A5-SB-03	06-509-IY32S		✓	✓	✓	✓		
T117-A1-SB-01	06-510-IY32T		✓	✓	✓	✓		

Sample Index
Port of Seattle
Terminal 117 Upland Investigation
SDG IY33

Sample ID	Laboratory ID	TOC	Total Solids	PAH	PCB	DRO	Grain Size	Metals
T117-A1-SB-02	06-511-IY33A	✓	✓	✓	✓	✓		
T117-A1-SB-03	06-512-IY33B		✓	✓	✓	✓		
T117-A3-SB-01	06-513-IY33C		✓	✓	✓	✓		
T117-A3-SB-01	06-513-IY33CDL				✓			
T117-A3-SB-02	06-514-IY33D	✓	✓	✓	✓	✓		
T117-A3-SB-03	06-515-IY33E		✓	✓	✓	✓		
T117-A4-SB-01	06-516-IY33F		✓	✓	✓	✓		✓
T117-A4-SB-02	06-517-IY33G	✓	✓	✓	✓	✓	✓	✓
T117-A4-SB-03	06-518-IY33H		✓	✓	✓	✓		✓
T117-A4-SB-202	06-519-IY33I		✓	✓	✓	✓		✓
T117-A4-SB-RB	06-520-IY33J			✓	✓	✓		✓

Sample Index
Port of Seattle
Terminal 117 Upland Investigation
SDG IY35

Sample ID	Laboratory ID	TOC	Total Solids	PAH	PCB	DRO	Metals
T117-B1-SB-01	06-550-IY35A		✓	✓	✓	✓	✓
T117-B1-SB-02	06-551-IY35B	✓	✓	✓	✓	✓	✓
T117-B1-SB-03	06-552-IY35C		✓	✓	✓	✓	✓
T117-B1-SB-04	06-553-IY35D		✓	✓	✓	✓	✓
T117-B2-SB-01	06-554-IY35E	✓	✓	✓	✓	✓	
T117-B2-SB-02	06-555-IY35F		✓	✓	✓	✓	
T117-B2-SB-03	06-556-IY35G		✓	✓	✓	✓	
T117-B2-SB-04	06-557-IY35H		✓	✓	✓	✓	
T117-B2-SB-04	06-557-IY35HDL				✓		
T117-B2-SB-05	06-558-IY35I		✓	✓	✓	✓	
T117-B2-SB-06	06-559-IY35J		✓	✓	✓	✓	
T117-B2-SB-07	06-560-IY35K		✓	✓	✓	✓	
T117-B2-SB-203	06-561-IY35L	✓	✓				
T117-B2-SB-204	06-562-IY35M		✓	✓	✓	✓	
T117-B3-SB-01	06-563-IY35N	✓	✓	✓	✓	✓	
T117-B3-SB-01	06-563-IY35NDL				✓		
T117-B3-SB-02	06-564-IY35O		✓	✓	✓	✓	
T117-B3-SB-02	06-564-IY35ODL			✓			
T117-B3-SB-03	06-565-IY35P		✓	✓	✓	✓	
T117-B6-SB-01	06-566-IY35Q		✓	✓	✓	✓	
T117-B6-SB-02	06-567-IY35R	✓	✓	✓	✓	✓	
T117-B6-SB-03	06-568-IY35S		✓	✓	✓	✓	
T117-B6-SB-205	06-569-IY35T		✓	✓	✓	✓	

Sample Index
Port of Seattle
Terminal 117 Upland Investigation
SDG IY36

Sample ID	Laboratory ID	TOC	Total Solids	PAH	PCB	DRO	Grain Size
T117-B4-SB-01	06-570-IY36A	✓	✓	✓	✓	✓	
T117-B4-SB-01	06-570-IY36ADL				✓		
T117-B4-SB-02	06-571-IY36B		✓	✓	✓	✓	
T117-B4-SB-02	06-571-IY36BDL			✓			
T117-B4-SB-03	06-572-IY36C		✓	✓	✓	✓	
T117-B4-SB-03	06-572-IY36CDL			✓			
T117-B4-SB-04	06-573-IY36D		✓	✓	✓	✓	✓
T117-B5-SB-01	06-577-IY36E	✓	✓	✓	✓	✓	
T117-B5-SB-02	06-578-IY36F		✓	✓	✓	✓	
T117-B5-SB-03	06-579-IY36G		✓	✓	✓	✓	
T117-B5-RB	06-580-IY36H			✓	✓	✓	
T117-A10-SB-01	06-581-IY36I	✓	✓	✓	✓	✓	
T117-A10-SB-206	06-582-IY36J	✓	✓	✓	✓	✓	

Sample Index
Port of Seattle
Terminal 117 Upland Investigation
SDG IY64

Sample ID	Laboratory ID	TOC	Total Solids	PAH	PCB	DRO	HCID	Grain Size	Metals
T117-B7-SB-0.5-2.0	06-614-IY64A		✓	✓	✓	✓	✓		✓
T117-B7-SB-2.0-3.5	06-615-IY64B	✓	✓	✓	✓	✓	✓		✓
T117-B7-SB-3.5-5.0	06-616-IY64C		✓	✓	✓	✓	✓		✓
T117-B7-SB-5.0-6.5	06-617-IY64D		✓	✓	✓		✓		✓
T117-B7-SB-6.5-8.0	06-618-IY64E		✓	✓	✓		✓		✓
T117-B7-SB-8.0-9.5	06-619-IY64F		✓	✓	✓		✓		✓
T117-B7-SB-9.5-11.0	06-620-IY64G		✓	✓	✓		✓		✓
T117-B7-SB-11.0-12.5	06-621-IY64H		✓	✓	✓		✓		✓
T117-B7-SB-11.0-12.5	06-621-IY64HDL				✓				
T117-B7-SB-12.5-14	06-622-IY64I		✓	✓	✓		✓		✓
T117-B7-SB-14-15.5	06-623-IY64J		✓	✓	✓		✓		✓
T117-D4-SB-01	06-624-IY64K	✓	✓	✓	✓		✓		✓
T117-D4-SB-02	06-625-IY64L		✓	✓	✓		✓	✓	✓

Sample Index
Port of Seattle
Terminal 117 Upland Investigation
SDG IY65

Sample ID	Laboratory ID	TOC	Total Solids	PAH	PCB	DRO	HCID	Metals
T117-D4-SB-03	06-626-IY65A		✓	✓	✓		✓	✓
T117-D8-SB-01	06-627-IY65B	✓	✓	✓	✓		✓	✓
T117-D8-SB-02	06-628-IY65C		✓	✓	✓		✓	✓
T117-D8-SB-03	06-629-IY65D		✓	✓	✓		✓	✓
T117-D8-SB-RB	06-630-IY65E		✓	✓	✓		✓	✓
T117-D1-SB-01	06-631-IY65F	✓	✓	✓	✓	✓		
T117-D1-SB-02	06-632-IY65G		✓	✓	✓	✓		
T117-D1-SB-03	06-633-IY65H		✓	✓	✓	✓		
T117-D1-SB-207	06-634-IY65I	✓	✓					

Sample Index
Port of Seattle
Terminal 117 Upland Investigation
SDG IY71

Sample ID	Laboratory ID	TOC	Total Solids	PAH	PCB	DRO	Grain Size	Metals
T117-D2-SB-01	06-686-IY71A	✓	✓	✓	✓	✓		
T117-D2-SB-02	06-687-IY71B		✓	✓	✓	✓		
T117-D2-SB-05	06-688-IY71C		✓	✓	✓	✓		
T117-D2-SB-06	06-689-IY71D		✓	✓	✓	✓	✓	
T117-D2-SB-07	06-690-IY71E		✓	✓	✓	✓		
T117-D5-SB-01	06-691-IY71F	✓	✓	✓	✓	✓		
T117-D5-SB-02	06-692-IY71G		✓	✓	✓	✓		
T117-D5-SB-03	06-693-IY71H		✓	✓	✓	✓		
T117-B7-SB-208	06-694-IY71I		✓	✓	✓	✓		✓
T117-D3-SB-1.5-3.0	06-695-IY71J		✓	✓	✓	✓		✓
T117-D3-SB-3.0-4.5	06-696-IY71K	✓	✓	✓	✓	✓		✓
T117-D3-SB-4.5-6.0	06-697-IY71L		✓	✓	✓	✓		✓
T117-D5-SB-04	06-698-IY71M		✓	✓	✓	✓		

Sample Index
Port of Seattle
Terminal 117 Upland Investigation
SDG IY72

Sample ID	Laboratory ID	TOC	Total Solids	PAH	PCB	DRO	Metals
T117-D3-SB-6.0-7.5	06-699-IY72A		✓	✓	✓	✓	✓
T117-D3-SB-7.5-9.0	06-700-IY72B		✓	✓	✓	✓	✓
T117-D3-SB-9.0-10.5	06-701-IY72C		✓	✓	✓	✓	✓
T117-D3-SB-10.5-12.0	06-702-IY72D		✓	✓	✓	✓	✓
T117-D3-SB-12.0-13.5	06-703-IY72E		✓	✓	✓	✓	✓
T117-D6-SB-0.5-2.0	06-704-IY72F		✓	✓	✓	✓	✓
T117-D6-SB-2.0-3.5	06-705-IY72G		✓	✓	✓	✓	✓
T117-D6-SB-2.0-3.5	06-705-IY72GDL			✓	✓		
T117-D6-SB-3.5-5.0	06-706-IY72H	✓	✓	✓	✓	✓	✓
T117-D6-SB-5.0-6.5	06-707-IY72I		✓	✓	✓	✓	✓
T117-D6-SB-6.5-8.0	06-708-IY72J		✓	✓	✓	✓	✓
T117-D6-SB-8.0-9.5	06-709-IY72K		✓	✓	✓	✓	✓
T117-D6-SB-9.5-11.0	06-710-IY72L		✓	✓	✓	✓	✓
T117-D6-SB-11.0-12.5	06-711-IY72M		✓	✓	✓	✓	✓
T117-D6-SB-12.5-14.0	06-712-IY72N		✓	✓	✓		✓
T117-D6-SB-209	06-713-IY72O		✓			✓	✓
T117-D6-SB-210	06-714-IY72P		✓	✓	✓	✓	
T117-D6-SB-RB	06-715-IY72Q			✓	✓	✓	✓

Sample Index
Port of Seattle
Terminal 117 Upland Investigation
SDG IY78

Sample ID	Laboratory ID	TOC	Total Solids	PAH	PCB	DRO	Metals
T117-D11-SB-01	06-723-IY78A		✓	✓	✓	✓	✓
T117-D11-SB-02	06-724-IY78B	✓	✓	✓	✓	✓	✓
T117-D11-SB-03	06-725-IY78C		✓	✓	✓	✓	✓
T117-D11-SB-04	06-726-IY78D		✓	✓	✓	✓	✓
T117-D11-SB-04	06-726-IY78DDL				✓		
T117-D11-SB-05	06-727-IY78E		✓	✓	✓	✓	✓
T117-D11-SB-06	06-728-IY78F		✓	✓	✓	✓	✓
T117-D11-SB-07	06-729-IY78G		✓	✓	✓	✓	✓
T117-D11-SB-211	06-730-IY78H		✓	✓	✓	✓	✓
T117-E1-SB-0.6-2.0	06-731-IY78I	✓	✓	✓	✓	✓	✓
T117-E1-SB-2.0-3.5	06-732-IY78J		✓	✓	✓	✓	✓
T117-E1-SB-3.5-5.0	06-733-IY78K		✓	✓	✓	✓	✓
T117-E1-SB-5.0-6.5-A	06-734-IY78L		✓	✓	✓	✓	✓
T117-E1-SB-6.5-8.0	06-735-IY78M		✓	✓	✓	✓	✓
T117-E1-SB-5.0-6.5-B	06-736-IY78N		✓	✓	✓	✓	✓
T117-E1-SB-212	06-737-IY78O		✓	✓	✓	✓	
T117-E1-SB-8.0-9.5	06-738-IY78P		✓	✓	✓	✓	✓
T117-E1-SB-9.5-11.0	06-739-IY78Q		✓	✓	✓	✓	✓
T117-E1-SB-11.0-12.5	06-740-IY78R		✓	✓	✓	✓	✓
T117-E1-SB-12.5-14.0	06-741-IY78S		✓	✓	✓	✓	✓
T117-E1-SB-12.5-14.0	06-741-IY78SDL				✓		

Sample Index
Port of Seattle
Terminal 117 Upland Investigation
SDG IY79

Sample ID	Laboratory ID	TOC	Total Solids	PAH	PCB	DRO	Grain Size	Metals
T117-C7-SB-01	06-742-IY79A		✓	✓	✓	✓		✓
T117-C7-SB-02	06-743-IY79B	✓	✓	✓	✓	✓	✓	✓
T117-C7-SB-03	06-744-IY79C		✓	✓	✓	✓		✓
T117-C7-SB-04	06-745-IY79D		✓	✓	✓	✓		✓
T117-C7-SB-05	06-746-IY79E		✓	✓	✓	✓		✓

Sample Index
Port of Seattle
Terminal 117 Upland Investigation
SDG IY82

Sample ID	Laboratory ID	TOC	Total Solids	PAH	PCB	DRO	PEST	Metals
T117-E2-SB-01	06-754-IY82A	✓	✓	✓	✓	✓		✓
T117-E2-SB-02	06-755-IY82B		✓	✓	✓	✓		✓
T117-E2-SB-03	06-756-IY82C		✓	✓	✓	✓		✓
T117-E2-SB-04-A	06-757-IY82D		✓	✓	✓	✓		✓
T117-E2-SB-04-B	06-758-IY82E		✓	✓	✓	✓		✓
T117-C8-SB-01	06-759-IY82F	✓	✓	✓	✓	✓		✓
T117-C8-SB-02	06-760-IY82G		✓	✓	✓	✓		✓
T117-C8-SB-03	06-761-IY82H		✓	✓	✓	✓		✓
T117-F3-SB-01	06-762-IY82I		✓	✓	✓	✓		✓
T117-F3-SB-02	06-763-IY82J	✓	✓	✓	✓	✓		✓
T117-F3-SB-03	06-764-IY82K		✓	✓	✓	✓		✓
T117-F3-SB-04	06-765-IY82L		✓	✓	✓	✓		✓
T117-E2-SB-RB	06-766-IY82M			✓	✓	✓		✓
T117-C3-SB-01	06-767-IY82N		✓	✓	✓	✓	✓	✓
T117-C3-SB-02	06-768-IY82O	✓	✓	✓	✓	✓	✓	✓
T117-C3-SB-02	06-768-IY82ODL				✓	✓		✓
T117-C3-SB-03	06-769-IY82P		✓	✓	✓	✓	✓	✓
T117-C3-SB-213	06-770-IY82Q		✓	✓	✓		✓	
T117-C3-SB-RB	06-771-IY82R			✓	✓	✓	✓	

Sample Index
Port of Seattle
Terminal 117 Upland Investigation
SDG IY86

Sample ID	Laboratory ID	TOC	Total Solids	PAH	PCB	DRO	Grain Size	Metals
T117-C1-SB-01	06-798-IY86A		✓	✓	✓	✓		
T117-C1-SB-02	06-799-IY86B		✓	✓	✓	✓		
T117-C1-SB-03	06-800-IY86C	✓	✓	✓	✓	✓	✓	
T117-C1-SB-03	06-800-IY86CDL				✓			
T117-C1-SB-04	06-801-IY86D		✓	✓	✓	✓	✓	
T117-C1-SB-05	06-802-IY86E		✓	✓	✓	✓		
T117-C1-SB-05	06-802-IY86EDL				✓			
T117-C1-SB-06	06-803-IY86F		✓	✓	✓	✓	✓	
T117-C2-SB-01	06-804-IY86G	✓	✓	✓	✓	✓		
T117-C2-SB-02	06-805-IY86H		✓	✓	✓	✓		
T117-C2-SB-03	06-806-IY86I		✓	✓	✓	✓		
T117-C2-SB-04	06-807-IY86J		✓	✓	✓	✓		
T117-C2-SB-05	06-808-IY86K		✓	✓	✓	✓		
T117-C2-SB-06	06-809-IY86L		✓	✓	✓	✓	✓	
T117-C6-SB-3.5-5.0	06-810-IY86M		✓	✓	✓	✓		✓
T117-C6-SB-5.0-6.5	06-811-IY86N	✓	✓	✓	✓	✓		✓
T117-C6-SB-5.0-6.5	06-811-IY86NDL				✓			
T117-C6-SB-6.5-8.0	06-812-IY86O		✓	✓	✓	✓		✓
T117-C6-SB-8.0-9.5	06-813-IY86P		✓	✓	✓	✓		✓
T117-C6-SB-9.5-11.0	06-814-IY86Q		✓	✓	✓	✓		✓
T117-C6-SB-11.0-12.5	06-815-IY86R		✓	✓	✓	✓		✓
T117-C6-SB-12.5-14.0	06-816-IY86S		✓	✓	✓	✓		✓

Sample Index
Port of Seattle
Terminal 117 Upland Investigation
SDG IY93

Sample ID	Laboratory ID	TOC	Total Solids	PAH	PCB	DRO	PEST	Metals
T117-C4-SB-3.5-5.0	06-865-IY93A	✓	✓	✓	✓	✓	✓	✓
T117-C4-SB-3.5-5.0	06-865-IY93ADL			✓				
T117-C4-SB-5.0-6.5	06-866-IY93B		✓	✓	✓	✓	✓	✓
T117-C4-SB-5.0-6.5	06-866-IY93BDL			✓	✓			
T117-C4-SB-6.5-8.0	06-867-IY93C		✓	✓	✓	✓	✓	✓
T117-C4-SB-6.5-8.0	06-867-IY93CDL			✓				
T117-C4-SB-8.0-9.5	06-868-IY93D		✓	✓	✓	✓	✓	✓
T117-C4-SB-9.5-11.0	06-869-IY93E		✓	✓	✓	✓	✓	✓
T117-C4-SB-11.0-12.5	06-870-IY93F		✓	✓	✓	✓	✓	✓
T117-C4-SB-12.5-14.0	06-871-IY93G		✓	✓	✓	✓	✓	✓
T117-C5-SB-5.0-6.5	06-872-IY93H	✓	✓	✓	✓	✓		✓
T117-C5-SB-6.5-8.0	06-873-IY93I		✓	✓	✓	✓		✓
T117-C5-SB-8.0-9.5	06-874-IY93J		✓	✓	✓	✓		✓
T117-C5-SB-9.5-11.0	06-875-IY93K		✓	✓	✓	✓		✓
T117-C5-SB-11.0-12.5	06-876-IY93L		✓	✓	✓	✓		✓
T117-C5-SB-12.5-14.0	06-877-IY93M		✓	✓	✓	✓		✓
T117-C1-SB-RB	06-878-IY93N			✓	✓	✓		
T117-C5-SB-RB	06-879-IY93O			✓	✓	✓		

Sample Index
Port of Seattle
Terminal 117 Upland Investigation
SDG IZ04

Sample ID	Laboratory ID	TOC	Total Solids	PAH	PCB	DRO	GRO	HCID	Metals
T117-B8-SB-01	06-914-IZ04A		✓	✓	✓	✓	✓	✓	✓
T117-B8-SB-01	06-914-IZ04ADL				✓				
T117-B8-SB-02	06-915-IZ04B	✓	✓	✓	✓	✓		✓	✓
T117-B8-SB-02	06-915-IZ04BDL				✓				
T117-B8-SB-03	06-916-IZ04C		✓	✓	✓			✓	✓
T117-B8-SB-214	06-917-IZ04D		✓	✓	✓	✓		✓	✓
T117-B8-SB-214	06-917-IZ04DDL				✓				
T117-D9-SB-01	06-918-IZ04E	✓	✓	✓	✓	✓			✓
T117-D9-SB-02	06-919-IZ04F		✓	✓	✓	✓			✓
T117-D9-SB-02	06-919-IZ04FDL				✓				
T117-D9-SB-03	06-920-IZ04G		✓	✓	✓	✓			✓
T117-D10-SB-01	06-921-IZ04H		✓	✓	✓	✓			✓
T117-D10-SB-01	06-921-IZ04HDL				✓				
T117-D10-SB-02	06-922-IZ04I	✓	✓	✓	✓	✓			✓
T117-D10-SB-03	06-923-IZ04J		✓	✓	✓	✓			✓
T117-E3-SB-01	06-924-IZ04K	✓	✓	✓	✓	✓			✓
T117-E3-SB-02	06-925-IZ04L		✓	✓	✓	✓			✓
T117-E3-SB-03	06-926-IZ04M		✓	✓	✓	✓			✓

Sample Index
Port of Seattle
Terminal 117 Upland Investigation
SDG IZ05

Sample ID	Laboratory ID	TOC	Total Solids	PAH	PCB	DRO
T117-F6-SB-01	06-927-IZ05A	✓	✓	✓	✓	✓
T117-F6-SB-02	06-928-IZ05B		✓	✓	✓	✓
T117-F6-SB-03	06-929-IZ05C		✓	✓	✓	✓
T117-F6-SB-03	06-929-IZ05CDL				✓	
T117-F6-SB-04	06-930-IZ05D		✓	✓	✓	✓
T117-F6-SB-RB	06-931-IZ05E			✓	✓	✓
T117-F7-SB-01	06-932-IZ05F		✓	✓	✓	✓
T117-F7-SB-02	06-933-IZ05G	✓	✓	✓	✓	✓
T117-F7-SB-03	06-934-IZ05H		✓	✓	✓	✓
T117-F9-SB-01	06-935-IZ05I		✓	✓	✓	✓
T117-F9-SB-02	06-936-IZ05J	✓	✓	✓	✓	✓
T117-F9-SB-03	06-937-IZ05K		✓	✓	✓	✓
T117-F8-SB-01	06-938-IZ05L	✓	✓	✓	✓	✓
T117-F8-SB-02	06-939-IZ05M		✓	✓	✓	✓
T117-F8-SB-02	06-939-IZ05MDL				✓	
T117-F8-SB-03	06-940-IZ05N		✓	✓	✓	✓
T117-F8-SB-RB	06-941-IZ05O			✓	✓	✓

Sample Index
Port of Seattle
Terminal 117 Upland Investigation
SDG IZ15

Sample ID	Laboratory ID	TOC	Total Solids	PAH	PCB	DRO	Grain Size
T117-F4-SB-01	06-992-IZ15A	✓	✓	✓	✓	✓	
T117-F4-SB-01	06-992-IZ15ADL				✓		
T117-F4-SB-02	06-993-IZ15B		✓	✓	✓	✓	
T117-F4-SB-03	06-994-IZ15C		✓	✓	✓	✓	
T117-F2-SB-01	06-995-IZ15D	✓	✓	✓	✓	✓	✓
T117-F2-SB-02	06-996-IZ15E		✓	✓	✓	✓	✓
T117-F2-SB-03	06-997-IZ15F		✓	✓	✓	✓	✓
T117-F2-SB-04	06-998-IZ15G		✓	✓	✓	✓	
T117-F2-SB-05	06-999-IZ15H		✓	✓	✓	✓	✓
T117-F5-SB-01	06-1000-IZ15I	✓	✓	✓	✓	✓	
T117-F5-SB-01	06-1000-IZ15IDL				✓		
T117-F5-SB-02	06-1001-IZ15J		✓	✓	✓	✓	
T117-F5-SB-03	06-1002-IZ15K		✓	✓	✓	✓	
T117-F5-SB-05	06-1003-IZ15L		✓	✓	✓	✓	
T117-F1-SB-01	06-1004-IZ15M	✓	✓	✓	✓	✓	
T117-F1-SB-02	06-1005-IZ15N		✓	✓	✓	✓	
T117-F1-SB-02	06-1005-IZ15NDL				✓		
T117-F1-SB-03	06-1006-IZ15O		✓	✓	✓	✓	
T117-F1-SB-04	06-1007-IZ15P		✓	✓	✓	✓	

Sample Index
Port of Seattle
Terminal 117 Upland Investigation
SDG IZ16

Sample ID	Laboratory ID	TOC	Total Solids	PAH	PCB	DRO	Metals
T117-D7-SB-0.0-1.5	06-1008-IZ16A	✓	✓	✓	✓	✓	✓
T117-D7-SB-3.0-4.5	06-1009-IZ16B		✓	✓	✓	✓	✓
T117-D7-SB-4.5-6.0	06-1010-IZ16C		✓	✓	✓	✓	✓
T117-D7-SB-6.0-7.5	06-1011-IZ16D		✓	✓	✓	✓	✓
T117-D7-SB-7.5-9.0	06-1012-IZ16E		✓	✓	✓	✓	✓
T117-D7-SB-9.0-10.5	06-1013-IZ16F		✓	✓	✓	✓	✓
T117-D7-SB-10.5-12.0	06-1014-IZ16G		✓	✓	✓	✓	✓
T117-D7-SB-12.0-13.5	06-1015-IZ16H		✓	✓	✓	✓	✓
T117-D7-SB-215	06-1016-IZ16I		✓			✓	
T117-A11-SB-0.0-0.5	06-1017-IZ16J	✓	✓		✓		
T117-A12-SB-0.0-0.5	06-1019-IZ16L	✓	✓		✓		
T117-D7-SB-RB	06-1021-IZ16N			✓	✓	✓	✓

Sample Index
Port of Seattle
Terminal 117 Upland Investigation
SDG JA73

Sample ID	Laboratory ID	TOC	Total Solids	PAH	PCB
T117-A12-SB-0.5-1.5	06-2229-JA73A		✓		✓

DATA VALIDATION REPORT
Port of Seattle Terminal 117
Semivolatile Organic Compounds
SW846 Method 8270D

This report documents the review of the data from the analysis of sediments sample for semivolatile compounds. The samples were analyzed by Analytical Resources, Inc. (ARI), Tukwila, Washington. Refer to the **Sample Index** for sample identification.

Sample Delivery Group SDG	Number of Samples	Level of Validation
IY32	20 SOIL SAMPLES	SUMMARY
IY33	9 SOIL SAMPLES, 1 RINSATE	SUMMARY
IY35	19 SOIL SAMPLES	SUMMARY
IY36	9 SOIL SAMPLES, 1 RINSATE	SUMMARY
IY64	12 SOIL SAMPLES	SUMMARY
IY65	7 SOIL SAMPLES, 1 RINSATE	SUMMARY
IY71	13 SOIL SAMPLES	SUMMARY
IY72	15 SOIL SAMPLES, 1 RINSATE	SUMMARY
IY78	19 SOIL SAMPLES	FULL
IY79	5 SOIL SAMPLES	SUMMARY
IY82	16 SOIL SAMPLES, 2 RINSATES	SUMMARY
IY86	19 SOIL SAMPLES	FULL
IY93	13 SOIL SAMPLES, 2 RINSATES	SUMMARY
IZ04	13 SOIL SAMPLES	SUMMARY
IZ05	13 SOIL SAMPLES, 2 RINSATES	SUMMARY
IZ15	16 SOIL SAMPLES	SUMMARY
IZ16	8 SOIL SAMPLES, 1 RINSATE	SUMMARY

I. DELIVERABLES/DOCUMENTATION

The laboratory provided all necessary data and documentation to meet project quality assurance program plan (QAPP) requirements. Good documentation practices were observed by the laboratory in the following areas: changes and corrections were struck out by a single line with the entry initialed and dated by the analyst; correction fluid or tape was not found on any of the data; and proper units for numerical values were used.

SDGs IY64 & IY65: Phthalate analysis was not requested on the chain of custody for Samples T117-D4-SB-01, T117-D4-SB-02, and T117-D4-SB-03. The data were validated and no further action was taken.

SDG IY71: Sample T117-D5-SB-04 was not listed on the chain of custody. The sample was analyzed as per client request.

II. FIELD QUALITY CONTROL

SDG IY32: Samples T117-A7-SB-02 and T117-A7-SB-201 were submitted as field duplicates. No positive results were reported; field precision was acceptable.

SDG IY33: Samples T117-A4-SB-03 and T117-A4-SB-202 were submitted as field duplicates. No target compounds were detected in the duplicate sample; chrysene was detected at the reporting limit in the parent sample. Field precision was acceptable.

SDG IY35: Samples T117-B2-SB-07 & T117-B2-SB-204 and T117-B6-SB-02 & T117-B6-SB-205 were submitted as field duplicates. No positive results were reported; field precision was acceptable.

SDG IY36: Samples T117-A10-SB-01 and T117-A10-SB-206 were submitted as field duplicates. No positive results were reported; field precision was acceptable.

SDGs IY64 & IY71: Field duplicate T117-B7-SB208 was submitted with IY71, and its parent sample, T117-B7-SB-8.0-9.5 was submitted with IY64. No target compounds were detected in either sample. Field precision was acceptable.

SDG IY72: Samples T117-D6-SB-11.0-12.5 and T117-D6-SB-210 were submitted as field duplicates. No target compounds were detected in either sample. Field precision was acceptable.

SDG IY78: Samples T117-D11-SB-06 & T117-D11-SB-211 were submitted as field duplicates. No positive results were reported in either sample. Samples T117-E1-SB-6.5-8.0 & T117-E1-SB-212 were also submitted as a field duplicate pair. All RPD values were within the control limit of 75%. Field precision was acceptable.

SDG IY82: Samples T117-C3-SB-03 and T117-C3-SB-213 were submitted as field duplicates. No target compounds were detected in either sample. Field precision was acceptable.

SDG IZ04: Samples T117-B8-SB-02 and T117-B8-SB-214 were submitted as field duplicates. All RPD values were less than the control limit of 75% or the absolute difference was less than twice the reporting limit. Field precision was acceptable.

See **Section 4.0** for a discussion of field blanks.

III. TECHNICAL ASSESSMENT

1.0 Holding Times and Sample Receipt: ACCEPTABLE/With the following discussion:

Qualified Data: None

Discussion:

The QAPP-required holding time criterion for soil samples is 14 days from date of sampling to date of extraction. The QAPP-required holding time criterion for all extracts is 40 days from extraction to analysis. All samples were extracted and analyzed within the holding time criteria.

All SDGs: The temperatures of several sample coolers (ranging from 0.0°C to 6.7°C) were outside the control limit of 2.0°C to 6.0°C at sample receipt. Samples were received the same day as collection; therefore, the temperature outliers were judged to have no impact on the reported results.

2.0 GC/MS Instrument Performance Check: ACCEPTABLE/All criteria met

Decafluorotriphenylphosphine (DFTPP) was analyzed at the beginning of each 12-hour analytical sequence, as required. All necessary decafluorotriphenylphosphine data were provided, and results were within the allowable limits.

3.0 Initial and Continuing Calibration: ACCEPTABLE/With the following discussion:

Qualified Data: See the **Qualified Data Summary Table**

Discussion:

A six-point initial calibration (ICAL) was performed. The percent relative standard deviations (%RSD) were within the control limit of ±30%, all correlation coefficients (r) were greater than 0.99, and relative response factor (RRF) values were calculated correctly and were greater than the minimum of 0.05.

Continuing calibrations (CCAL) were analyzed at the proper frequency. The percent differences (%D) were within the control limit of ±25% and RRF values were greater than the minimum of 0.05, with the exceptions below. The %D values were calculated correctly.

SDG IY32: The %D value for benzo(g,h,i)perylene (27.4%) exceeded the control limit of ±25% from the CCAL analyzed on 1/19/06. The outlier was indicative of a low bias; results and reporting limits were estimated (J/UJ-5B) in all associated samples.

SDG IY33: The %D value for benzo(g,h,i)perylene was 25.4% from the CCAL analyzed on 1/18/06. The %D value rounds to 25%; therefore no action was taken.

SDG IZ15: The %D value for benzo(g,h,i)perylene (29.2%) exceeded the control limit of ±25% from the CCAL analyzed on 2/3/06. The outlier was indicative of a low bias; results and reporting limits were estimated (J/UJ-5B) in all associated samples.

4.0 Blank Analyses: ACCEPTABLE/All criteria met

A method blank was extracted and analyzed at the proper frequency. No target analytes were detected in the method blanks at concentrations greater than or equal to the reporting limit.

SDG IY33: One rinsate blank was submitted with this SDG. No positive results were reported in T117-A4-SB-RB.

SDG IY36: One rinsate blank was submitted with this SDG. No positive results were reported in T117-B5-SB-RB.

SDG IY65: One rinsate blank was submitted with this SDG. No positive results were reported in T117-D8-SB-RB.

SDG IY72: One rinsate blank was submitted with this SDG. No positive results were reported in Sample T117-D6-SB-RB.

SDG IY82: Two rinsate blanks were submitted with this SDG. No positive results were reported in T117-E2-SB-RB or T117-C3-SB-RB.

SDG IY93: Two rinsate blanks were submitted with this SDG. No positive results were reported in T117-C1-SB-RB or T117-C5-SB-RB.

SDG IZ05: Two rinsate blanks were submitted with this SDG. No positive results were reported in T117-F6-SB-RB or T117-F8-SB-RB.

SDG IZ16: One rinsate blank was submitted with this SDG. No positive results were reported in T117-D7-SB-RB.

5.0 Surrogate Recovery: ACCEPTABLE/All criteria met

All samples were spiked with the surrogates 2-fluorobiphenyl and terphenyl-d14 prior to extraction. The surrogate %R values for all sample analyses met the acceptance criteria.

6.0 Matrix Spike/Matrix Spike Duplicate Sample Analyses: ACCEPTABLE/All criteria met

Matrix spike/matrix spike duplicate samples (MS/MSD) were analyzed at the proper frequency. All percent recovery and RPD values were within the QAPP specified control limits.

7.0 Laboratory Control Sample Analyses: ACCEPTABLE/All criteria met

A laboratory control sample (LCS) was analyzed at the proper frequency of one per extraction batch. All %R values met the QAPP acceptance criteria.

8.0 Internal Standards Performance: ACCEPTABLE/With the following discussion:

Qualified Data: See the **Qualified Data Summary Table**

Discussion:

An evaluation of areas and retention times for internal standards was performed as required. All retention times were within ±30 seconds of the associated CCAL internal standard retention time. The internal standard areas were within the specified acceptance limits of 50% to 200% of the associated CCAL internal standard area, with the following exceptions:

SDG IY35: The %R value for the internal standard perylene-d12 was 44% of the CCAL standard in Sample T117-B3-SB-02. This internal standard is used for quantitation of dibenz(a,h)anthracene, indeno(1,2,3-cd)pyrene and benzo(g,h,i)perylene only. This sample was re-analyzed at dilution, with all internal standards within control limits. No positive results for indeno(1,2,3-cd)pyrene,

dibenz(ah)anthracene, and benzo(g,h,i)perylene were detected for either analysis. The original results were reported and qualified as estimated (UJ-19). Reporting limits from the re-analysis had elevated reporting limits due to dilution. These were rejected (R-11) to denote that more appropriate results should be used.

SDG IY36: The %R value for the internal standard perylene-d12 was 48.5% of the CCAL standard in Sample T117-B4-SB-03. This internal standard is used for quantitation of dibenz(a,h)anthracene, indeno(1,2,3-cd)pyrene and benzo(g,h,i)perylene only. This sample was re-analyzed at dilution, with all internal standards within control limits. Results for indeno(1,2,3-cd)pyrene and benzo(g,h,i)perylene were taken from the diluted analysis. However, the result for dibenz(a,h)anthracene was diluted out from the re-analysis, the original result was reported and qualified as estimated (J-19). Results and reporting limits for all other analytes from the re-analysis were rejected (R-11).

SDG IY93: The %R values for perylene-d12 in Samples T117-C4-SB-5.0-6.5 (42.7%) and T117-C4-SB-6.5-8.0 (42.1%) were less than the lower control limit. These samples were reanalyzed at a dilution (3x), yielding all internal standard %R values within control limits. Both sets of results were submitted. The analytes quantitated using perylene-d12, dibenz(a,h)anthracene, indeno(1,2,3-cd)pyrene, and benzo(g,h,i)perylene, were not detected in the diluted analyses. The results for these three analytes were reported from the original analyses and qualified as estimated (UJ-19). The results for these compounds from the dilution analysis were rejected (R-11).

9.0 Compound Identification: ACCEPTABLE/All criteria met

All compound identifications were reviewed and are acceptable. No false positives or negatives were found.

10.0 Compound Quantitation and Reporting Limits: ACCEPTABLE/With the following discussion:

Qualified Data: See the **Qualified Data Summary Table**

Discussion:

SDGs IY78, IY86 & IY93: Several compound quantitation and reporting limit results were verified by recalculation. No transcription or calculation errors were found.

All SDGs: The reporting limits in some samples exceeded the target reporting limits specified in the QAPP, generally due to the laboratory using reduced sample volume or diluting the extracts based on screening data.

SDG IY36: Sample T117-B4-SB-02 required an additional dilution (5x) due to results for benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, and chrysene which exceeded the calibration range. Both sets of data were reported. The benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, and chrysene results were qualified as rejected (R-20) in the initial analysis. All other analytes in the dilution analysis were qualified as rejected (R-11).

SDG IY72: Sample T117-D6-SB-2.0-3.5 required an additional dilution (30x) due to results for acenaphthene, fluorene, phenanthrene, anthracene, fluoranthene, pyrene, benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, and benzo(a)pyrene which exceeded the calibration. The results for these compounds were rejected (R-20) in the initial analysis. The results for all other analytes in the dilution were rejected (R-11).

SDG IY93: Sample T117-C4-SB-3.5-5.0 was analyzed the initial analysis (10x) and (60x) dilutions due to high concentrations of phenanthrene, anthracene, fluoranthene, pyrene, benzo(a)anthracene, chrysene, benzo(b)fluoranthene, and benzo(a)pyrene. The results for these compounds were rejected (R-20). The results for all other analytes in the second dilution were rejected (R-11).

11.0 System Performance: ACCEPTABLE/All criteria met

No signs of degraded instrument performance were observed. The analytical systems were judged to have been in tune, within control, and stable during the course of these analyses.

V. OVERALL ASSESSMENT OF THE DATA

As was determined by this evaluation, the laboratory followed the specified analytical methods. Precision was acceptable, as demonstrated by the MS/MSD and field duplicate RPD values. Accuracy was also acceptable, as demonstrated by the surrogate, LCS, and MS/MSD recovery results.

Data were estimated because of CCAL %D outliers and internal standard outliers.

Data were rejected because the calibration linear range was exceeded and to indicate the most appropriate result from multiple reported results. A usable result remains for all analytes.

Rejected data should not be used for any purpose. All other data, as qualified, are acceptable for use.

DATA VALIDATION REPORT
Port of Seattle Terminal 117
Polychlorinated Biphenyl (PCB) Compounds
SW846 Method 8082

This report documents the review of the data from the analysis of soil samples and associated field and laboratory QC samples for PCB compounds. Samples were analyzed by Analytical Resources, Inc. (ARI), Tukwila, Washington. Refer to the **Sample Index** for a list of samples reviewed.

Sample Delivery Group SDG	Number of Samples	Level of Validation
IY32	20 SOIL SAMPLES	FULL
IY33	9 SOIL SAMPLES, 1 RINSATE	SUMMARY
IY35	19 SOIL SAMPLES	SUMMARY
IY36	9 SOIL SAMPLES, 1 RINSATE	SUMMARY
IY64	12 SOIL SAMPLES	SUMMARY
IY65	7 SOIL SAMPLES, 1 RINSATE	SUMMARY
IY71	13 SOIL SAMPLES	SUMMARY
IY72	15 SOIL SAMPLES, 1 RINSATE	SUMMARY
IY78	19 SOIL SAMPLES	FULL
IY79	5 SOIL SAMPLES	SUMMARY
IY82	16 SOIL SAMPLES, 2 RINSATES	SUMMARY
IY86	19 SOIL SAMPLES	FULL
IY93	13 SOIL SAMPLES, 2 RINSATES	SUMMARY
IZ04	13 SOIL SAMPLES	SUMMARY
IZ05	13 SOIL SAMPLES, 2 RINSATES	SUMMARY
IZ15	16 SOIL SAMPLES	SUMMARY
IZ16	10 SOIL SAMPLES, 1 RINSATE	SUMMARY
JA73	1 SOIL SAMPLE	SUMMARY

I. DELIVERABLES/DOCUMENTATION

The laboratory provided all necessary data and documentation to meet project quality assurance project plan (QAPP) requirements. Good documentation practices were observed by the laboratory in the following areas: manual integrations, changes and corrections were struck out by a single line with the entry initialed and dated by the analyst; no correction fluid or tape was found on the data; and proper units for numerical values were used.

SDG IY71: Sample T117-D5-SB-04 was not listed on the chain of custody. The sample was analyzed as per client request.

II. FIELD QUALITY CONTROL

SDG IY32: Samples T117-A7-SB-02 and T117-A7-SB-201 were submitted as field duplicates with this SDG. No results greater than the reporting limit were reported for either sample. Field precision was acceptable.

SDG IY33: Samples T117-A4-SB-03 and T117-A4-SB-202 were submitted as field duplicates with this SDG. The relative percent difference (RPD) value for Aroclor 1260 was less than the control limit of 75%. Field precision was acceptable.

SDG IY35: Two sets of field duplicates were submitted. No results greater than the reporting limit were reported in Samples T117-B2-SB-07 and T117-B2-SB-204. The RPD value for Aroclor 1260 in Samples T117-B6-SB-02 and T117-B6-SB-205 was less than the control limit of 75%. Field precision was acceptable.

SDG IY36: Samples T117-A10-SB-01 and T117-A10-SB-206 were submitted as field duplicates with this SDG. The RPD value for Aroclor 1260 was less than the control limit of 75%. Field precision was acceptable.

SDGs IY64 & IY71: Field duplicate T117-B7-SB-208 was submitted with IY71, and its parent sample, T117-B7-SB-8.0-9.5 was submitted with IY64. The RPD value for Aroclor 1260 was less than the control limit of 75%. Field precision was acceptable.

SDG IY72: Samples T117-D6-SB-11.0-12.5 and T117-D6-SB-210 were submitted as field duplicates with this SDG. The RPD value for Aroclor 1260 was less than the control limit of 75%. Field precision was acceptable.

SDG IY78: Two sets of field duplicates were submitted, Samples T117-D11-SB-06 & T117-D11-SB-211 and T117-E1-SB-6.5-8 and T117-E1-SB-212. For both sets the RPD values for Aroclor 1260 were less than the control limit of 75%. Field precision was acceptable.

SDG IY82: Samples T117-C3-SB-3 and T117-C3-SB-213 were submitted as field duplicates with this SDG. The RPD value for Aroclor 1260 (77%) exceeded the control limit of 75%. Qualification of data based on field duplicate results is not required.

SDG IZ04: Samples T117-B8-SB-02 and T117-B8-SB-214 were submitted as field duplicates with this SDG. The RPD value for Aroclor 1260 was less than the control limit of 75%. Field precision was acceptable.

See **Section 3.0** for a discussion of field blanks.

III. TECHNICAL DATA VALIDATION

1.0 Holding Times and Sample Receipt: ACCEPTABLE/With the following discussion:

Qualified Data: None

Discussion:

Field chain-of-custody (COC) forms were present and complete. No problems with sample receipt conditions were indicated on the field COC forms.

All SDGs: The temperatures of several sample coolers (ranging from 0.0°C to 6.7°C) were outside the control limit of 2.0°C to 6.0°C at sample receipt. Samples were received the same day as collection; therefore, the temperature outliers were judged to have no impact on the reported results.

SDG JA73: Sample T117-A12-SB-0.5-1.5 was maintained in frozen archive storage prior to extraction. The holding time is extended to one year.

2.0 Initial and Continuing Calibration: ACCEPTABLE/All criteria met

Five-point initial calibrations (ICAL) were performed. The percent relative standard deviation (%RSD) values were calculated correctly, and were acceptable.

Continuing calibrations (CCAL) were analyzed at the proper frequency. The percent difference (%D) values were calculated correctly and were within the acceptance criterion of 15%.

3.0 Blank Analyses: ACCEPTABLE/All criteria met

Method blanks were extracted and analyzed at the proper frequency. No Aroclors were detected in the method blanks at concentrations exceeding the reporting limit.

SDG IY33: One rinsate blank, Sample T117-A4-SB-RB, was submitted. No positive results were reported.

SDG IY36: One rinsate blank, Sample T117-B5-RB, was submitted. No positive results were reported.

SDG IY65: One rinsate blank, Sample T117-D8-SB-RB, was submitted. No positive results were reported.

SDG IY72: One rinsate blank, Sample T117-D6-SB-RB, was submitted. No positive results were reported.

SDG IY82: Two rinsate blanks, Samples T117-E2-SB-RB and T117-C3-SB-RB, were submitted. No positive results were reported in either blank.

SDG IY93: Two rinsate blanks, Samples T117-C1-SB-RB and T117-C5-SB-RB, were submitted. No positive results were reported in either blank.

SDG IZ05: Two rinsate blanks, Samples T117-F6-SB-RB and T117-F8-SB-RB, were submitted. No positive results were reported in either blank.

SDG IZ16: One rinsate blank, Sample T117-D7-SB-RB, was submitted. No positive results were reported.

4.0 Surrogate Recovery: ACCEPTABLE/With the following discussion:

Qualified Data: None

Discussion:

All samples were spiked with decachlorobiphenyl (DCBP) and tetrachloro-m-xylene (TCMX) prior to extraction. All surrogate percent recovery (%R) results were within control limits, with the exceptions noted below:

SDG IY32: DCBP in the initial analysis of Sample T117-A5-SB-02 was not recovered due to interference. The TCMX %R value was acceptable, and both the TCMX and DCPB %R results were acceptable in the dilution analysis of this sample. No qualifiers were assigned.

SDG IY78: The surrogates were not recovered in Sample T117-D11-SB-01 due to sample dilution (200X). No qualifiers were assigned.

SDG IY86: The %R value for DCBP in Sample T117-C6-SB-3.5-5.0 was greater than the upper control limit of 160%, at 244%. The %R value for TCMX was acceptable and qualification in not required when only one surrogate is outside of the control limits.

SDG IZ04: The %R value for DCBP in Sample T117-B8-SB-214 was greater than the upper control limit of 149%, at 154%. The TCMX %R value was acceptable and no qualifiers were assigned.

Due to sample dilution the surrogates were not recovered in the initial analysis of Sample T117-B8-SB-01 (100X) and the dilution analyses of Samples T117-B8-SB-01 (500X), T117-B8-SB-02 (100X), and T117-B8-SB-214 (100X). No qualifiers were assigned.

SDG IZ15: The surrogate DCBP was not recovered in Sample T117-F5-SB-05. The %R value for TCMX was acceptable and no qualifiers were assigned.

5.0 Laboratory Control Sample Analyses: ACCEPTABLE/All criteria met

A laboratory control sample (LCS) was analyzed at the proper frequency. All %R values were within acceptance limits.

6.0 Matrix Spike/Matrix Spike Duplicate Sample Analyses: ACCEPTABLE/With the following exceptions:

Qualified Data: None

Discussion:

Matrix Spike/Matrix Spike Duplicate samples (MS/MSD) were analyzed at the proper frequency. Percent recovery values were within the control limits, with the exceptions noted below. All RPD values were acceptable.

SDG IY82: The %R value from the MSD analysis associated with Sample T117-E2-SB-04-A was greater the upper control limit of 149% (at 154%). The %R values from the associated MS and LCS, were within the control limit; therefore no qualifier was assigned.

SDGs IZ04 and IZ05: The MS/MSD from SDG IY82 served as batch QC for the medium level extraction in these SDGs. No data were qualified based on the MS %R outlier.

7.0 Compound Identification: ACCEPTABLE/All criteria met

All compound identifications were reviewed and are acceptable. No false positives or negatives were found.

8.0 Compound Quantitation: ACCEPTABLE/All criteria met.

SDGs IY32, IY78, and IY86: Several compound quantitation and reporting limit results were verified by recalculation. No transcription or calculation errors were found.

9.0 Reporting Limits: ACCEPTABLE/With the following exceptions:

Qualified Data: See the **Qualified Data Summary Table**

Discussion:

Several samples were extracted at either medium level or with a reduced sample size due to high levels of target compounds and/or background interferences. Some samples required additional dilutions based or further elevation of the reporting limits based on background interference. Reporting limits were elevated accordingly.

Several samples required re-analysis at dilution due to high levels of Aroclors 1254 and 1260. The laboratory reported both sets of results in these cases. Results from the original analyses which were greater than the calibration range of the instrument were rejected (R-20). Results for the remaining Aroclors were rejected (R-11) in the dilution analyses to indicate that the results from the original analyses should be used. A usable result remains for all compounds for every sample. The following samples required dilution:

SDG IY32: T117-A5-SB-02 (10X) - Aroclors 1254 and 1260

SDG IY33: T117-A3-SB-01 (5x) - Aroclor 1260

SDG IY35: T117-B2-SB-04 (3x) - Aroclor 1260 and T117-B3-SB-01 (5x) - Aroclor 1260

SDG IY36: T117-B4-SB-01 (20x) - Aroclor 1260

SDG IY64: T117-B7-SB-11-12.5 (5x) - Aroclor 1260

SDG IY72: T117-D6-SB-5-6.5 (3x) - Aroclor 1260

SDG IY78: T117-D11-SB-04 (3x) - Aroclor 1260 and T117-E1-SB-12.5-14 (3x) - Aroclor 1260

SDG IY82: T117-C3-SB-02 (3x) - Aroclor 1260

SDG IY86: T117-C1-SB-03 (10x) - Aroclor 1260 and T117-C6-SB-5.0-6.5 (5x) - Aroclor 1260

Sample T117-C1-SB-05 was extracted at medium level and upon analysis was found to contain Aroclor 1260 at a concentration less than the reporting limit. The extract was concentrated (yielding an effective dilution factor of 0.25x). Both the initial and concentrated analyses were submitted. The results from the concentrated analysis were reported and the results from the initial analysis were rejected (R-11) to indicate they should not be used.

SDG IY93: T117-C4-SB-5.0-6.5 (5x) - Aroclor 1260

SDG IZ04: T117-B8-SB-01 (500x) - Aroclor 1260, T117-B8-SB-02 (100x) - Aroclor 1260, T117-B8-SB-214 (100x) - Aroclor 1260, T117-D9-SB-02 (5x) - Aroclor 1260, and T117-D10-SB-01 (10x) - Aroclor 1260

SDG IZ05: T117-F6-SB-03 (3x) - Aroclor 1260 and T117-F8-SB-02 (3x) - Aroclor 1260

SDG IZ15: T117-F4-SB-01 (3x) - Aroclor 1260, T117-F5-SB-01 (3x) - Aroclor 1260, and T117-F1-SB-02 (10x) - Aroclor 1260

SDG IZ16: The RPD between the two analytical columns was greater than the control limit of 40% for Aroclor 1260 in Samples T117-A11-SB-0.0-0.5 and T117-A12-SB-0.0-0.5. The laboratory flagged these results with a "P" and they were qualified as estimated (J-3).

SDG JA73: The reporting limits in the sample exceeded the project target reporting limits specified in the quality assurance project plan (QAPP). No action was taken other than to note the discrepancy.

10.0 System Performance: ACCEPTABLE/With the following discussion:

***Qualified Data*:** None

***Discussion*:**

SDG IY32: The area of internal standard hexabromobiphenyl was greater than the upper control limit on one column in the initial analysis of Sample T117-A5-SB-02. No positive results were reported from this analysis; therefore no qualification was necessary.

IV. OVERALL ASSESSMENT

Accuracy was acceptable, as demonstrated by the laboratory control sample, MS/MSD, and surrogate %R values, with the noted exceptions. Precision was also acceptable, as demonstrated by the LCS/LCSD, MS/MSD, and field duplicate RPD values, with the exception noted above.

Data were estimated due to confirmation criteria outliers. When more than one result was reported data were rejected so that only one result remained.

Data were rejected because the calibration range was exceeded and to indicate which result, from multiple reported results, should be used. A usable result remains for each analyte for every sample; therefore completeness is not affected.

Data that has been rejected should not be used for any purpose.

All other data, as qualified, are acceptable for use.

DATA VALIDATION REPORT
Port of Seattle Terminal 117
Diesel Range Organic Compounds
Method NWTPH-Dx

This report documents the review of the data from the analyses of soil samples for diesel range organic compounds. The sample was analyzed by Analytical Resources, Inc. (ARI), Tukwila, Washington. Refer to the **Sample Index** for a list of samples reviewed.

Sample Delivery Group SDG	Number of Samples	Level of Validation
IY32	20 SOIL SAMPLES	SUMMARY
IY33	9 SOIL SAMPLES, 1 RINSATE	SUMMARY
IY35	19 SOIL SAMPLES	SUMMARY
IY36	9 SOIL SAMPLES, 1 RINSATE	SUMMARY
IY64	3 SOIL SAMPLES	SUMMARY
IY65	3 SOIL SAMPLES	SUMMARY
IY71	13 SOIL SAMPLES	SUMMARY
IY72	15 SOIL SAMPLES, 1 RINSATE	SUMMARY
IY78	19 SOIL SAMPLES	FULL
IY79	5 SOIL SAMPLES	SUMMARY
IY82	15 SOIL SAMPLES, 2 RINSATES	SUMMARY
IY86	19 SOIL SAMPLES	FULL
IY93	13 SOIL SAMPLES, 2 RINSATES	SUMMARY
IZ04	12 SOIL SAMPLES	SUMMARY
IZ05	13 SOIL SAMPLES, 2 RINSATES	SUMMARY
IZ15	16 SOIL SAMPLES	SUMMARY
IZ16	9 SOIL SAMPLES, 1 RINSATE	SUMMARY

I. DELIVERABLES/DOCUMENTATION

The laboratory provided all necessary data and documentation to meet project QAPP requirements. Good documentation practices were observed by the laboratory in the following areas: manual integrations, changes and corrections were struck out by a single line with the entry initialed and dated by the analyst; no correction fluid or tape was found on the data; and proper units for numerical values were used.

SDG IY71: Sample T117-D5-SB-04 was not included on the chain-of-custody (COC). This sample was analyzed and results were reported by the laboratory as per client request.

II. FIELD QUALITY CONTROL

SDG IY32: Samples T117-A7-SB-02 & T117-A7-SB-201 were submitted as field duplicates with this SDG. The relative percent difference (RPD) values were less than the control limit of 75%. Field precision was acceptable.

SDG IY33: Samples T117-A4-SB-03 & T117-A4-SB-202 were submitted as field duplicates with this SDG. The RPD values were less than the control limit of 75%. Field precision was acceptable.

SDG IY35: Two sets of field duplicates, T117-B2-SB-07 & T117-B2-SB-204 and T117-B6-SB-02 & T117-B6-SB-205 were submitted with this SDG. The RPD values were less than the control limit of 75%. Field precision was acceptable.

SDG IY36: Samples T117-A10-SB-01 & T117-A10-SB-206 were submitted as field duplicates with this SDG. The RPD values were less than the control limit of 75%. Field precision was acceptable.

SDGs IY64 & IY71: Field duplicate T117-B7-SB208 was submitted with IY71, and its parent sample, T117-B7-SB-8.0-9.5 was submitted with IY64. There were no positive values for DRO or motor oil in either of these samples. Field precision was acceptable.

SDG IY72: Samples T117-D6-SB-11.0-12.5 & T117-D6-SB-210 were submitted as field duplicates with this SDG. The RPD values were less than the control limit of 75%. Field precision was acceptable.

SDG IY78: Samples T117-D11-SB-06 & T117-D11-SB-211 and T117-E1-SB-6.5-8.0 & T117-E1-SB-212 were submitted as field duplicates with this SDG. The RPD values were less than the control limit of 75%. Field precision was acceptable.

SDG IZ04: Samples T117-B8-SB-02 & T117-B8-SB-214 were submitted as field duplicates with this SDG. The RPD values were less than the control limit of 75%. Field precision was acceptable.

SDG IZ16: Samples T117-D7-SB-3.0-4.5 & T117-D7-SB-215 were submitted as field duplicates with this SDG. The RPD values were less than the control limit of 75%. Field precision was acceptable.

See **Section 3.0** for a discussion of field blanks.

III. TECHNICAL DATA VALIDATION

1.0 Holding Times and Sample Receipt: ACCEPTABLE/With the following discussion:

Qualified Data: None

Discussion:

Field chain-of-custody (COC) forms were present and complete. No problems with sample receipt conditions were indicated on the field COC forms.

All SDGs: The temperatures of several sample coolers (ranging from 0.0°C to 6.7°C) were outside the control limit of 2.0°C to 6.0°C at sample receipt. Samples were received the same day as collection; therefore, the temperature outliers were judged to have no impact on the reported results.

All samples were extracted and analyzed within the established holding time criteria.

2.0 Initial and Continuing Calibration: ACCEPTABLE/With the following exceptions:

Qualified Data: see the **Qualified Data Summary Table**

Discussion:

A six-point initial calibration (ICAL) was performed. The percent relative standard deviation (%RSD) values were calculated correctly, and were acceptable. Continuing calibrations (CCAL) were analyzed at the proper frequency. The percent difference (%D) values were calculated correctly and were within the acceptance criterion of 15%, with the exceptions below.

SDG IY32: The laboratory noted that the %D value for motor oil (15.3%) exceeded the control limit from the CCAL analyzed on 1/19/06. No action was taken as the %D value rounds to 15%.

SDG IY33: The laboratory noted that the %D value for motor oil (15.3%) exceeded the control limit from the CCAL analyzed on 1/19/06. The %D value for motor oil (26.5%) exceeded the control limit from the CCAL analyzed on 1/19/06. The motor oil results for Samples T117-A4-SB-01, T117-A4-SB-02, T117-A4-SB-03, and T117-A4-SB-202 were qualified as estimated (J-5B) to indicate a potential low bias.

SDGs IY64, IY82, & IY93: The %D value for motor oil (16.3%) exceeded the control limit from the CCAL analyzed on 1/29/06. The motor oil results for Samples T117-B7-SB-2.0-3.5, T117-B7-SB-3.5-5.0, T117-C8-SB-02, and T117-C4-SB-6.5-8.0 were qualified as estimated (J-5B) to indicate a potential low bias.

3.0 Blank Analyses: ACCEPTABLE/All criteria met

A method blanks was extracted and analyzed at the proper frequency. No diesel range organics were detected in the method blanks at concentrations greater than or equal to the reporting limit.

SDG IY33: One rinsate blank, T117-A4-SB-RB, was reported with this SDG. There were no positive results for DRO or motor oil in this field blank.

SDG IY36: One rinsate blank, T117-B5-RB, was reported with this SDG. There were no positive results for DRO or motor oil in this field blank.

SDG IY65: One rinsate blank, T117-D8-SB-RB, was reported with this SDG. There were no positive results for DRO or motor oil in this field blank.

SDG IY72: One rinsate blank, T117-D6-SB-RB, was reported with this SDG. There were no positive results for DRO or motor oil in this field blank.

SDG IY82: Two rinsate blanks, T117-E2-SB-RB and T117-C3-SB-RB, were reported with this SDG. There were no positive results for DRO or motor oil in these field blanks.

SDG IY93: Two rinsate blanks, T117-C1-SB-RB and T117-C5-SB-RB, were reported with this SDG. There were no positive results for DRO or motor oil in these field blanks.

SDG IZ05: Two rinsate blanks, T117-F6-SB-RB and T117-F8-SB-RB, were reported with this SDG. There were no positive results for DRO or motor oil in these field blanks.

SDG IZ16: One Rinsate blank, T117-D7-SB-RB, was reported with this SDG. There were no positive results for DRO or motor oil in these field blanks.

4.0 Surrogate Recovery: ACCEPTABLE/With the following discussion:

Qualified Data: None

Discussion:

All samples were spiked with o-terphenyl prior to extraction. All percent recoveries (%R) were within the laboratory (and QAPP) acceptance criteria.

The surrogate values for o-terphenyl were not reported for the samples below because the samples were diluted at factors of 10x or greater. These dilutions, combined with the high concentrations of diesel and/or motor oil in the samples made it impossible to accurately quantitate the surrogate levels. No further action was taken.

SDG IY72: T117-D6-SB-5.0-6.5 and T117-D6-SB-6.5-8.0

SDG IY78: T117-D11-SB-01, T117-E1-SB-2.0-3.5, T117-E1-SB-3.5-5.0, and T117-E1-SB-5.0-6.5-A

SDG IY79: T117-C7-SB01 and T117-C7-SB02

SDG IY82: T117-C8-SB01 and T117-F3-SB-03

SDG IY86: T117-C1-SB-02, T117-C1-SB-03, T117-C2-SB-03, T117-C6-SB-3.5-5.0, T117-C6-SB-5.0-6.5, and T117-C6-SB-6.5-8.0

SDG IY93: T117-C4-SB-3.5-5.0 and T117-C4-SB-5.0-6.5

SDG IZ04: T117-B8-SB-01 and T117-D10-SB-01

5.0 Laboratory Control Sample Analyses: ACCEPTABLE/All criteria met

A laboratory control sample (LCS) was analyzed at the proper frequency of one per extraction batch. All %R values met the laboratory (and QAPP) acceptance criteria.

6.0 Matrix Spike/Matrix Spike Duplicate Sample Analyses: ACCEPTABLE/ with the following discussion:

Qualified Data: None

Discussion:

Matrix Spike/Matrix Spike Duplicate samples (MS/MSD) were analyzed at the proper frequency. The %R values and relative percent difference (RPD) values were within the acceptance limits, with the following exceptions:

SDG IY35: An MS/MSD analysis was performed using Sample T117-B1-SB-01. The laboratory did not report percent recovery (%R) values because the native sample concentration was much greater than 4 times the amount spiked into the sample. The RPD value was within limits.

SDG IZ05: An MS/MSD analysis was performed using Sample T117-F6-SB-03. The %R value for the MSD (152%) exceeded the upper control limit of 130%. Since the MS %R and LCS %R values were within the control limits, accuracy was judged to be acceptable. No action was taken.

7.0 Compound Identification: ACCEPTABLE/With the following discussion:

Qualified Data: See the **Qualified Data Summary Table**

Discussion:

All compound identifications were reviewed and are acceptable. No false positives or negatives were found.

SDG IY35: The chromatographic pattern for Sample T117-B6-SB-01 did not match those of the diesel or motor oil standards used for calibration. These results were qualified as estimated (J-2).

SDG IY64: The chromatographic patterns for all samples in this SDG did not match those of the diesel or motor oil standards used for calibration. These results were qualified as estimated (J-2).

SDG IZ04: The chromatographic patterns for Samples T117-B8-SB-01, T117-B8-SB-02, T117-B8-SB-214, T117-E3-SB-01, and T117-E3-SB-02 in this SDG did not match those of the diesel or motor oil standards used for calibration. These results were qualified as estimated (J-2).

8.0 Compound Quantitation: ACCEPTABLE/All criteria met

SDGs IY78 & IY86: Several compound quantitations and reporting limits were verified by recalculation. No transcription or calculation errors were found.

SDG IY82: The laboratory incorrectly recorded the final volume of sample extracts for T117-E2-SB-02, T117-E2-SB-03, T117-E2-SB-04-A, and T117-E2-SB-04-B. The laboratory corrected the error, and all surrogate %R values were resolved to be within control limits.

9.0 Reporting Limits: ACCEPTABLE/With the following discussion:

Qualified Data: None

Discussion:

Several samples were analyzed at dilution due to high concentrations of hydrocarbons. Reporting limits were elevated accordingly.

IV. OVERALL ASSESSMENT

Accuracy was acceptable, as demonstrated by the LCS, MS/MSD, and surrogate %R values, with the exceptions previously noted. Precision was also acceptable, as demonstrated by the MS/MSD and field duplicate RPD values.

Data were qualified as estimated because of CCAL %D outliers and because the chromatographic patterns did not match the calibration standards.

All data, as qualified, are acceptable for use.

DATA VALIDATION REPORT
Port of Seattle Terminal 117
Gasoline Range Organic Compounds
Method NWTPH-Gx
SDGs: IZ04

This report documents the review of the data from the analyses of one soil sample for gasoline range organic compounds. The sample was analyzed by Analytical Resources, Inc. (ARI), Tukwila, Washington. Summary (Level III) validation was performed on the data. Refer to the **Sample Index** for field and laboratory IDs.

I. CHAIN-OF-CUSTODY

The laboratory provided all necessary data and documentation to meet project quality assurance program plan (QAPP) requirements. Good documentation practices were observed by the laboratory in the following areas: manual integrations, changes and corrections were struck out by a single line with the entry initialed and dated by the analyst; no correction fluid or tape was found on the data; and proper units for numerical values were used.

II. DELIVERABLES/DOCUMENTATION

The laboratory provided all necessary data and documentation to meet project QAPP requirements. Good documentation practices were observed by the laboratory in the following areas: changes and corrections were struck out by a single line with the entry initialed and dated by the analyst; correction fluid or tape was not found on any of the data; and proper units for numerical values were used.

III. FIELD QUALITY CONTROL

One rinsate, T117-D8-SB-RB, was submitted for HCID analysis in SDG IY65. This sample was not analyzed for TPH-Gx as the HCID results did not indicate the presence of gasoline range hydrocarbons at concentrations greater than the detection limit.

IV. Technical Assessment

1.0 Sample Holding Times: ACCEPTABLE/All criteria met

The method holding time criterion for soil samples is 14 days from date of collection until date of preparation. The sample was analyzed within the holding time criterion.

2.0 Initial and Continuing Calibration: ACCEPTABLE/All criteria met

A six or seven point initial calibration (ICAL) was performed using a response factors model. The calibration was recalculated with no errors found.

Continuing calibrations (CCAL) were analyzed at the proper frequency of one every ten samples. The percent difference (%D) values were calculated correctly, and were acceptable.

3.0 Blank Analyses: ACCEPTABLE/All criteria met

A method blank was extracted and analyzed at the proper frequency. No gasoline range hydrocarbons were detected in the method blank at concentrations greater than or equal to the reporting limit.

4.0 Surrogate Recovery: ACCEPTABLE/All criteria met

The sample was spiked with trifluorotoluene and bromobenzene prior to extraction. All percent recoveries (%R) were within the laboratory (and QAPP) acceptance criteria.

5.0 Matrix Spike/Matrix Spike Duplicate Analyses: ACCEPTABLE/All criteria met

Matrix Spike/Matrix Spike duplicate samples (MS/MSD) were analyzed at the proper frequency. All %R values and relative percent difference (RPD) values were within the acceptance limits.

6.0 Laboratory Control Sample/Laboratory Control Sample Duplicate Analyses: ACCEPTABLE/All criteria met

Laboratory Control Spike/Laboratory Control Spike duplicate samples (LCS/LCSD) were analyzed at the proper frequency. All %R and RPD values were within the acceptance limits.

7.0 Compound Quantitation and Reporting Limits: ACCEPTABLE/With the following exceptions:

Qualified Data: See the **Data Qualifier Summary Table**

Discussion:

The chromatographic pattern in Sample T117-B8-SB-01 did not match that of the gasoline standard used for calibration. The laboratory performed further analysis to better identify the peaks. The gasoline result in this sample was estimated (J-2).

V. OVERALL ASSESSMENT OF THE DATA

As was determined by this evaluation, the laboratory followed the specified analytical methods. Precision was acceptable, as demonstrated by LCS/LCSD and MS/MSD RPD values. Accuracy was also acceptable, as demonstrated by the acceptable surrogate, LCS/LCSD, and MS/MSD %R results.

Data were qualified as estimated due to the chromatographic pattern of the sample not matching that of the calibration standards.

All data, as qualified, are acceptable for use.

DATA VALIDATION REPORT
Port of Seattle Terminal 117
Hydrocarbon Identification
Method NWTPH-HCID

This report documents the review of the data from the qualitative analyses of soil samples for hydrocarbon identification. The samples were analyzed by Analytical Resources, Inc. (ARI), Tukwila, Washington. Refer to the **Sample Index** for a list of samples reviewed.

Sample Delivery Group SDG	Number of Samples	Level of Validation
IY64	12 SOIL SAMPLES	SUMMARY
IY65	4 SOIL SAMPLES, 1 RINSATE	SUMMARY
IZ04	4 SOIL SAMPLES	SUMMARY

I. DELIVERABLES/DOCUMENTATION

The laboratory provided all necessary data and documentation to meet project quality assurance program plan (QAPP) requirements. Good documentation practices were observed by the laboratory in the following areas: manual integrations, changes and corrections were struck out by a single line with the entry initialed and dated by the analyst; no correction fluid or tape was found on the data; and proper units for numerical values were used.

II. FIELD QUALITY CONTROL

SDG IZ04: Samples T117-B8-SB-02 & T117-B8-SB-214 were submitted as field duplicates with this SDG. The results were in agreement, although no relative percent difference (RPD) values could be calculated as this method is designed to be only a qualitative screening analysis.

See section **3.0** for a list of field blanks.

III. TECHNICAL DATA VALIDATION

1.0 Holding Times and Sample Receipt: ACCEPTABLE/With the following discussion:

Qualified Data: None

Discussion:

Field chain-of-custody (COC) forms were present and complete. No problems with sample receipt conditions were indicated on the field COC forms.

SDGs IY64 & IY65: The temperature of the sample cooler (at 6.7°C) was outside the control limits of 2.0°C to 6.0°C. Samples were received the same day as collection; therefore, the temperature outliers were judged to have no impact on the reported results.

2.0 Initial Calibration: ACCEPTABLE/All criteria met

Single-point initial calibrations (ICAL) for gasoline range, diesel range, and motor oil range hydrocarbons were performed. Sample responses were correctly compared to the responses of the single-point calibrations in order to positively identify the above mentioned hydrocarbon ranges.

3.0 Blank Analyses: ACCEPTABLE/All criteria met

Method blanks were extracted and analyzed at the proper frequency. No gasoline range, diesel range, or motor oil range hydrocarbons were detected in the method blanks at concentrations greater than or equal to the reporting limits.

SDG IY65: One rinsate blank T117-D8-SB-RB, was reported with this SDG. There were no positive results for gasoline range, diesel range, or motor oil range hydrocarbons in this field blank.

4.0 Surrogate Recovery: ACCEPTABLE/With the following discussion:

Qualified Data: None

Discussion:

All samples were spiked with o-terphenyl prior to extraction. All percent recoveries (%R) were within the laboratory (and QAPP) acceptance criteria.

SDG IZ04: The surrogate value for o-terphenyl was not reported for Sample T117-B8-SB-01 because the concentration of petroleum hydrocarbons made it impossible to accurately quantitate the surrogate level. No qualifier was applied.

5.0 Laboratory Duplicate Sample Analyses: ACCEPTABLE/All criteria met

Laboratory duplicate samples were analyzed at the proper frequency of one every ten samples. The laboratory duplicates were checked for the confirmation of gasoline range, diesel range, and motor oil hydrocarbon ranges. No RPD values were calculated, as this method is designed to be only a qualitative analysis.

In cases where there was not enough sample mass or volume to properly analyze a sample duplicate, Laboratory Control Sample/Laboratory Control Sample Duplicates (LCS/LCSD) were analyzed.

6.0 Compound Identification: ACCEPTABLE/All criteria met

All qualitative identifications were reviewed and are acceptable. There were many sample chromatograms that indicated the presence of PCB compounds. However, because the sample chromatograms **also** indicated the presence of petroleum hydrocarbons, it was judged that the laboratory correctly identified the sample contents in terms of hydrocarbon ranges (which is exclusively what this method is designed to do). No false positives or negatives were found.

IV. OVERALL ASSESSMENT

Accuracy was acceptable, as demonstrated by the surrogate %R values. Precision was also acceptable, as demonstrated by the laboratory duplicate and field duplicate results.

All data, as reported, are acceptable for use.

DATA VALIDATION REPORT
Port of Seattle Terminal 117
Organochlorine Pesticide Compounds
SW846 Method 8081A
SDGs: IY82 and IY93

This report documents the review of the data from the analysis of soil samples for pesticide compounds. The samples were analyzed by Analytical Resources, Inc. (ARI), Tukwila, Washington. Full (Level IV) validation was performed on IY82 and summary (Level III) validation was performed on IY93. Refer to the **Sample Index** for sample identification.

I. CHAIN-OF-CUSTODY

Field chain-of-custody (COC) forms were present and complete. No problems with sample receipt conditions were indicated on the field COC form. The cooler temperatures were within the control limits of 2° to 6°C.

SDG IY93: Pesticide analysis was not requested on the COC for the samples in this SDG. The data were validated and no further action was taken.

II. DELIVERABLES/DOCUMENTATION

Good documentation practices were observed by the laboratory in the following areas: manual integrations, changes and corrections were struck out by a single line with the entry initialed and dated by the analyst; correction fluid or tape was not found on any of the data; and proper units for numerical values were used.

III. FIELD QUALITY CONTROL

SDG IY82: Samples T117-C3-SB-03 and T117-C3-SB-213 were submitted as field duplicates. No positive results were reported in either sample. Field precision was acceptable.

IV. TECHNICAL ASSESSMENT

1.0 Sample Holding Times: ACCEPTABLE/ All criteria met

The QAPP-required holding time criterion for soil samples is 14 days from date of sampling to date of extraction. The QAPP-required holding time criterion for all extracts is 40 days from extraction to analysis. All samples were extracted and analyzed within the holding time criteria.

2.0 Initial and Continuing Calibration: ACCEPTABLE/All criteria met

A five-point initial calibration (ICAL) was performed. The percent relative standard deviations (%RSD) were calculated correctly, and were within the control limit.

Continuing calibrations (CCAL) were analyzed at the proper frequency. The percent differences (%D) were within the method control limit of ±15%.

3.0 Blank Analyses: ACCEPTABLE/With the following discussion:

Qualified Data: None

Discussion:

A method blank was extracted and analyzed at the proper frequency. No target analytes were detected in the method blank at concentrations exceeding the reporting limit.

SDG IY82: One rinsate blank, Sample T117-C3-SB-RB, was submitted. No positive values were reported for the analytes of interest.

4.0 Surrogate Recovery: ACCEPTABLE/With the following discussion:

Qualified Data: None

Discussion:

The percent recovery (%R) values for all sample analyses met the acceptance criteria, with the exception noted below:

SDG IY93: The surrogate decachlorobiphenyl was not recovered in Sample T117-C4-SB-3.5-5.0 due to background interferences. The %R value for tetrachloro-meta-xylene was acceptable; therefore no qualifiers were assigned.

5.0 Laboratory Control Sample Analyses: ACCEPTABLE/All criteria met

A laboratory control sample (LCS) was analyzed at the proper frequency of one per analytical batch. All %R values were within laboratory (and QAPP) acceptance limits.

6.0 Matrix Spike/Matrix Spike Duplicate Sample Analyses: ACCEPTABLE/ With the following discussion:

Qualified Data: None

Discussion:

Matrix spike/matrix spike duplicates (MS/MSD) were performed at the proper frequency. The %R and relative percent difference (RPD) values met the QAPP acceptance criteria, with the exception noted below:

SDG IY93: The RPD value for 4,4´-DDT (40.8%) exceeded the control limit of 30% in the MS/MSD performed on Sample T117-C4-SB-8.0-9.5. This compound was not reported in the parent sample. Reporting limits were judged to be unaffected; therefore no qualifiers were assigned.

7.0 Compound Identification: ACCEPTABLE/All criteria met

All compound identifications were reviewed and are acceptable. No false positives or negatives were found.

8.0 Compound Quantitation and Reporting Limits: ACCEPTABLE/With the following discussion:

Qualified Data: None

Discussion:

SDG IY82: The reporting limits for dieldrin and 4,4´-DDT in Samples T117-C3-SB-01 and T117-C3-SB-02 and for 4,4´-DDT in Sample T117-C3-CB-213 were elevated by the laboratory due to chromatographic interference.

Several results were verified by recalculation from the raw data. No calculation or transcription errors were found.

SDG IY93: The reporting limits for dieldrin and 4,4´-DDT in Samples T117-C4-SB-5.0-6.5, T117-C4-SB-8.0-9.5, and T117-C4-SB-12.5-14.0 were elevated by the laboratory due to chromatographic interference.

9.0 System Performance: ACCEPTABLE/All criteria met

No signs of degraded instrument performance were observed. The analytical systems were judged to have been within control and stable during the course of these analyses.

V. OVERALL ASSESSMENT OF THE DATA

As was determined by this evaluation, the laboratory followed the specified analytical methods. Precision was acceptable, as demonstrated by the MS/MSD and field duplicate RPD values, with the exception noted above. Accuracy was also acceptable, as demonstrated by the surrogate, MS/MSD and LCS recovery results, with the exception previously noted.

No data were qualified for any reason.

All data, as reported, are acceptable for use.

DATA VALIDATION REPORT
Port of Seattle Terminal 117
Total Metals Analyses
SW846 Method 6010B

This report documents the review of the data from the analysis of soil samples for total metals. The samples were analyzed by Analytical Resources, Inc. (ARI), Tukwila, Washington. Refer to the **Sample Index** for a complete list of samples reviewed.

Sample Delivery Group SDG	Number of Samples	Level of Validation
IY32	3 SOIL SAMPLES	SUMMARY
IY33	4 SOIL SAMPLES, 1 RINSATE	SUMMARY
IY35	4 SOIL SAMPLES	SUMMARY
IY64	12 SOIL SAMPLES	SUMMARY
IY65	4 SOIL SAMPLES, 1 RINSATE	SUMMARY
IY71	4 SOIL SAMPLES	SUMMARY
IY72	15 SOIL SAMPLES, 1 RINSATE	FULL
IY78	18 SOIL SAMPLES	SUMMARY
IY79	5 SOIL SAMPLES	FULL
IY82	15 SOIL SAMPLES, 1 RINSATE	SUMMARY
IY86	7 SOIL SAMPLES	SUMMARY
IY93	13 SOIL SAMPLES	SUMMARY
IZ04	13 SOIL SAMPLES	SUMMARY
IZ16	8 SOIL SAMPLES, 1 RINSATE	SUMMARY

I. DELIVERABLES/DOCUMENTATION

All necessary data and documentation were provided by the laboratory to meet project quality assurance program plan (QAPP) requirements. Good documentation practices were observed by the laboratory in the following areas: changes and corrections were struck out by a single line with the entry initialed and dated by the analyst; correction fluid or tape was not found on any of the raw data; and proper units for numerical values were used.

SDG IY71: One sample, T117-D5-SB-04, was received but was not listed on the COC. The sample was logged in for analyses based on the containers received and Windward was informed of the omission.

II. FIELD QUALITY CONTROL

SDG IY33: One field duplicate pair, T117-A4-SB-03 and T117-A4-SB-202, was submitted with this SDG. The relative percent difference (RPD) values were less than the control limit of 75%. Field precision was acceptable.

SDGs IY64 and IY71: One field duplicate, T117-B7-SB-208, was submitted with SDG IY71. The corresponding sample, T117-B7-SB-8.0-9.5, was submitted in SDG IY64. The RPD values were less than the control limit of 75%. Field precision was acceptable.

SDG IY72: The data for one set of field duplicates, T117-D6-SB-209 & T117-D6-SB-9.5-11.0, were submitted. The RPD values were less than the QAPP specified control limit of 75%. Field precision was acceptable.

SDG IY78: One field duplicate pair, T117-D11-SB-211 and T117-D11-SB-06, was submitted with this SDG. The RPD values were less than the control limit of 75%. Field precision was acceptable.

SDG IZ04: One field duplicate pair, T117-B8-SB-02 and T117-B8-SB-214, was submitted with this SDG. The RPD values were less than the control limit of 75%. Field precision was acceptable.

See **Section 3.0** for a discussion of field blanks.

III. TECHNICAL ASSESSMENT

1.0 Holding Times and Sample Receipt: ACCEPTABLE/With the following discussion:

Qualified Data: None

Discussion:

Field chain-of-custody (COC) forms were present and complete, except where noted below. No problems with sample receipt conditions were indicated on the field COC forms. Some samples arrived in coolers with temperatures outside the recommended temperature range of 4º C +/- 2 ºC. Samples were received the same day as collection; therefore, the temperature outliers were judged to have no impact on the reported results. All samples were analyzed within the required holding time criteria.

2.0 Initial and Continuing Calibration: ACCEPTABLE/All criteria met

The minimum number of standards required for initial calibrations were analyzed by the laboratory.

The laboratory analyzed initial calibration verification (ICV) and continuing calibration verification (CCV) standards at the required frequencies. The percent recovery (%R) values of the ICV and CCV standards associated with the reported sample results were within the method-specific control limits.

The laboratory also analyzed a contract required detection limit (CRDL) sample at the required frequency. The %R values were within the specified control limits.

3.0 Blank Analyses: ACCEPTABLE/With the following discussion:

Qualified Data: None

Discussion:

Two types of laboratory blanks were evaluated for possible contamination effects. These blanks were: calibration blanks (ICB and CCB) and preparation blanks (PB).

The required frequency of one calibration blank at the beginning and one every ten samples was met. The laboratory analyzed one preparation blank for every 20 samples digested or one per batch, for each digestion procedure, as required.

SDG IY33: One rinsate blank, T117-A4-SB-RB, was submitted and analyzed with this SDG. No analytes of interest were detected in this blank.

SDG IY65: Zinc was detected in the soil preparation blank at a level greater than the detection limit. To evaluate the effect on the samples, an action level of five times the blank concentration was established. All zinc results were greater than the action level; therefore no qualification of results was necessary.

One rinsate blank, T117-D8-SB-RB, was submitted and analyzed with this SDG. No analytes of interest were detected in this blank.

SDG IY72: One rinsate blank, T117-D6-SB-RB, was submitted and analyzed with this SDG. No analytes of interest were detected in this blank.

SDG IY82: One rinsate blank, T117-E2-SB-RB, was submitted and analyzed with this SDG. No analytes of interest were detected in this blank.

SDG IZ16: One rinsate blank, T117-D7-SB-RB, was submitted and analyzed with this SDG. No analytes of interest were detected in this blank.

4.0 ICP Interference Check Sample Analyses: ACCEPTABLE/With the following discussion:

Qualified Data: None

Discussion:

Interference check samples (ICS) were analyzed only at the beginning of the ICP analytical sequence. The %R values of all reported analytes were within the control limits of 80% to 120%. No action was taken based on the absence of closing ICS samples.

Several samples contained concentrations of the interfering element iron at levels greater than in the ICS solutions. In these cases, the ICSA and ICSAB results were carefully evaluated. All ICSA results for unspiked analytes were less than the MDL indicating that no significant interferences were present.

5.0 Matrix Spike Sample Analyses (Percent Recovery Values): ACCEPTABLE/With the following exceptions:

Qualified Data: See the **Data Qualifier Summary Table**

Discussion:

Matrix spike samples (MS) were prepared and analyzed at the required frequency (one per batch). For sample results less than four times the spike added, the QAPP specified recovery limits are 70%-130%. For %R values greater than 130%, positive reported results are qualified as estimated (J-8) to indicate a possible high bias. For %R values less than 70%, reported results are qualified as estimated (J/UJ-8) to indicate a possible low bias.

SDG IY82: The %R value for lead (137%) was greater than the upper control limit of 125%.

SDG IZ04: The %R values for arsenic (65.1%), copper (57.8%) and lead (58.1%) were less than the lower control limit of 75%.

6.0 Laboratory Duplicate Sample Analyses (Relative Percent Difference Values): ACCEPTABLE/With the following exceptions:

Qualified Data: See the **Qualified Data Summary Table**

Discussion:

A laboratory duplicate was prepared at the required frequency (one per batch). The relative percent difference (RPD) values were used to evaluate laboratory precision. The RPD values were less than the QAPP specified control limit of 30% for sample results greater than 5 times the reporting limit, with the following exceptions:

SDG IY72: The RPD value for chromium (31%) was greater than the control limit. All associated results were qualified as estimated (J-9).

SDG IY82: The RPD values for copper (78.6%) and zinc (82.8%) were greater than the control limit of 30%. Also, the concentration of arsenic was less than five times the reporting limit (RL) while the difference between the sample and duplicate was greater than two times the RL. All associated results were qualified as estimated (J/UJ-9).

7.0 Laboratory Control Sample Analyses: ACCEPTABLE/All criteria met

A laboratory control sample (LCS) was analyzed at the proper frequency (one per batch) for each matrix. All %R values were within the manufacturer's certified acceptance limits.

8.0 ICP Serial Dilution: NOT PERFORMED/Not evaluated

An ICP serial dilution sample was not analyzed. Any significant physical or chemical interferences due to sample matrix could not be determined.

9.0 Reported Results: ACCEPTABLE/All criteria met

SDGs IY72 & IY79: Several results were verified by recalculation from the raw data. No calculation or transcription errors were noted.

IV. OVERALL ASSESSMENT OF THE DATA

As was determined by this evaluation, the laboratory followed the specified analytical methods. Precision was acceptable, as demonstrated by the laboratory and field duplicate RPD values, except as noted above. Accuracy was also acceptable, as demonstrated by the LCS and MS %R values, except as previously noted.

Data were qualified based on MS %R and laboratory duplicate RPD outliers.

All data, as qualified, are acceptable for use.

DATA VALIDATION REPORT
Port of Seattle Terminal 117
Conventional Parameter Analyses

This report documents the review of the data from the analysis of soil samples for total organic carbon (TOC) and grain size. Samples were analyzed by Analytical Resources, Inc. (ARI), Tukwila, Washington. Refer to the **Sample Index** for a list of samples reviewed.

Sample Delivery Group SDG	Number of Samples	Level of Validation
IY32	6 TOC & 1 GRAIN SIZE SOIL SAMPLES	FULL
IY33	3 TOC & 1 GRAIN SIZE SOIL SAMPLES	SUMMARY
IY35	5 TOC SOIL SAMPLES	SUMMARY
IY36	4 TOC & 1 GRAIN SIZE SOIL SAMPLES	SUMMARY
IY64	2 TOC & 1 GRAIN SIZE SOIL SAMPLES	SUMMARY
IY65	3 TOC SOIL SAMPLES	SUMMARY
IY71	3 TOC & 1 GRAIN SIZE SOIL SAMPLES	SUMMARY
IY72	1 TOC SOIL SAMPLE	SUMMARY
IY78	2 TOC SOIL SAMPLES	SUMMARY
IY79	1 TOC & 1 GRAIN SIZE SOIL SAMPLES	SUMMARY
IY82	4 TOC SOIL SAMPLES	SUMMARY
IY86	3 TOC & 5 GRAIN SIZE SOIL SAMPLES	FULL
IY93	2 TOC SOIL SAMPLES	SUMMARY
IZ04	4 TOC SOIL SAMPLES	SUMMARY
IZ05	4 TOC SOIL SAMPLES	SUMMARY
IZ15	4 TOC & 4 GRAIN SIZE SOIL SAMPLES	SUMMARY
IZ16	3 TOC SOIL SAMPLES	SUMMARY

The analytical tests that were performed are summarized below:

Parameter	Method
Total Solids (Done on all soils)	160.3
Grain Size	PSEP 1986
Total Organic Carbon (TOC)	Plumb, 1981

I. DELIVERABLES/DOCUMENTATION

The laboratory provided all necessary data and documentation to meet project quality assurance program plan (QAPP) requirements. Good documentation practices were observed by the laboratory in the following areas: manual integrations, changes and corrections were struck out by a single line with the entry initialed and dated by the analyst; correction fluid or tape was not found on any of the data; and proper units for numerical values were used.

SDG IY32, IY33, & IY36: The grain size summary forms for these SDGs incorrectly list results for Sample T117-A4-SB-03. The client submitted revised summaries with the correct sample ID, which is T117-A9-SB-03.

SDG IZ04: The laboratory analyzed Sample T117-D10-SB-02 for Total Organic Carbon (TOC). This test was not requested on the chain of custody (COC).

SDG IZ15: The laboratory analyzed Sample T117-F5-SB-01 for TOC. This test was not requested on the COC.

II. FIELD QUALITY CONTROL

SDG IY32: One field duplicate set, T117-A7-SB-02 & T117-A7-SB-201, was submitted and analyzed for total solids. The relative percent difference (RPD) value was less than the QAPP specified control limit of 75%. Field precision was acceptable.

SDG IY33: One field duplicate set, T117-A4-SB-03 & T117-A4-SB-202, was submitted and analyzed for total solids. The RPD value was less than the QAPP specified control limit of 75%. Field precision was acceptable.

SDG IY35: Two field duplicate sets, T117-B2-SB-01 & T117-B2-SB-203, and T117-B2-SB-07 & T117-B2-SB-204, were submitted and analyzed for total solids and total organic carbon. The RPD values were less than the QAPP specified control limit of 75%. Field precision was acceptable. One additional field duplicate set, T117-B6-SB-02 and T117-B6-SB-205, was submitted and analyzed for total solids. The RPD value was acceptable.

SDG IY36: One field duplicate set, T117-A10-SB-01 & T117-A10-SB-206, was submitted and analyzed for total solids and total organic carbon. The RPD values were less than the QAPP specified control limit of 75%. Field precision was acceptable.

SDGs IY64, IY65 & IY71: Two field duplicate sets, T117-B7-SB-8.0-9.5 & T117-B7-SB-208 and T117-D1-SB-01 & T117-D1-SB-207, were submitted with these SDGs. The first pair was analyzed for total solids. The second pair was analyzed for total solids and total organic carbon. The RPD values were less than the QAPP specified control limit of 75%. Field precision was acceptable.

SDG IY72: Two field duplicate sets, T117-D6-SB-209 & T117-D6-SB-9.5-11.0 and T117-D6-SB-210 & T117-D6-SB-11.0-12.5, were submitted and analyzed for total solids and total organic carbon. The RPD values were less than the QAPP specified control limit of 75%. Field precision was acceptable.

SDG IY78: Two field duplicate sets, T117-D11-SB-06 & T117-D11-SB-211 and T117-E1-SB-6.5-8.0 & T117-E1-SB-212, were submitted and analyzed for total solids. The RPD values were less than the QAPP specified control limit of 75%. Field precision was acceptable.

SDG IY82: One field duplicate set, T117-C3-SB-03 & T117-C3-SB-213, was submitted and analyzed for total solids. The RPD value was less than the QAPP specified control limit of 75%. Field precision was acceptable.

SDG IZ04: One field duplicate set, T117-B8-SB-02 & T117-B8-SB-214, was submitted and analyzed for total solids. The RPD value was less than the QAPP specified control limit of 75%. Field precision was acceptable.

SDG IZ16: One field duplicate set, T117-D7-SB-3.0-4.5 & T117-D7-SB-215, was submitted and analyzed for total solids. The RPD value was less than the QAPP specified control limit of 75%. Field precision was acceptable.

III. TECHNICAL ASSESSMENT

1.0 Holding Times and Sample Receipt Conditions: ACCEPTABLE/With the following discussion:

Qualified Data: None

Discussion:

The recommended holding time is 28 days for TOC, seven days for Total Solids and 180 days for Grain Size. All of these holding times were met.

Some samples arrived with cooler temperatures outside the recommended temperature range of 4º C +/- 2 ºC. Samples were received the same day as collection; therefore, the temperature outliers were judged to have no impact on the reported results.

2.0 Initial and Continuing Calibration: ACCEPTABLE/All criteria met

Initial calibrations were performed and calibration factors or calibration curves were calculated correctly, and were acceptable.

Continuing calibrations were analyzed at the proper frequency. The percent recovery (%R) values were calculated correctly, and were acceptable.

3.0 Blank Analyses: ACCEPTABLE/All criteria met

Method blanks were analyzed at the proper frequency. No analytes were detected in the method blanks at concentrations greater than or equal to the reporting limit.

Calibration blanks (ICB and CCB) were also analyzed. The required frequency of one calibration blank at the beginning and one every ten samples was met by the laboratory. No analytes were detected in these blanks at concentrations greater than or equal to the reporting limit.

4.0 Laboratory Control Sample Analyses: ACCEPTABLE/All criteria met

A laboratory control sample (LCS) and a standard reference materials (SRM) were analyzed for TOC. Analyses were done at the proper frequency of one per analytical batch. All recoveries were within the manufacturer's certified acceptance limits.

5.0 Matrix Spike Sample Analyses: ACCEPTABLE/All criteria met

The analysis of a matrix spike is required for the TOC analyses. A matrix spike was analyzed at the proper frequency of one per analytical batch. The %R value was within the acceptance limits of 70%-130%.

6.0 Laboratory Triplicate Sample Analyses (Relative Standard Deviation Values): ACCEPTABLE/All criteria met

A triplicate sample was analyzed at the proper frequency of one per analytical batch. The relative percent standard deviation (RSD) values were within the control limit of 30%.

7.0 Reported Results: ACCEPTABLE/All criteria met

For the grain size analyses, there were often slight discrepancies between the hardcopy and the EDD. Results are reported as percent passing on the hardcopy and percent retained in the EDD, with all values rounded to one decimal place. Because the results in the EDD were calculated using unrounded values, no action was taken based on the 0.1% difference often noted.

SDGs IY32 and IY86: Several results were verified by recalculation from the raw data. No calculation or transcription errors were noted.

SDG IY36: The electronic data deliverables (EDD) for this SDG contains errors in the results for the grain size duplicate and triplicate analysis for Sample T117-B4-SB-04, with duplicate and triplicate values being switched. These errors were noted and no further action was taken.

IV. OVERALL ASSESSMENT OF THE DATA

As determined by this evaluation, the laboratory followed the specified analytical methods. The laboratory triplicate RSD values indicated acceptable precision. Accuracy was also acceptable, as demonstrated by the matrix spike, LCS, and SRM %R values.

All data, as reported, are acceptable for use.

EcoChem, Inc.

Environmental Science and Chemistry

APPENDIX A
DATA QUALIFIER DEFINITIONS

REASON CODES

DATA VALIDATION QUALIFIER CODES
National Functional Guidelines

The following definitions provide brief explanations of the qualifiers assigned to results in the data review process.

U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
N	The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification".
NJ	The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents the approximate concentration.
UJ	The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

The following is an EcoChem qualifier that may also be assigned during the data review process:

DNR	Do not report; a more appropriate result is reported from another analysis or dilution.

DATA QUALIFIER REASON CODES

1	Holding Time/Sample Preservation
2	Chromatographic pattern in sample does not match pattern of calibration standard.
3	Compound Confirmation
4	Tentatively Identified Compound (TIC) (associated with NJ only)
5A	Calibration (initial)
5B	Calibration (continuing)
6	Field Blank Contamination
7	Lab Blank Contamination (e.g., method blank, instrument, etc.)
8	Matrix Spike(MS & MSD) Recoveries
9	Precision (all replicates)
10	Laboratory Control Sample Recoveries
11	A more appropriate result is reported (associated with "R" and "DNR" only)
12	Reference Material
13	Surrogate Spike Recoveries (a.k.a., labeled compounds & recovery standards)
14	Other (define in validation report)
15	GFAA Post Digestion Spike Recoveries
16	ICP Serial Dilution % Difference
17	ICP Interference Check Standard Recovery
18	Trip Blank Contamination
19	Internal Standard Performance (e.g., area, retention time, recovery)
20	Linear Range Exceeded
21	Potential False Positives

EcoChem Validation Guidelines (Based on Organic NFG 1999)
Semivolatile Analysis by GC/MS

VALIDATION QC ELEMENT	ACCEPTANCE CRITERIA	ACTION	REASON CODE
Cooler Temperature	4°C ±2°	J(+)/UJ(-) if greater than 6 deg. C (**EcoChem PJ**)	1
Holding Time	Water: 7 days from collection Soil: 14 days from collection Analysis: 40 days from extraction	Water: J(+)/UJ(-) if ext. > 7 and < 21 days J(+)/R(-) if ext > 21 days (**EcoChem PJ**) Solids/Wastes: J(+)/UJ(-) if ext. > 14 and < 42 days J(+)/R(-) if ext. > 42 days (**EcoChem PJ**) J(+)/UJ(-) if analysis >40 days	1
Tuning	DFTPP Beginning of each 12 hour period Method acceptance criteria	R(+/-) all analytes in all samples associated with the tune	5A
Initial Calibration (Minimum 5 stds.)	RRF > 0.05	**(EcoChem PJ, see TM-06)** If MDL= reporting limit: J(+)/R(-) if RRF < 0.05 If reporting limit > MDL: note in worksheet if RRF <0.05	5A
	%RSD < 30%	**(EcoChem PJ, see TM-06)** J(+) if %RSD > 30%	5A
Continuing Calibration (Prior to each 12 hr. shift)	RRF > 0.05	**(EcoChem PJ, see TM-06)** If MDL= reporting limit: J(+)/R(-) if RRF < 0.05 If reporting limit > MDL: note in worksheet if RRF <0.05	5B
	%D <25%	**(EcoChem PJ, see TM-06)** If > +/-90%: J+/R- If -90% to -26%: J+ (high bias) If 26% to 90%: J+/UJ- (low bias)	5B
Method Blank	One per matrix per batch No results > CRQL	U(+) if sample (+) result is less than CRQL and less than appropriate 5X or 10X rule (raise sample value to CRQL)	7
		U(+) if sample (+) result is greater than or equal to CRQL and less than appropriate 5X and 10X rule (at reported sample value)	7
	No TICs present	R(+) TICs using 10X rule	7
Field Blanks (Not Required)	No results > CRQL	Apply 5X/10X rule; U(+) < action level	6

EcoChem Validation Guidelines (Based on Organic NFG 1999)
Semivolatile Analysis by GC/MS

VALIDATION QC ELEMENT	ACCEPTANCE CRITERIA	ACTION	REASON CODE
MS/MSD (recovery)	One per matrix per batch Use method acceptance criteria	Qualify parent only unless other QC indicates systematic problems: J(+) if both %R > UCL J(+)/UJ(-) if both %R < LCL J(+)/R(-) if both %R < 10% **PJ if only one %R outlier**	8
MS/MSD (RPD)	One per matrix per batch Use method acceptance criteria	J(+) if RPD > CL	9
LCS **low conc. H2O SVOA**	One per lab batch Within method control limits	J(+) assoc. cmpd if > UCL J(+)/R(-) assoc. cmpd if < LCL J(+)/R(-) all cmpds if half are < LCL	10
LCS **regular SVOA (H2O & solid)**	One per lab batch Lab or method control limits	J(+) if %R > UCL J(+)/UJ(-) if %R <LCL J(+)/R(-) if %R < 10% **(EcoChem PJ)**	10
LCS/LCSD *(if required)*	One set per matrix and batch of 20 samples RPD < 35%	J(+)/UJ(-) assoc. cmpd. in all samples	9
Surrogates	Minimum of 3 acid and 3 base/neutral compounds Use method acceptance criteria	Do not qualify if only 1 acid and/or 1 B/N surrogate is out unless <10% J(+) if %R > UCL J(+)/UJ(-) if %R < LCL J(+)/R(-) if %R < 10%	13
Internal Standards	Added to all samples Acceptable Range: IS area 50% to 200% of CCAL area RT within 30 seconds of CC RT	J(+) if > 200% J(+)/UJ(-) if < 50% J(+)/R(-) if < 25% R T>30 seconds, **narrate and Notify PM**	19
Field Duplicates	Use QAPP limits If no QAPP: Use RPD < 35% (water) or < 50% (soil)	Narrate and qualify if required by project **(EcoChem PJ)**	9
TICs	Major ions (>10%) in reference must be present in sample; intensities agree within 20%; check identification	R(+) common laboratory contaminants R(+) target compouds from other fractions **See Technical Director for ID issues**	4
Quantitation/ Identification	RRT within 0.06 of standard RRT Ion relative intensity within 20% of standard All ions in std. at > 10% intensity must be present in sample	**See Technical Director if outliers**	14 21 (false +)

EcoChem Validation Guidelines (Based on Organic NFG 1999)
Pesticides/PCBs by GC/ECD

VALIDATION QC ELEMENT	ACCEPTANCE CRITERIA	ACTION	REASON CODE
Cooler Temperature	4°C ±2°	J(+)/UJ(-) if greater than 6 deg. C (EcoChem PJ)	1
Holding Time	Water: 7 days from collection Soil: 14 days from collection Analysis: 40 days from extraction	J(+)/UJ(-) if ext/analyzed > HT J(+)/R(-) if ext/analyzed > 3X HT (EcoChem PJ)	1
Resolution Check	Beginning of ICAL Sequence Within RTW Resolution >90%	Narrate (Use Professional Judgement to qualify)	14
Instrument Performance (Breakdown)	DDT Breakdown: < 20% Endrin Breakdown: <20% Combined Breakdown: <30% Compounds within RTW	J(+) DDT NJ(+) DDD and/or DDE R(-) DDT - If (+) for either DDE or DDD J(+) Endrin NJ(+) EK and/or EA R(-) Endrin - If (+) for either EK or EA	5A
Retention Times	Surrogates: TCX (+/- 0.05); DCB (+/- 0.10) Target compounds: elute before heptachlor epoxide (+/- 0.05) elute after heptachlor epoxide (+/- 0.07)	NJ(+)/R(-) results for analytes with RT shifts **For full DV, use PJ based on examination of raw data**	5B
Initial Calibration	Pesticides: Low=CRQL, Mid=4X, High=16X Multiresponse - one point Calibration %RSD<20% %RSD<30% for surr; two comp. may exceed if <30% Resolution in Mix A and Mix B >90%	J(+)/UJ(-)	5A
Continuing Calibration	Alternating PEM standard and INDA/INDB standards every 12 hours (each preceeded by an inst. Blank) %D < 25% Resolution >90% in IND mixes; 100% for PEM	J(+)/UJ(-) J(+)R(-) if %D > 90% **PJ for resolution**	5B
Method Blank	One per matrix per batch No results > CRQL	U(+) if sample result is < CRQL and < 5X rule (raise sample value to CRQL)	7
		U(+) if sample result is > or equal to CRQL and < 5X rule (at reported sample value)	7
Instrument Blanks	Analyzed at the beginning of every 12 hour sequence No analyte > 1/2 CRQL	Same as Method Blank	7
Field Blanks	Not addressed by NFG No results > CRQL	Apply 5X rule; U(+) < action level	6

EcoChem Validation Guidelines (Based on Organic NFG 1999)
Pesticides/PCBs by GC/ECD

VALIDATION QC ELEMENT	ACCEPTANCE CRITERIA	ACTION	REASON CODE
MS/MSD (recovery)	One set per matrix per batch Method Acceptance Criteria	Qualify parent only unless other QC indicates systematic problems: J(+) if both %R > UCL J(+)/UJ(-) if both %R < LCL J(+)/R(-) if both %R < 10% **PJ if only one %R outlier**	8
MS/MSD (RPD)	One set per matrix per batch Method Acceptance Criteria	J(+) if RPD > CL	9
LCS	One per SDG Method Acceptance Criteria	J(+) if %R > UCL J(+)/UJ(-) if %R < LCL J(+)/R(-) using PJ if %R <<LCL (< 10%)	10
LCS/LCSD *(if required)*	One set per matrix and batch of 20 samples RPD < 35%	J(+)/UJ(-) assoc. cmpd. in all samples	9
Surrogates	TCX and DCB added to every sample %R = 30-150%	J(+)/UJ(-) if both %R = 10 - 60% J(+) if both >150% J(+)/R(-) if any %R <10%	13
Quantitation/ Identification	Quantitated using ICAL calibration factor (CF) RPD between columns <40%	J(+) if RPD = 40 - 60% NJ(+) if RPD >60% **EcoChem PJ - See TM-08**	3
Two analyses for one sample	Report only one result per analyte	"DNR" results that should not be used to avoid reporting two results for one sample	11
Sample Clean-up	GPC required for soil samples Florisil required for all samples Sulfur is optional Clean-up standard check %R within CLP limits	J(+)/UJ(-) if %R < LCL J(+) if %R > UCL	14
Field Duplicates	Water: RPD < 35% Soil: RPD < 50%	Narrate **(Qualifiy if required by project QAPP)**	9

State of Washington (and Oregon)
Total Petroleum Hydrocarbons-Gasoline Range

VALIDATION QC ELEMENT	ACCEPTANCE CRITERIA	ACTION	REASON CODE
Cooler Temperature	4°C±2°C Water: HCl to pH < 2	J(+)/UJ(-) if greater than 6 deg. C	2
Hold Time	Waters: 14 days preserved 7 days unpreserved Solids: 14 Days	J(+)/UJ(-) if hold times exceeded J(+)/R(-) if exceeded > 3X using PJ	1
Initial Calibration	5 calibration points (All within 15% of true value) Linear Regression: $R^2 \geq 0.990$	J(+)/UJ(-) If %RSD > 25% (Narrate if less than 5 calibration points)	5A
Continuing Calibration	Continuing Calibration Verification (CCV) (2nd Source) analyzed every 20 samples Recovery range 80% to 120%	CVS - Professional judgement CCS - J(+)/UJ(-) If %D > 25%	5B
Method Blank	Two per matrix per batch No results >CRQL	U(+) if sample (+) result is less than CRQL and less than appropriate 5X rule (raise sample value to CRQL)	7
		UJ(+) if sample (+) result is greater than or equal to CRQL and less than appropriate 5X rule (at reported sample value)	7
Trip Blank	Not addressed in method	Same as method blank for positive results remaining in trip blank after method blank qualifiers are assigned	18
Field Blanks (Not Required)	No results > CRQL	Apply 5X rule; U(+) < action level	6
MS (Optional)	Lab control limits	Qualify parent only, unless other QC indicates systematic problems. J(+) if both %R > UCL J(+)/UJ(-) if both %R < LCL PJ if only one %R outlier	8
Precision: MS/MSD or LCS/LCSD or sample/dup	Two per analytical batch RPD $\leq$ lab control limits	J(+) if RPD >lab control limits	9
LCS (Optional)	Lab control limits	J(+) If %R >UCL J(+)/R(-) If %R <LCL	10
Surrogates	bromofluorobenzene and/or 1,4-difluorobenzene added to every sample %R = 50-150%	J(+)/UJ(-) If %R < LCL J(+) If > UCL J(+)/R(-) If any %R <10%	13
Field Duplicates	Use RPD < 35% (water) or < 50% (soil)	Narrate (Use Professional Judgement to qualify)	9
Two analyses for one sample (dilution)	Report only one result per analyte	"DNR" results that should not be used to avoid reporting two results for one sample	14

State of Washington (and Oregon)
Total Petroleum Hydrocarbons-Diesel (and Residual) Range

VALIDATION QC ELEMENT	ACCEPTANCE CRITERIA	ACTION	REASON CODE
Cooler Temperature	4°C±2°C	J(+)/UJ(-) using Professional Judgement	2
Holding Time	Water: 14 days from collection (if acidified); 7 days (if unacidified) Soil: 14 days from collection Analysis: 40 days from extraction	J(+)/UJ(-) if ext/analyzed > HT J(+)/R(-) if ext/analyzed > 3X HT (Prof. Judgement)	1
Retention Time Standards (RTS)	RTS run every 24 hours or at the beginning of each analytical shift (C10 and C24)	Narrate (Use Professional Judgement to qualify)	5B
Initial Calibration	5 calibration points (All within 15%) Linear Regression: $R^2 \geq 0.990$	J(+)/UJ(-) If $R^2 < 0.990$	5A
Continuing Calibration	Recovery Range is 85% to 115% Must have opening and closing CCVs (no more than 20 samples)	CCV - J(+)/UJ(-) If %D > 15%	5B
Method Blank	One per matrix per batch No results ≥CRQL	U(+) if sample result is < CRQL and < 5X rule (raise sample value to CRQL) UJ(+) if sample result is ≥CRQL and < 5X rule (at reported sample value)	7
Field Blanks	No results ≥ CRQL	Apply 5X rule; U(+) < action level	6
MS (Optional)	Lab control limits	Qualify parent only, unless other QC indicates systematic problems. J(+) if both %R > UCL J(+)/UJ(-) if both %R < LCL PJ if only one %R outlier	8
Precision: MS/MSD or LCS/LCSD or sample/dup	Two lab dups per analytical batch RPD ≤ laboratory limits	J(+) if RPD >laboratory limits	9
LCS (Optional)	Lab control limits	J(+) If %R >UCL J(+)/R(-) If %R <LCL	10
Surrogates	Suggested Surrogates: 2-fluorobiphenyl, o, or p-terphenyl or pentacosane %R = 50-150%	If %R < LCL, J(+)/UJ(-) If > UCL, J(+) If any %R <10%, J(+)/R(-)	13
Two analyses for one sample (dilution)	Report only one result per analyte	"DNR" results that should not be used to avoid reporting two results for one sample	14
Field Duplicates	Use RPD < 35% (water) or < 50% (soil)	Narrate (Use Professional Judgement to qualify)	9

EcoChem Validation Guidelines (Based on Inorganic NFG 1994 & 2002)
Metals by ICP

VALIDATION QC ELEMENT	ACCEPTANCE CRITERIA	ACTION	REASON CODE
Cooler Temperature and Preservation	4°C ±2° Water Only: Nitric Acid to pH < 2 For Dissolved metals, 0.45 um filter preserve after filtration	Professional Judgment J(+)/UJ(-) if preservation requirements are not met	1
Holding Time	180 days	Professional Judgment J(+)/UJ(-)	1
Initial Calibration	Blank + minimum 1 standard once every 24 hours if more than 1 standard r>0.995	Professional Judgment J(+)/UJ(-) if r<0.995 (multi point cal)	5A
Initial Calibration Verification (ICV)	Independent source analyzed immed. after cal. %R within +/- 10% of true value	Professional Judgment J(+)/UJ(-) if %R 75%-89% J(+) if %R = 111-125% R(+) if %R > 125% R(+/-) if %R < 75%	5A
Continuing Cal Verification (CCV)	Every ten samples, immed. Before samples+ and end of run %R within +/- 10% of true value	Professional Judgment J(+)/UJ(-) if %R = 75%-89% J(+) if %R 111-125% R(+) if %R > 125% R(+/-) if %R < 75%	5B
CRI Standard (to check CRDL)	2X CRDL (or 2X IDL if greater) analyzed beginning and end of run (at least 8 hrs) Not required for Al, Ba, Ca, Fe, Mg, Na, K %R = 70%-130% (50%-150% Sb, Pb, Tl)	Professional Judgment R(-),(+)<2XCRDL if %R <50% (< 30% Sb, Pb, Tl) J(+)<2XCRDL, UJ(-) if %R 50-69% (30%-49% Sb, Pb,Tl) J(+) <2X CRDL if %R 130%-180% (150%-200%Sb, Pb, Tl) R(+)<2X CRDL if %R>180%(200% Sb, Pb, Tl)	14

Initial and Continuing Cal Blanks (ICB/CCB)	after each ICV and CCV
	every ten samples and end of run
	blank < +/- IDL
		Action level is 5x abs. value of blk conc.
		For (+) blk value, U(+) values < action level
		For (-) blk value, J(+)/UJ(-) values < action level
			7

Prep Blank	One per matrix per batch
	(not to exceed 20 samples)
		Action level is 5x abs. value of blk conc.
		For (+) blk value, U(+) values < action level
		For (-) blk value, J(+)/UJ(-) values < action level
			7

Interference Check Samples ICSA/ICSAB	Beginning and end of each run or every eight hours ICSAB +/- 20% ICSA < +/- IDL	For samp with Al,Ca,Fe,Mg > ICS levels R(+/-) if %R<50% J(+) if %R >120% J(+)/UJ(-) if %R= 50% to 79% Professional Judgment ICSA	17
Post Digestion Spike	If ICP Matrix Spike is outside 75-125%, spike at twice the sample conc.	No Quals assigned based on this element	

EcoChem Validation Guidelines (Based on Inorganic NFG 1994 & 2002)
Metals by ICP

VALIDATION QC ELEMENT	ACCEPTANCE CRITERIA	ACTION	REASON CODE
Matrix Spike	One per matrix per batch 75-125% for samples less than 4 x spike level	J(+) if %R>125% J(+)/UJ(-) if %R <75% J(+)/R(-) if %R<30%	8
Laboratory Duplicate	One per matrix per batch RPD <20% for samples > 5x CRDL Diff <CRDL for samples >CRDL and <5 x CRDL (may use RPD < 35%, Diff < 2X CRDL for solids)	J(+)/UJ(-) if RPD > 20% or diff > CRDL	9
Serial Dilution	5x dilution one per matrix %D <10% for values > 50x IDL	J(+)/UJ(-) if %D >10%	16
Laboratory Control Sample	Waters: One per matrix per batch %R (80-120%)	R(+/-) if %R < 50% J(+)/UJ(-) if %R = 50-79% J(+) if %R >120%	10
	Soils: One per matrix per batch Result within manufacturer's certified acceptance range	J(+)/UJ(-) if < LCL, J(+) if > UCL	10
Field Blanks	taken on same day as samples	Action level is 5x blk conc. U(+) sample values < AL	6
Field Duplicates	Waters RPD < 35% Soils RPD < 50% for values > 5 x CRDL Diff<CRDL for samples >CRDL and <5 x CRDL (may use Diff < 2X CRDL for solids)	J(+)/UJ(-) in parent samples only	9
Instrument Detection Limit	determined every 3 months	Professional Judgment	14
Linear Range	determined yearly samples diluted to fall within range	J(+) values over range	20

EcoChem Validation Guidelines (Based on Methods)
Conventionals Analyses

VALIDATION QC ELEMENT	ACCEPTANCE CRITERIA	ACTION	REASON CODE
Cooler Temperature and Preservation	4°C ±2° Water: NaOH to pH > 12 (for CN)	J(+)/UJ(-) if preservation requirements not met EcoChem PJ	1
Holding Time	Method Specific	Professional Judgment J(+)/UJ(-) if holding time exceeded J(+)/R(-) if HT exceeded by > 3X	1
Initial Calibration	Method specific once every 24 hours One at CRDL r>0.995	Professional judgment J(+)/UJ(-) for r < 0.995	5A
Initial Calibration Verification (ICV)	Independent source analyzed immediately after cal. %R method specific	R(+/-) if %R sig < LCL J(+)/UJ(-) if %R < LCL J(+) if %R > UCL R(+) if %R sig > UCL	5A
Continuing Cal Verification (CCV)	Every ten samples, immed. following ICV/ICB and end of run %R method specific	R(+/-) if %R sig < LCL J(+)/UJ(-) if %R < LCL J(+) if %R > UCL R(+) if %R sig > UCL	5B
Initial and Continuing Cal Blanks (ICB/CCB)	After each ICV and CCV every ten samples and end of run blank < +/- IDL	For positive blk results: UJ(+) < 5X blk contamination For negative blk results: J(+)/UJ(-) < abs. value of 5X blk contamination	7
Prep Blank	One per matrix per batch (not to exceed 20 samples)	For positive blk results: UJ(+) < 5X blk contamination For negative blk results: J(+)/UJ(-) < abs. value of 5X blk contamination	7
Matrix Spike	One per matrix per batch; 5% frequency 75-125% for samples less than 4 x spike level	J(+) if %R > 125% or < 75% UJ(-) if %R = 30-74% R(+/-) results < IDL if %R < 30%	8
Laboratory Duplicate	One per matrix per batch RPD <20% for samples > 5x CRDL Diff < CRDL for samples >CRDL and <5 x CRDL (may use RPD < 35%, Diff < 2X CRDL for solids)	J(+)/UJ(-) in assoc samples if RPD > 20% or diff > CRDL	9
Laboratory Control Sample	Waters: One per matrix per batch %R (80-120%)	R(+/-) if MS/MSD & LCS %R outside limits J(+)/UJ(-) if %R = 50-79% J(+) if %R > 120% R(+/-) if %R < 50%	10
	Soils: One per matrix per batch Result within manufacturer's certified acceptance range	J(+)/UJ(-) if < LCL, J(+) if > UCL	10

EcoChem Validation Guidelines (Based on Methods)
Conventionals Analyses

VALIDATION QC ELEMENT	ACCEPTANCE CRITERIA	ACTION	REASON CODE
Field Blanks	taken on same day as samples	Action level is 5x blk conc. U(+) sample values < AL	6
Field Duplicates	Waters RPD < 35% Soils RPD < 50% for values > 5 x CRDL Diff < CRDL for samples >CRDL and <5 x CRDL (may use Diff < 2X CRDL for solids)	J(+)/UJ(-) in parent samples only	9

APPENDIX B
QUALIFIED DATA SUMMARY TABLE

Qualified Data Summary Table
Port of Seattle
Terminal 117 Upland Investigation

SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Unit	Laboratory Qualifier	Validation Qualifier	Reason Code
IY32	T117-A9-SB-01	06-491-IY32A	SW8270D	Benzo(g,h,i)perylene	38	ug/kg	J	J	5B
IY32	T117-A9-SB-02	06-492-IY32B	SW8270D	Benzo(g,h,i)perylene	64	ug/kg	U	UJ	5B
IY32	T117-A9-SB-03	06-493-IY32C	SW8270D	Benzo(g,h,i)perylene	66	ug/kg	U	UJ	5B
IY32	T117-A7-SB-01	06-494-IY32D	SW8270D	Benzo(g,h,i)perylene	64	ug/kg	U	UJ	5B
IY32	T117-A7-SB-02	06-495-IY32E	SW8270D	Benzo(g,h,i)perylene	66	ug/kg	U	UJ	5B
IY32	T117-A7-SB-03	06-496-IY32F	SW8270D	Benzo(g,h,i)perylene	64	ug/kg	U	UJ	5B
IY32	T117-A7-SB-201	06-497-IY32G	SW8270D	Benzo(g,h,i)perylene	66	ug/kg	U	UJ	5B
IY32	T117-A5-SB-02	06-508-IY32R	SW8082	Aroclor 1254	1200	ug/kg	E	R	20
IY32	T117-A5-SB-02	06-508-IY32R	SW8082	Aroclor 1260	1100	ug/kg	E	R	20
IY32	T117-A5-SB-02	06-508-IY32RDL	SW8082	Aroclor 1016	330	ug/kg	U	R	11
IY32	T117-A5-SB-02	06-508-IY32RDL	SW8082	Aroclor 1221	330	ug/kg	U	R	11
IY32	T117-A5-SB-02	06-508-IY32RDL	SW8082	Aroclor 1232	330	ug/kg	U	R	11
IY32	T117-A5-SB-02	06-508-IY32RDL	SW8082	Aroclor 1242	330	ug/kg	U	R	11
IY32	T117-A5-SB-02	06-508-IY32RDL	SW8082	Aroclor 1248	330	ug/kg	U	R	11
IY33	T117-A3-SB-01	06-513-IY33C	SW8082	Aroclor 1260	7700	ug/kg	E	R	20
IY33	T117-A3-SB-01	06-513-IY33CDL	SW8082	Aroclor 1016	2100	ug/kg	U	R	11
IY33	T117-A3-SB-01	06-513-IY33CDL	SW8082	Aroclor 1221	2100	ug/kg	U	R	11
IY33	T117-A3-SB-01	06-513-IY33CDL	SW8082	Aroclor 1232	2100	ug/kg	U	R	11
IY33	T117-A3-SB-01	06-513-IY33CDL	SW8082	Aroclor 1242	2100	ug/kg	U	R	11
IY33	T117-A3-SB-01	06-513-IY33CDL	SW8082	Aroclor 1248	2100	ug/kg	U	R	11
IY33	T117-A3-SB-01	06-513-IY33CDL	SW8082	Aroclor 1254	2100	ug/kg	U	R	11
IY33	T117-A4-SB-01	06-516-IY33F	NWTPH-Dx	Motor Oil	870	mg/kg		J	5B
IY33	T117-A4-SB-02	06-517-IY33G	NWTPH-Dx	Motor Oil	98	mg/kg		J	5B
IY33	T117-A4-SB-03	06-518-IY33H	NWTPH-Dx	Motor Oil	930	mg/kg		J	5B
IY33	T117-A4-SB-202	06-519-IY33I	NWTPH-Dx	Motor Oil	790	mg/kg		J	5B
IY35	T117-B2-SB-04	06-557-IY35H	SW8082	Aroclor 1260	330	ug/kg	E	R	20
IY35	T117-B2-SB-04	06-557-IY35HDL	SW8082	Aroclor 1016	100	ug/kg	U	R	11
IY35	T117-B2-SB-04	06-557-IY35HDL	SW8082	Aroclor 1221	100	ug/kg	U	R	11
IY35	T117-B2-SB-04	06-557-IY35HDL	SW8082	Aroclor 1232	100	ug/kg	U	R	11
IY35	T117-B2-SB-04	06-557-IY35HDL	SW8082	Aroclor 1242	100	ug/kg	U	R	11
IY35	T117-B2-SB-04	06-557-IY35HDL	SW8082	Aroclor 1248	100	ug/kg	U	R	11
IY35	T117-B2-SB-04	06-557-IY35HDL	SW8082	Aroclor 1254	100	ug/kg	U	R	11
IY35	T117-B3-SB-01	06-563-IY35N	SW8082	Aroclor 1260	8300	ug/kg	E	R	20
IY35	T117-B3-SB-01	06-563-IY35NDL	SW8082	Aroclor 1016	2200	ug/kg	U	R	11
IY35	T117-B3-SB-01	06-563-IY35NDL	SW8082	Aroclor 1221	2200	ug/kg	U	R	11
IY35	T117-B3-SB-01	06-563-IY35NDL	SW8082	Aroclor 1232	2200	ug/kg	U	R	11
IY35	T117-B3-SB-01	06-563-IY35NDL	SW8082	Aroclor 1242	2200	ug/kg	U	R	11
IY35	T117-B3-SB-01	06-563-IY35NDL	SW8082	Aroclor 1248	2200	ug/kg	U	R	11
IY35	T117-B3-SB-01	06-563-IY35NDL	SW8082	Aroclor 1254	2200	ug/kg	U	R	11
IY35	T117-B3-SB-02	06-564-IY35O	SW8270D	Benzo(g,h,i)perylene	64	ug/kg	U	UJ	19
IY35	T117-B3-SB-02	06-564-IY35O	SW8270D	Dibenz(a,h)anthracene	64	ug/kg	U	UJ	19
IY35	T117-B3-SB-02	06-564-IY35O	SW8270D	Indeno(1,2,3-cd)pyrene	64	ug/kg	U	UJ	19
IY35	T117-B3-SB-02	06-564-IY35ODL	SW8270D	1-Methylnaphthalene	190	ug/kg	U	R	11
IY35	T117-B3-SB-02	06-564-IY35ODL	SW8270D	2-Methylnaphthalene	190	ug/kg	U	R	11
IY35	T117-B3-SB-02	06-564-IY35ODL	SW8270D	Acenaphthene	190	ug/kg	U	R	11
IY35	T117-B3-SB-02	06-564-IY35ODL	SW8270D	Acenaphthylene	190	ug/kg	U	R	11
IY35	T117-B3-SB-02	06-564-IY35ODL	SW8270D	Anthracene	190	ug/kg	U	R	11
IY35	T117-B3-SB-02	06-564-IY35ODL	SW8270D	Benzo(a)anthracene	190	ug/kg	U	R	11
IY35	T117-B3-SB-02	06-564-IY35ODL	SW8270D	Benzo(a)pyrene	190	ug/kg	U	R	11

Qualified Data Summary Table
Port of Seattle
Terminal 117 Upland Investigation

SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Unit	Laboratory Qualifier	Validation Qualifier	Reason Code
IY35	T117-B3-SB-02	06-564-IY35ODL	SW8270D	Benzo(b)fluoranthene	190	ug/kg	U	R	11
IY35	T117-B3-SB-02	06-564-IY35ODL	SW8270D	Benzo(g,h,i)perylene	190	ug/kg	U	R	11
IY35	T117-B3-SB-02	06-564-IY35ODL	SW8270D	Benzo(k)fluoranthene	190	ug/kg	U	R	11
IY35	T117-B3-SB-02	06-564-IY35ODL	SW8270D	Chrysene	190	ug/kg	U	R	11
IY35	T117-B3-SB-02	06-564-IY35ODL	SW8270D	Dibenz(a,h)anthracene	190	ug/kg	U	R	11
IY35	T117-B3-SB-02	06-564-IY35ODL	SW8270D	Dibenzofuran	190	ug/kg	U	R	11
IY35	T117-B3-SB-02	06-564-IY35ODL	SW8270D	Fluoranthene	190	ug/kg	U	R	11
IY35	T117-B3-SB-02	06-564-IY35ODL	SW8270D	Fluorene	190	ug/kg	U	R	11
IY35	T117-B3-SB-02	06-564-IY35ODL	SW8270D	Indeno(1,2,3-cd)pyrene	190	ug/kg	U	R	11
IY35	T117-B3-SB-02	06-564-IY35ODL	SW8270D	Naphthalene	190	ug/kg	U	R	11
IY35	T117-B3-SB-02	06-564-IY35ODL	SW8270D	Phenanthrene	190	ug/kg	U	R	11
IY35	T117-B3-SB-02	06-564-IY35ODL	SW8270D	Pyrene	190	ug/kg	U	R	11
IY35	T117-B6-SB-01	06-566-IY35Q	NWTPH-Dx	Diesel Range Hydrocarbons	440	mg/kg		J	2
IY35	T117-B6-SB-01	06-566-IY35Q	NWTPH-Dx	Motor Oil	760	mg/kg		J	2
IY36	T117-B4-SB-01	06-570-IY36A	SW8082	Aroclor 1260	740000	ug/kg	E	R	20
IY36	T117-B4-SB-01	06-570-IY36ADL	SW8082	Aroclor 1016	90000	ug/kg	U	R	11
IY36	T117-B4-SB-01	06-570-IY36ADL	SW8082	Aroclor 1221	90000	ug/kg	U	R	11
IY36	T117-B4-SB-01	06-570-IY36ADL	SW8082	Aroclor 1232	90000	ug/kg	U	R	11
IY36	T117-B4-SB-01	06-570-IY36ADL	SW8082	Aroclor 1242	90000	ug/kg	U	R	11
IY36	T117-B4-SB-01	06-570-IY36ADL	SW8082	Aroclor 1248	90000	ug/kg	U	R	11
IY36	T117-B4-SB-01	06-570-IY36ADL	SW8082	Aroclor 1254	90000	ug/kg	U	R	11
IY36	T117-B4-SB-02	06-571-IY36B	SW8270D	Benzo(a)pyrene	19000	ug/kg	E	R	20
IY36	T117-B4-SB-02	06-571-IY36B	SW8270D	Benzo(b)fluoranthene	31000	ug/kg	E	R	20
IY36	T117-B4-SB-02	06-571-IY36B	SW8270D	Benzo(k)fluoranthene	11000	ug/kg	E	R	20
IY36	T117-B4-SB-02	06-571-IY36B	SW8270D	Chrysene	12000	ug/kg	E	R	20
IY36	T117-B4-SB-02	06-571-IY36BDL	SW8270D	1-Methylnaphthalene	640	ug/kg	U	R	11
IY36	T117-B4-SB-02	06-571-IY36BDL	SW8270D	2-Methylnaphthalene	640	ug/kg	U	R	11
IY36	T117-B4-SB-02	06-571-IY36BDL	SW8270D	Acenaphthene	640	ug/kg	U	R	11
IY36	T117-B4-SB-02	06-571-IY36BDL	SW8270D	Acenaphthylene	640	ug/kg	U	R	11
IY36	T117-B4-SB-02	06-571-IY36BDL	SW8270D	Anthracene	1000	ug/kg		R	11
IY36	T117-B4-SB-02	06-571-IY36BDL	SW8270D	Benzo(a)anthracene	8800	ug/kg		R	11
IY36	T117-B4-SB-02	06-571-IY36BDL	SW8270D	Benzo(g,h,i)perylene	4100	ug/kg		R	11
IY36	T117-B4-SB-02	06-571-IY36BDL	SW8270D	Dibenz(a,h)anthracene	1200	ug/kg		R	11
IY36	T117-B4-SB-02	06-571-IY36BDL	SW8270D	Dibenzofuran	640	ug/kg	U	R	11
IY36	T117-B4-SB-02	06-571-IY36BDL	SW8270D	Fluoranthene	9300	ug/kg		R	11
IY36	T117-B4-SB-02	06-571-IY36BDL	SW8270D	Fluorene	640	ug/kg	U	R	11
IY36	T117-B4-SB-02	06-571-IY36BDL	SW8270D	Indeno(1,2,3-cd)pyrene	4500	ug/kg		R	11
IY36	T117-B4-SB-02	06-571-IY36BDL	SW8270D	Naphthalene	640	ug/kg	U	R	11
IY36	T117-B4-SB-02	06-571-IY36BDL	SW8270D	Phenanthrene	1400	ug/kg		R	11
IY36	T117-B4-SB-02	06-571-IY36BDL	SW8270D	Pyrene	8300	ug/kg		R	11
IY36	T117-B4-SB-03	06-572-IY36C	SW8270D	Benzo(g,h,i)perylene	460	ug/kg		R	11
IY36	T117-B4-SB-03	06-572-IY36C	SW8270D	Dibenz(a,h)anthracene	110	ug/kg	J	J	19
IY36	T117-B4-SB-03	06-572-IY36C	SW8270D	Indeno(1,2,3-cd)pyrene	420	ug/kg		R	11
IY36	T117-B4-SB-03	06-572-IY36CDL	SW8270D	1-Methylnaphthalene	380	ug/kg	U	R	11
IY36	T117-B4-SB-03	06-572-IY36CDL	SW8270D	2-Methylnaphthalene	380	ug/kg	U	R	11
IY36	T117-B4-SB-03	06-572-IY36CDL	SW8270D	Acenaphthene	380	ug/kg	U	R	11
IY36	T117-B4-SB-03	06-572-IY36CDL	SW8270D	Acenaphthylene	380	ug/kg	U	R	11
IY36	T117-B4-SB-03	06-572-IY36CDL	SW8270D	Anthracene	380	ug/kg	U	R	11

Qualified Data Summary Table
Port of Seattle
Terminal 117 Upland Investigation

SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Unit	Laboratory Qualifier	Validation Qualifier	Reason Code
IY36	T117-B4-SB-03	06-572-IY36CDL	SW8270D	Benzo(a)anthracene	1100	ug/kg		R	11
IY36	T117-B4-SB-03	06-572-IY36CDL	SW8270D	Benzo(a)pyrene	1800	ug/kg		R	11
IY36	T117-B4-SB-03	06-572-IY36CDL	SW8270D	Benzo(b)fluoranthene	2200	ug/kg		R	11
IY36	T117-B4-SB-03	06-572-IY36CDL	SW8270D	Benzo(k)fluoranthene	1700	ug/kg		R	11
IY36	T117-B4-SB-03	06-572-IY36CDL	SW8270D	Chrysene	1300	ug/kg		R	11
IY36	T117-B4-SB-03	06-572-IY36CDL	SW8270D	Dibenz(a,h)anthracene	380	ug/kg	U	R	11
IY36	T117-B4-SB-03	06-572-IY36CDL	SW8270D	Dibenzofuran	380	ug/kg	U	R	11
IY36	T117-B4-SB-03	06-572-IY36CDL	SW8270D	Fluoranthene	1400	ug/kg		R	11
IY36	T117-B4-SB-03	06-572-IY36CDL	SW8270D	Fluorene	380	ug/kg	U	R	11
IY36	T117-B4-SB-03	06-572-IY36CDL	SW8270D	Naphthalene	380	ug/kg	U	R	11
IY36	T117-B4-SB-03	06-572-IY36CDL	SW8270D	Phenanthrene	210	ug/kg	J	R	11
IY36	T117-B4-SB-03	06-572-IY36CDL	SW8270D	Pyrene	1100	ug/kg		R	11
IY64	T117-B7-SB-0.5-2.0	06-614-IY64A	NWTPH-Dx	Diesel Range Hydrocarbons	110	mg/kg		J	2
IY64	T117-B7-SB-0.5-2.0	06-614-IY64A	NWTPH-Dx	Motor Oil	310	mg/kg		J	2
IY64	T117-B7-SB-2.0-3.5	06-615-IY64B	NWTPH-Dx	Diesel Range Hydrocarbons	110	mg/kg		J	2
IY64	T117-B7-SB-2.0-3.5	06-615-IY64B	NWTPH-Dx	Motor Oil	190	mg/kg		J	2,5B
IY64	T117-B7-SB-3.5-5.0	06-616-IY64C	NWTPH-Dx	Diesel Range Hydrocarbons	110	mg/kg		J	2
IY64	T117-B7-SB-3.5-5.0	06-616-IY64C	NWTPH-Dx	Motor Oil	150	mg/kg		J	2,5B
IY64	T117-B7-SB-11.0-12.5	06-621-IY64H	SW8082	Aroclor 1260	790	ug/kg	E	R	20
IY64	T117-B7-SB-11.0-12.5	06-621-IY64HDL	SW8082	Aroclor 1016	160	ug/kg	U	R	11
IY64	T117-B7-SB-11.0-12.5	06-621-IY64HDL	SW8082	Aroclor 1221	160	ug/kg	U	R	11
IY64	T117-B7-SB-11.0-12.5	06-621-IY64HDL	SW8082	Aroclor 1232	160	ug/kg	U	R	11
IY64	T117-B7-SB-11.0-12.5	06-621-IY64HDL	SW8082	Aroclor 1242	160	ug/kg	U	R	11
IY64	T117-B7-SB-11.0-12.5	06-621-IY64HDL	SW8082	Aroclor 1248	160	ug/kg	U	R	11
IY64	T117-B7-SB-11.0-12.5	06-621-IY64HDL	SW8082	Aroclor 1254	240	ug/kg	Y	R	11
IY72	T117-D3-SB-6.0-7.5	06-699-IY72A	SW6010B	Chromium	11.2	mg/kg		J	9
IY72	T117-D3-SB-7.5-9.0	06-700-IY72B	SW6010B	Chromium	21.5	mg/kg		J	9
IY72	T117-D3-SB-9.0-10.5	06-701-IY72C	SW6010B	Chromium	20.1	mg/kg		J	9
IY72	T117-D3-SB-10.5-12.0	06-702-IY72D	SW6010B	Chromium	18.7	mg/kg		J	9
IY72	T117-D3-SB-12.0-13.5	06-703-IY72E	SW6010B	Chromium	18.1	mg/kg		J	9
IY72	T117-D6-SB-0.5-2.0	06-704-IY72F	SW6010B	Chromium	24.2	mg/kg		J	9
IY72	T117-D6-SB-0.5-2.0LR	06-704-IY72FDP	SW6010B	Chromium	17.7	mg/kg		J	9
IY72	T117-D6-SB-2.0-3.5	06-705-IY72G	SW8270D	Acenaphthene	6500	ug/kg	E	R	20
IY72	T117-D6-SB-2.0-3.5	06-705-IY72G	SW8270D	Anthracene	12000	ug/kg	E	R	20
IY72	T117-D6-SB-2.0-3.5	06-705-IY72G	SW8270D	Benzo(a)anthracene	21000	ug/kg	E	R	20
IY72	T117-D6-SB-2.0-3.5	06-705-IY72G	SW8270D	Benzo(a)pyrene	22000	ug/kg	E	R	20

Qualified Data Summary Table
Port of Seattle
Terminal 117 Upland Investigation

SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Unit	Laboratory Qualifier	Validation Qualifier	Reason Code
IY72	T117-D6-SB-2.0-3.5	06-705-IY72G	SW8270D	Benzo(b)fluoranthene	27000	ug/kg	E	R	20
IY72	T117-D6-SB-2.0-3.5	06-705-IY72G	SW8270D	Benzo(k)fluoranthene	13000	ug/kg	E	R	20
IY72	T117-D6-SB-2.0-3.5	06-705-IY72G	SW6010B	Chromium	26	mg/kg		J	9
IY72	T117-D6-SB-2.0-3.5	06-705-IY72G	SW8270D	Chrysene	22000	ug/kg	E	R	20
IY72	T117-D6-SB-2.0-3.5	06-705-IY72G	SW8270D	Fluoranthene	65000	ug/kg	E	R	20
IY72	T117-D6-SB-2.0-3.5	06-705-IY72G	SW8270D	Fluorene	5500	ug/kg	E	R	20
IY72	T117-D6-SB-2.0-3.5	06-705-IY72G	SW8270D	Phenanthrene	44000	ug/kg	E	R	20
IY72	T117-D6-SB-2.0-3.5	06-705-IY72G	SW8270D	Pyrene	36000	ug/kg	E	R	20
IY72	T117-D6-SB-2.0-3.5	06-705-IY72GDL	SW8270D	1-Methylnaphthalene	2000	ug/kg	U	R	11
IY72	T117-D6-SB-2.0-3.5	06-705-IY72GDL	SW8270D	2-Methylnaphthalene	2000	ug/kg	U	R	11
IY72	T117-D6-SB-2.0-3.5	06-705-IY72GDL	SW8270D	Acenaphthylene	2000	ug/kg	U	R	11
IY72	T117-D6-SB-2.0-3.5	06-705-IY72GDL	SW8270D	Benzo(g,h,i)perylene	8900	ug/kg		R	11
IY72	T117-D6-SB-2.0-3.5	06-705-IY72GDL	SW8270D	Dibenz(a,h)anthracene	2000	ug/kg	U	R	11
IY72	T117-D6-SB-2.0-3.5	06-705-IY72GDL	SW8270D	Dibenzofuran	2000	ug/kg	U	R	11
IY72	T117-D6-SB-2.0-3.5	06-705-IY72GDL	SW8270D	Indeno(1,2,3-cd)pyrene	8100	ug/kg		R	11
IY72	T117-D6-SB-2.0-3.5	06-705-IY72GDL	SW8270D	Naphthalene	2000	ug/kg	U	R	11
IY72	T117-D6-SB-3.5-5.0	06-706-IY72H	SW6010B	Chromium	13.4	mg/kg		J	9
IY72	T117-D6-SB-5.0-6.5	06-707-IY72I	SW8082	Aroclor 1260	5800	ug/kg	E	R	20
IY72	T117-D6-SB-5.0-6.5	06-707-IY72I	SW6010B	Chromium	39.8	mg/kg		J	9
IY72	T117-D6-SB-5.0-6.5	06-707-IY72IDL	SW8082	Aroclor 1016	1400	ug/kg	U	R	11
IY72	T117-D6-SB-5.0-6.5	06-707-IY72IDL	SW8082	Aroclor 1221	1400	ug/kg	U	R	11
IY72	T117-D6-SB-5.0-6.5	06-707-IY72IDL	SW8082	Aroclor 1232	1400	ug/kg	U	R	11
IY72	T117-D6-SB-5.0-6.5	06-707-IY72IDL	SW8082	Aroclor 1242	1400	ug/kg	U	R	11
IY72	T117-D6-SB-5.0-6.5	06-707-IY72IDL	SW8082	Aroclor 1248	1400	ug/kg	U	R	11
IY72	T117-D6-SB-5.0-6.5	06-707-IY72IDL	SW8082	Aroclor 1254	1400	ug/kg	U	R	11
IY72	T117-D6-SB-6.5-8.0	06-708-IY72J	SW6010B	Chromium	31	mg/kg		J	9
IY72	T117-D6-SB-8.0-9.5	06-709-IY72K	SW6010B	Chromium	14.6	mg/kg		J	9
IY72	T117-D6-SB-9.5-11.0	06-710-IY72L	SW6010B	Chromium	14.1	mg/kg		J	9
IY72	T117-D6-SB-11.0-12.5	06-711-IY72M	SW6010B	Chromium	17.3	mg/kg		J	9
IY72	T117-D6-SB-12.5-14.0	06-712-IY72N	SW6010B	Chromium	17.1	mg/kg		J	9
IY72	T117-D6-SB-209	06-713-IY72O	SW6010B	Chromium	17.3	mg/kg		J	9
IY78	T117-D11-SB-04	06-726-IY78D	SW8082	Aroclor 1260	1400	ug/kg	E	R	20
IY78	T117-D11-SB-04	06-726-IY78DDL	SW8082	Aroclor 1016	380	ug/kg	U	R	11
IY78	T117-D11-SB-04	06-726-IY78DDL	SW8082	Aroclor 1221	380	ug/kg	U	R	11
IY78	T117-D11-SB-04	06-726-IY78DDL	SW8082	Aroclor 1232	380	ug/kg	U	R	11
IY78	T117-D11-SB-04	06-726-IY78DDL	SW8082	Aroclor 1242	380	ug/kg	U	R	11
IY78	T117-D11-SB-04	06-726-IY78DDL	SW8082	Aroclor 1248	380	ug/kg	U	R	11
IY78	T117-D11-SB-04	06-726-IY78DDL	SW8082	Aroclor 1254	380	ug/kg	U	R	11
IY78	T117-E1-SB-12.5-14.0	06-741-IY78S	SW8082	Aroclor 1260	4400	ug/kg	E	R	20
IY78	T117-E1-SB-12.5-14.0	06-741-IY78SDL	SW8082	Aroclor 1016	820	ug/kg	U	R	11
IY78	T117-E1-SB-12.5-14.0	06-741-IY78SDL	SW8082	Aroclor 1221	820	ug/kg	U	R	11
IY78	T117-E1-SB-12.5-14.0	06-741-IY78SDL	SW8082	Aroclor 1232	820	ug/kg	U	R	11
IY78	T117-E1-SB-12.5-14.0	06-741-IY78SDL	SW8082	Aroclor 1242	820	ug/kg	U	R	11

Qualified Data Summary Table
Port of Seattle
Terminal 117 Upland Investigation

SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Unit	Laboratory Qualifier	Validation Qualifier	Reason Code
IY78	T117-E1-SB-12.5-14.0	06-741-IY78SDL	SW8082	Aroclor 1248	820	ug/kg	U	R	11
IY78	T117-E1-SB-12.5-14.0	06-741-IY78SDL	SW8082	Aroclor 1254	820	ug/kg	U	R	11
IY82	T117-E2-SB-01	06-754-IY82A	SW6010B	Arsenic	12	mg/kg		J	9
IY82	T117-E2-SB-01	06-754-IY82A	SW6010B	Lead	49	mg/kg		J	8
IY82	T117-E2-SB-01	06-754-IY82A	SW6010B	Zinc	72	mg/kg		J	9
IY82	T117-E2-SB-02	06-755-IY82B	SW6010B	Arsenic	5	mg/kg	U	UJ	9
IY82	T117-E2-SB-02	06-755-IY82B	SW6010B	Zinc	22.7	mg/kg		J	9
IY82	T117-E2-SB-03	06-756-IY82C	SW6010B	Arsenic	6	mg/kg	U	UJ	9
IY82	T117-E2-SB-03	06-756-IY82C	SW6010B	Zinc	19.8	mg/kg		J	9
IY82	T117-E2-SB-04-A	06-757-IY82D	SW6010B	Arsenic	6	mg/kg	U	UJ	9
IY82	T117-E2-SB-04-A	06-757-IY82D	SW6010B	Lead	4	mg/kg		J	8
IY82	T117-E2-SB-04-A	06-757-IY82D	SW6010B	Zinc	26.3	mg/kg		J	9
IY82	T117-E2-SB-04-B	06-758-IY82E	SW6010B	Arsenic	11	mg/kg		J	9
IY82	T117-E2-SB-04-B	06-758-IY82E	SW6010B	Lead	6	mg/kg		J	8
IY82	T117-E2-SB-04-B	06-758-IY82E	SW6010B	Zinc	40.7	mg/kg		J	9
IY82	T117-C8-SB-01	06-759-IY82F	SW6010B	Arsenic	16	mg/kg		J	9
IY82	T117-C8-SB-01	06-759-IY82F	SW6010B	Copper	36.7	mg/kg		J	9
IY82	T117-C8-SB-01	06-759-IY82F	SW6010B	Lead	147	mg/kg		J	8
IY82	T117-C8-SB-01	06-759-IY82F	SW6010B	Zinc	155	mg/kg		J	9
IY82	T117-C8-SB-01LR	06-759-IY82FDP	SW6010B	Arsenic	93	mg/kg		J	9
IY82	T117-C8-SB-01LR	06-759-IY82FDP	SW6010B	Copper	84.2	mg/kg		J	9
IY82	T117-C8-SB-01LR	06-759-IY82FDP	SW6010B	Lead	192	mg/kg		J	8
IY82	T117-C8-SB-01LR	06-759-IY82FDP	SW6010B	Zinc	374	mg/kg		J	9
IY82	T117-C8-SB-02	06-760-IY82G	SW6010B	Arsenic	10	mg/kg	U	UJ	9
IY82	T117-C8-SB-02	06-760-IY82G	SW6010B	Copper	99.1	mg/kg		J	9
IY82	T117-C8-SB-02	06-760-IY82G	SW6010B	Lead	65	mg/kg		J	8
IY82	T117-C8-SB-02	06-760-IY82G	NWTPH-Dx	Motor Oil	210	mg/kg		J	5B
IY82	T117-C8-SB-02	06-760-IY82G	SW6010B	Zinc	176	mg/kg		J	9
IY82	T117-C8-SB-03	06-761-IY82H	SW6010B	Arsenic	9	mg/kg		J	9
IY82	T117-C8-SB-03	06-761-IY82H	SW6010B	Copper	31.5	mg/kg		J	9
IY82	T117-C8-SB-03	06-761-IY82H	SW6010B	Lead	6	mg/kg		J	8
IY82	T117-C8-SB-03	06-761-IY82H	SW6010B	Zinc	46.8	mg/kg		J	9
IY82	T117-F3-SB-01	06-762-IY82I	SW6010B	Arsenic	8	mg/kg		J	9
IY82	T117-F3-SB-01	06-762-IY82I	SW6010B	Copper	24.4	mg/kg		J	9
IY82	T117-F3-SB-01	06-762-IY82I	SW6010B	Lead	21	mg/kg		J	8
IY82	T117-F3-SB-01	06-762-IY82I	SW6010B	Zinc	49.7	mg/kg		J	9
IY82	T117-F3-SB-02	06-763-IY82J	SW6010B	Arsenic	9	mg/kg		J	9
IY82	T117-F3-SB-02	06-763-IY82J	SW6010B	Copper	26	mg/kg		J	9
IY82	T117-F3-SB-02	06-763-IY82J	SW6010B	Lead	28	mg/kg		J	8
IY82	T117-F3-SB-02	06-763-IY82J	SW6010B	Zinc	65.7	mg/kg		J	9
IY82	T117-F3-SB-03	06-764-IY82K	SW6010B	Arsenic	16	mg/kg		J	9
IY82	T117-F3-SB-03	06-764-IY82K	SW6010B	Copper	45.9	mg/kg		J	9
IY82	T117-F3-SB-03	06-764-IY82K	SW6010B	Lead	112	mg/kg		J	8
IY82	T117-F3-SB-03	06-764-IY82K	SW6010B	Zinc	203	mg/kg		J	9
IY82	T117-F3-SB-04	06-765-IY82L	SW6010B	Arsenic	8	mg/kg		J	9
IY82	T117-F3-SB-04	06-765-IY82L	SW6010B	Copper	26.8	mg/kg		J	9
IY82	T117-F3-SB-04	06-765-IY82L	SW6010B	Lead	4	mg/kg		J	8
IY82	T117-F3-SB-04	06-765-IY82L	SW6010B	Zinc	34	mg/kg		J	9

Qualified Data Summary Table
Port of Seattle
Terminal 117 Upland Investigation

SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Unit	Laboratory Qualifier	Validation Qualifier	Reason Code
IY82	T117-C3-SB-01	06-767-IY82N	SW6010B	Arsenic	9	mg/kg		J	9
IY82	T117-C3-SB-01	06-767-IY82N	SW6010B	Copper	27.5	mg/kg		J	9
IY82	T117-C3-SB-01	06-767-IY82N	SW6010B	Lead	8	mg/kg		J	8
IY82	T117-C3-SB-01	06-767-IY82N	SW6010B	Zinc	42.6	mg/kg		J	9
IY82	T117-C3-SB-02	06-768-IY82O	SW8082	Aroclor 1260	370	ug/kg	E	R	20
IY82	T117-C3-SB-02	06-768-IY82O	SW6010B	Arsenic	7	mg/kg		J	9
IY82	T117-C3-SB-02	06-768-IY82O	SW6010B	Copper	25.5	mg/kg		J	9
IY82	T117-C3-SB-02	06-768-IY82O	SW6010B	Lead	5	mg/kg		J	8
IY82	T117-C3-SB-02	06-768-IY82O	SW6010B	Zinc	35	mg/kg		J	9
IY82	T117-C3-SB-02	06-768-IY82ODL	SW8082	Aroclor 1016	98	ug/kg	U	R	11
IY82	T117-C3-SB-02	06-768-IY82ODL	SW8082	Aroclor 1221	98	ug/kg	U	R	11
IY82	T117-C3-SB-02	06-768-IY82ODL	SW8082	Aroclor 1232	98	ug/kg	U	R	11
IY82	T117-C3-SB-02	06-768-IY82ODL	SW8082	Aroclor 1242	98	ug/kg	U	R	11
IY82	T117-C3-SB-02	06-768-IY82ODL	SW8082	Aroclor 1248	98	ug/kg	U	R	11
IY82	T117-C3-SB-02	06-768-IY82ODL	SW8082	Aroclor 1254	98	ug/kg	U	R	11
IY82	T117-C3-SB-03	06-769-IY82P	SW6010B	Arsenic	10	mg/kg		J	9
IY82	T117-C3-SB-03	06-769-IY82P	SW6010B	Copper	30.2	mg/kg		J	9
IY82	T117-C3-SB-03	06-769-IY82P	SW6010B	Lead	6	mg/kg		J	8
IY82	T117-C3-SB-03	06-769-IY82P	SW6010B	Zinc	47.6	mg/kg		J	9
IY86	T117-C1-SB-03	06-800-IY86C	SW8082	Aroclor 1260	2200	ug/kg	E	R	20
IY86	T117-C1-SB-03	06-800-IY86CDL	SW8082	Aroclor 1016	870	ug/kg	U	R	11
IY86	T117-C1-SB-03	06-800-IY86CDL	SW8082	Aroclor 1221	870	ug/kg	U	R	11
IY86	T117-C1-SB-03	06-800-IY86CDL	SW8082	Aroclor 1232	870	ug/kg	U	R	11
IY86	T117-C1-SB-03	06-800-IY86CDL	SW8082	Aroclor 1242	870	ug/kg	U	R	11
IY86	T117-C1-SB-03	06-800-IY86CDL	SW8082	Aroclor 1248	870	ug/kg	U	R	11
IY86	T117-C1-SB-03	06-800-IY86CDL	SW8082	Aroclor 1254	870	ug/kg	U	R	11
IY86	T117-C1-SB-05	06-802-IY86E	SW8082	Aroclor 1016	2300	ug/kg	U	R	11
IY86	T117-C1-SB-05	06-802-IY86E	SW8082	Aroclor 1221	2300	ug/kg	U	R	11
IY86	T117-C1-SB-05	06-802-IY86E	SW8082	Aroclor 1232	2300	ug/kg	U	R	11
IY86	T117-C1-SB-05	06-802-IY86E	SW8082	Aroclor 1242	2300	ug/kg	U	R	11
IY86	T117-C1-SB-05	06-802-IY86E	SW8082	Aroclor 1248	2300	ug/kg	U	R	11
IY86	T117-C1-SB-05	06-802-IY86E	SW8082	Aroclor 1254	2300	ug/kg	U	R	11
IY86	T117-C1-SB-05	06-802-IY86E	SW8082	Aroclor 1260	2300	ug/kg	U	R	11
IY86	T117-C6-SB-5.0-6.5	06-811-IY86N	SW8082	Aroclor 1260	80000	ug/kg	E	R	20
IY86	T117-C6-SB-5.0-6.5	06-811-IY86NDL	SW8082	Aroclor 1016	24000	ug/kg	U	R	11
IY86	T117-C6-SB-5.0-6.5	06-811-IY86NDL	SW8082	Aroclor 1221	24000	ug/kg	U	R	11
IY86	T117-C6-SB-5.0-6.5	06-811-IY86NDL	SW8082	Aroclor 1232	24000	ug/kg	U	R	11
IY86	T117-C6-SB-5.0-6.5	06-811-IY86NDL	SW8082	Aroclor 1242	24000	ug/kg	U	R	11
IY86	T117-C6-SB-5.0-6.5	06-811-IY86NDL	SW8082	Aroclor 1248	24000	ug/kg	U	R	11
IY86	T117-C6-SB-5.0-6.5	06-811-IY86NDL	SW8082	Aroclor 1254	24000	ug/kg	U	R	11
IY93	T117-C4-SB-5.0-6.5	06-866-IY93B	SW8082	Aroclor 1260	25000	ug/kg	E	R	20
IY93	T117-C4-SB-5.0-6.5	06-866-IY93BDL	SW8082	Aroclor 1016	9000	ug/kg	U	R	11
IY93	T117-C4-SB-5.0-6.5	06-866-IY93BDL	SW8082	Aroclor 1221	9000	ug/kg	U	R	11
IY93	T117-C4-SB-5.0-6.5	06-866-IY93BDL	SW8082	Aroclor 1232	9000	ug/kg	U	R	11
IY93	T117-C4-SB-5.0-6.5	06-866-IY93BDL	SW8082	Aroclor 1242	9000	ug/kg	U	R	11
IY93	T117-C4-SB-5.0-6.5	06-866-IY93BDL	SW8082	Aroclor 1248	9000	ug/kg	U	R	11
IY93	T117-C4-SB-5.0-6.5	06-866-IY93BDL	SW8082	Aroclor 1254	9000	ug/kg	U	R	11
IY93	T117-C4-SB-6.5-8.0	06-867-IY93C	NWTPH-Dx	Motor Oil	560	mg/kg		J	5B
IY93	T117-C4-SB-3.5-5.0	06-865-IY93A	SW8270D	Anthracene	130000	ug/kg	E	R	20

Qualified Data Summary Table
Port of Seattle
Terminal 117 Upland Investigation

SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Unit	Laboratory Qualifier	Validation Qualifier	Reason Code
IY93	T117-C4-SB-3.5-5.0	06-865-IY93A	SW8270D	Benzo(a)anthracene	170000	ug/kg	E	R	20
IY93	T117-C4-SB-3.5-5.0	06-865-IY93A	SW8270D	Benzo(a)pyrene	120000	ug/kg	E	R	20
IY93	T117-C4-SB-3.5-5.0	06-865-IY93A	SW8270D	Benzo(b)fluoranthene	130000	ug/kg	E	R	20
IY93	T117-C4-SB-3.5-5.0	06-865-IY93A	SW8270D	Chrysene	140000	ug/kg	E	R	20
IY93	T117-C4-SB-3.5-5.0	06-865-IY93A	SW8270D	Fluoranthene	450000	ug/kg	E	R	20
IY93	T117-C4-SB-3.5-5.0	06-865-IY93A	SW8270D	Phenanthrene	370000	ug/kg	E	R	20
IY93	T117-C4-SB-3.5-5.0	06-865-IY93A	SW8270D	Pyrene	250000	ug/kg	E	R	20
IY93	T117-C4-SB-3.5-5.0	06-865-IY93ADL	SW8270D	1-Methylnaphthalene	10000	ug/kg		R	11
IY93	T117-C4-SB-3.5-5.0	06-865-IY93ADL	SW8270D	2-Methylnaphthalene	14000	ug/kg		R	11
IY93	T117-C4-SB-3.5-5.0	06-865-IY93ADL	SW8270D	Acenaphthene	63000	ug/kg		R	11
IY93	T117-C4-SB-3.5-5.0	06-865-IY93ADL	SW8270D	Acenaphthylene	8000	ug/kg	U	R	11
IY93	T117-C4-SB-3.5-5.0	06-865-IY93ADL	SW8270D	Benzo(g,h,i)perylene	28000	ug/kg		R	11
IY93	T117-C4-SB-3.5-5.0	06-865-IY93ADL	SW8270D	Benzo(k)fluoranthene	130000	ug/kg		R	11
IY93	T117-C4-SB-3.5-5.0	06-865-IY93ADL	SW8270D	Dibenz(a,h)anthracene	9000	ug/kg		R	11
IY93	T117-C4-SB-3.5-5.0	06-865-IY93ADL	SW8270D	Dibenzofuran	48000	ug/kg		R	11
IY93	T117-C4-SB-3.5-5.0	06-865-IY93ADL	SW8270D	Fluorene	87000	ug/kg		R	11
IY93	T117-C4-SB-3.5-5.0	06-865-IY93ADL	SW8270D	Indeno(1,2,3-cd)pyrene	38000	ug/kg		R	11
IY93	T117-C4-SB-3.5-5.0	06-865-IY93ADL	SW8270D	Naphthalene	13000	ug/kg		R	11
IY93	T117-C4-SB-5.0-6.5	06-866-IY93B	SW8270D	Benzo(g,h,i)perylene	270	ug/kg	U	UJ	19
IY93	T117-C4-SB-5.0-6.5	06-866-IY93B	SW8270D	Dibenz(a,h)anthracene	270	ug/kg	U	UJ	19
IY93	T117-C4-SB-5.0-6.5	06-866-IY93B	SW8270D	Indeno(1,2,3-cd)pyrene	270	ug/kg	U	UJ	19
IY93	T117-C4-SB-5.0-6.5	06-866-IY93BDL	SW8270D	Acenaphthene	800	ug/kg	U	R	11
IY93	T117-C4-SB-5.0-6.5	06-866-IY93BDL	SW8270D	Acenaphthylene	800	ug/kg	U	R	11
IY93	T117-C4-SB-5.0-6.5	06-866-IY93BDL	SW8270D	Anthracene	800	ug/kg	U	R	11
IY93	T117-C4-SB-5.0-6.5	06-866-IY93BDL	SW8270D	Benzo(a)anthracene	800	ug/kg	U	R	11
IY93	T117-C4-SB-5.0-6.5	06-866-IY93BDL	SW8270D	Benzo(a)pyrene	800	ug/kg	U	R	11
IY93	T117-C4-SB-5.0-6.5	06-866-IY93BDL	SW8270D	Benzo(b)fluoranthene	800	ug/kg	U	R	11
IY93	T117-C4-SB-5.0-6.5	06-866-IY93BDL	SW8270D	Benzo(g,h,i)perylene	800	ug/kg	U	R	11
IY93	T117-C4-SB-5.0-6.5	06-866-IY93BDL	SW8270D	Benzo(k)fluoranthene	800	ug/kg	U	R	11
IY93	T117-C4-SB-5.0-6.5	06-866-IY93BDL	SW8270D	Chrysene	690	ug/kg	J	R	11
IY93	T117-C4-SB-5.0-6.5	06-866-IY93BDL	SW8270D	Dibenz(a,h)anthracene	800	ug/kg	U	R	11
IY93	T117-C4-SB-5.0-6.5	06-866-IY93BDL	SW8270D	Dibenzofuran	800	ug/kg	U	R	11
IY93	T117-C4-SB-5.0-6.5	06-866-IY93BDL	SW8270D	Fluoranthene	800	ug/kg	U	R	11
IY93	T117-C4-SB-5.0-6.5	06-866-IY93BDL	SW8270D	Fluorene	520	ug/kg	J	R	11
IY93	T117-C4-SB-5.0-6.5	06-866-IY93BDL	SW8270D	Indeno(1,2,3-cd)pyrene	800	ug/kg	U	R	11
IY93	T117-C4-SB-5.0-6.5	06-866-IY93BDL	SW8270D	Pyrene	800	ug/kg	U	R	11
IY93	T117-C4-SB-6.5-8.0	06-867-IY93C	SW8270D	Benzo(g,h,i)perylene	65	ug/kg	U	UJ	19
IY93	T117-C4-SB-6.5-8.0	06-867-IY93C	SW8270D	Dibenz(a,h)anthracene	65	ug/kg	U	UJ	19
IY93	T117-C4-SB-6.5-8.0	06-867-IY93C	SW8270D	Indeno(1,2,3-cd)pyrene	65	ug/kg	U	UJ	19
IY93	T117-C4-SB-6.5-8.0	06-867-IY93CDL	SW8270D	2-Methylnaphthalene	200	ug/kg	U	R	11
IY93	T117-C4-SB-6.5-8.0	06-867-IY93CDL	SW8270D	Acenaphthene	110	ug/kg	J	R	11
IY93	T117-C4-SB-6.5-8.0	06-867-IY93CDL	SW8270D	Acenaphthylene	200	ug/kg	U	R	11
IY93	T117-C4-SB-6.5-8.0	06-867-IY93CDL	SW8270D	Anthracene	150	ug/kg	J	R	11
IY93	T117-C4-SB-6.5-8.0	06-867-IY93CDL	SW8270D	Benzo(a)anthracene	200	ug/kg	U	R	11
IY93	T117-C4-SB-6.5-8.0	06-867-IY93CDL	SW8270D	Benzo(a)pyrene	200	ug/kg	U	R	11
IY93	T117-C4-SB-6.5-8.0	06-867-IY93CDL	SW8270D	Benzo(b)fluoranthene	200	ug/kg	U	R	11
IY93	T117-C4-SB-6.5-8.0	06-867-IY93CDL	SW8270D	Benzo(g,h,i)perylene	200	ug/kg	U	R	11
IY93	T117-C4-SB-6.5-8.0	06-867-IY93CDL	SW8270D	Benzo(k)fluoranthene	200	ug/kg	U	R	11
IY93	T117-C4-SB-6.5-8.0	06-867-IY93CDL	SW8270D	Dibenz(a,h)anthracene	200	ug/kg	U	R	11

Qualified Data Summary Table
Port of Seattle
Terminal 117 Upland Investigation

SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Unit	Laboratory Qualifier	Validation Qualifier	Reason Code
IY93	T117-C4-SB-6.5-8.0	06-867-IY93CDL	SW8270D	Dibenzofuran	200	ug/kg	U	R	11
IY93	T117-C4-SB-6.5-8.0	06-867-IY93CDL	SW8270D	Fluoranthene	200	ug/kg	U	R	11
IY93	T117-C4-SB-6.5-8.0	06-867-IY93CDL	SW8270D	Indeno(1,2,3-cd)pyrene	200	ug/kg	U	R	11
IY93	T117-C4-SB-6.5-8.0	06-867-IY93CDL	SW8270D	Naphthalene	200	ug/kg	U	R	11
IZ04	T117-B8-SB-01	06-914-IZ04A	SW8082	Aroclor 1260	9600000	ug/kg	E	R	20
IZ04	T117-B8-SB-01	06-914-IZ04A	SW6010B	Arsenic	10	mg/kg	U	UJ	8
IZ04	T117-B8-SB-01	06-914-IZ04A	NWTPH-Dx	Diesel Range Hydrocarbons	4300	mg/kg		J	2
IZ04	T117-B8-SB-01	06-914-IZ04A	NWTPHG	Gasoline Range Hydrocarbons	70	mg/kg		J	2
IZ04	T117-B8-SB-01	06-914-IZ04A	SW6010B	Lead	50	mg/kg		J	8
IZ04	T117-B8-SB-01	06-914-IZ04A	NWTPH-Dx	Motor Oil	3000	mg/kg		J	2
IZ04	T117-B8-SB-01	06-914-IZ04ADL	SW8082	Aroclor 1016	2100000	ug/kg	U	R	11
IZ04	T117-B8-SB-01	06-914-IZ04ADL	SW8082	Aroclor 1221	2100000	ug/kg	U	R	11
IZ04	T117-B8-SB-01	06-914-IZ04ADL	SW8082	Aroclor 1232	2100000	ug/kg	U	R	11
IZ04	T117-B8-SB-01	06-914-IZ04ADL	SW8082	Aroclor 1242	2100000	ug/kg	U	R	11
IZ04	T117-B8-SB-01	06-914-IZ04ADL	SW8082	Aroclor 1248	2100000	ug/kg	U	R	11
IZ04	T117-B8-SB-01	06-914-IZ04ADL	SW8082	Aroclor 1254	2100000	ug/kg	U	R	11
IZ04	T117-B8-SB-02	06-915-IZ04B	SW8082	Aroclor 1260	1500000	ug/kg	E	R	20
IZ04	T117-B8-SB-02	06-915-IZ04B	SW6010B	Arsenic	6	mg/kg	U	UJ	8
IZ04	T117-B8-SB-02	06-915-IZ04B	NWTPH-Dx	Diesel Range Hydrocarbons	490	mg/kg		J	2
IZ04	T117-B8-SB-02	06-915-IZ04B	SW6010B	Lead	12	mg/kg		J	8
IZ04	T117-B8-SB-02	06-915-IZ04B	NWTPH-Dx	Motor Oil	640	mg/kg		J	2
IZ04	T117-B8-SB-02	06-915-IZ04BDL	SW8082	Aroclor 1016	460000	ug/kg	U	R	11
IZ04	T117-B8-SB-02	06-915-IZ04BDL	SW8082	Aroclor 1221	460000	ug/kg	U	R	11
IZ04	T117-B8-SB-02	06-915-IZ04BDL	SW8082	Aroclor 1232	460000	ug/kg	U	R	11
IZ04	T117-B8-SB-02	06-915-IZ04BDL	SW8082	Aroclor 1242	460000	ug/kg	U	R	11
IZ04	T117-B8-SB-02	06-915-IZ04BDL	SW8082	Aroclor 1248	460000	ug/kg	U	R	11
IZ04	T117-B8-SB-02	06-915-IZ04BDL	SW8082	Aroclor 1254	460000	ug/kg	U	R	11
IZ04	T117-B8-SB-03	06-916-IZ04C	SW6010B	Arsenic	6	mg/kg	U	UJ	8
IZ04	T117-B8-SB-03	06-916-IZ04C	SW6010B	Lead	5	mg/kg		J	8
IZ04	T117-B8-SB-214	06-917-IZ04D	SW8082	Aroclor 1260	1900000	ug/kg	E	R	20
IZ04	T117-B8-SB-214	06-917-IZ04D	SW6010B	Arsenic	5	mg/kg	U	UJ	8
IZ04	T117-B8-SB-214	06-917-IZ04D	NWTPH-Dx	Diesel Range Hydrocarbons	680	mg/kg		J	2
IZ04	T117-B8-SB-214	06-917-IZ04D	SW6010B	Lead	15	mg/kg		J	8
IZ04	T117-B8-SB-214	06-917-IZ04D	NWTPH-Dx	Motor Oil	690	mg/kg		J	2
IZ04	T117-B8-SB-214	06-917-IZ04DDL	SW8082	Aroclor 1016	440000	ug/kg	U	R	11
IZ04	T117-B8-SB-214	06-917-IZ04DDL	SW8082	Aroclor 1221	440000	ug/kg	U	R	11
IZ04	T117-B8-SB-214	06-917-IZ04DDL	SW8082	Aroclor 1232	440000	ug/kg	U	R	11
IZ04	T117-B8-SB-214	06-917-IZ04DDL	SW8082	Aroclor 1242	440000	ug/kg	U	R	11
IZ04	T117-B8-SB-214	06-917-IZ04DDL	SW8082	Aroclor 1248	440000	ug/kg	U	R	11
IZ04	T117-B8-SB-214	06-917-IZ04DDL	SW8082	Aroclor 1254	440000	ug/kg	U	R	11
IZ04	T117-D9-SB-01	06-918-IZ04E	SW6010B	Arsenic	9	mg/kg		J	8
IZ04	T117-D9-SB-01	06-918-IZ04E	SW6010B	Lead	32	mg/kg		J	8
IZ04	T117-D9-SB-02	06-919-IZ04F	SW8082	Aroclor 1260	5000	ug/kg	E	R	20
IZ04	T117-D9-SB-02	06-919-IZ04F	SW6010B	Arsenic	7	mg/kg		J	8
IZ04	T117-D9-SB-02	06-919-IZ04F	SW6010B	Lead	21	mg/kg		J	8

Qualified Data Summary Table
Port of Seattle
Terminal 117 Upland Investigation

SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Unit	Laboratory Qualifier	Validation Qualifier	Reason Code
IZ04	T117-D9-SB-02	06-919-IZ04FDL	SW8082	Aroclor 1016	1200	ug/kg	U	R	11
IZ04	T117-D9-SB-02	06-919-IZ04FDL	SW8082	Aroclor 1221	1200	ug/kg	U	R	11
IZ04	T117-D9-SB-02	06-919-IZ04FDL	SW8082	Aroclor 1232	1200	ug/kg	U	R	11
IZ04	T117-D9-SB-02	06-919-IZ04FDL	SW8082	Aroclor 1242	1200	ug/kg	U	R	11
IZ04	T117-D9-SB-02	06-919-IZ04FDL	SW8082	Aroclor 1248	1200	ug/kg	U	R	11
IZ04	T117-D9-SB-02	06-919-IZ04FDL	SW8082	Aroclor 1254	1200	ug/kg	U	R	11
IZ04	T117-D9-SB-03	06-920-IZ04G	SW6010B	Arsenic	5	mg/kg	U	UJ	8
IZ04	T117-D9-SB-03	06-920-IZ04G	SW6010B	Lead	2	mg/kg	U	UJ	8
IZ04	T117-D10-SB-01	06-921-IZ04H	SW8082	Aroclor 1260	58000	ug/kg	E	R	20
IZ04	T117-D10-SB-01	06-921-IZ04H	SW6010B	Arsenic	180	mg/kg		J	8
IZ04	T117-D10-SB-01	06-921-IZ04H	SW6010B	Copper	117	mg/kg		J	8
IZ04	T117-D10-SB-01	06-921-IZ04H	SW6010B	Lead	238	mg/kg		J	8
IZ04	T117-D10-SB-01	06-921-IZ04HDL	SW8082	Aroclor 1016	17000	ug/kg	U	R	11
IZ04	T117-D10-SB-01	06-921-IZ04HDL	SW8082	Aroclor 1221	17000	ug/kg	U	R	11
IZ04	T117-D10-SB-01	06-921-IZ04HDL	SW8082	Aroclor 1232	17000	ug/kg	U	R	11
IZ04	T117-D10-SB-01	06-921-IZ04HDL	SW8082	Aroclor 1242	17000	ug/kg	U	R	11
IZ04	T117-D10-SB-01	06-921-IZ04HDL	SW8082	Aroclor 1248	17000	ug/kg	U	R	11
IZ04	T117-D10-SB-01	06-921-IZ04HDL	SW8082	Aroclor 1254	17000	ug/kg	U	R	11
IZ04	T117-D10-SB-01LR	06-921-IZ04HDP	SW6010B	Arsenic	140	mg/kg		J	8
IZ04	T117-D10-SB-01LR	06-921-IZ04HDP	SW6010B	Copper	95.9	mg/kg		J	8
IZ04	T117-D10-SB-01LR	06-921-IZ04HDP	SW6010B	Lead	175	mg/kg		J	8
IZ04	T117-D10-SB-02	06-922-IZ04I	SW6010B	Arsenic	6	mg/kg	U	UJ	8
IZ04	T117-D10-SB-02	06-922-IZ04I	SW6010B	Copper	14.8	mg/kg		J	8
IZ04	T117-D10-SB-02	06-922-IZ04I	SW6010B	Lead	3	mg/kg		J	8
IZ04	T117-D10-SB-03	06-923-IZ04J	SW6010B	Arsenic	6	mg/kg	U	UJ	8
IZ04	T117-D10-SB-03	06-923-IZ04J	SW6010B	Copper	18.6	mg/kg		J	8
IZ04	T117-D10-SB-03	06-923-IZ04J	SW6010B	Lead	2	mg/kg		J	8
IZ04	T117-E3-SB-01	06-924-IZ04K	SW6010B	Arsenic	9	mg/kg		J	8
IZ04	T117-E3-SB-01	06-924-IZ04K	NWTPH-Dx	Diesel Range Hydrocarbons	440	mg/kg		J	2
IZ04	T117-E3-SB-01	06-924-IZ04K	SW6010B	Lead	28	mg/kg		J	8
IZ04	T117-E3-SB-01	06-924-IZ04K	NWTPH-Dx	Motor Oil	700	mg/kg		J	2
IZ04	T117-E3-SB-02	06-925-IZ04L	SW6010B	Arsenic	8	mg/kg		J	8
IZ04	T117-E3-SB-02	06-925-IZ04L	NWTPH-Dx	Diesel Range Hydrocarbons	100	mg/kg		J	2
IZ04	T117-E3-SB-02	06-925-IZ04L	SW6010B	Lead	15	mg/kg		J	8
IZ04	T117-E3-SB-02	06-925-IZ04L	NWTPH-Dx	Motor Oil	160	mg/kg		J	2
IZ04	T117-E3-SB-03	06-926-IZ04M	SW6010B	Arsenic	6	mg/kg	U	UJ	8
IZ04	T117-E3-SB-03	06-926-IZ04M	SW6010B	Lead	4	mg/kg		J	8
IZ05	T117-F6-SB-03	06-929-IZ05C	SW8082	Aroclor 1260	13000	ug/kg	E	R	20
IZ05	T117-F6-SB-03	06-929-IZ05CDL	SW8082	Aroclor 1016	2700	ug/kg	U	R	11
IZ05	T117-F6-SB-03	06-929-IZ05CDL	SW8082	Aroclor 1221	2700	ug/kg	U	R	11
IZ05	T117-F6-SB-03	06-929-IZ05CDL	SW8082	Aroclor 1232	2700	ug/kg	U	R	11
IZ05	T117-F6-SB-03	06-929-IZ05CDL	SW8082	Aroclor 1242	2700	ug/kg	U	R	11
IZ05	T117-F6-SB-03	06-929-IZ05CDL	SW8082	Aroclor 1248	2700	ug/kg	U	R	11
IZ05	T117-F6-SB-03	06-929-IZ05CDL	SW8082	Aroclor 1254	2700	ug/kg	U	R	11
IZ05	T117-F8-SB-02	06-939-IZ05M	SW8082	Aroclor 1260	7100	ug/kg	E	R	20
IZ05	T117-F8-SB-02	06-939-IZ05MDL	SW8082	Aroclor 1016	1300	ug/kg	U	R	11
IZ05	T117-F8-SB-02	06-939-IZ05MDL	SW8082	Aroclor 1221	1300	ug/kg	U	R	11

Qualified Data Summary Table
Port of Seattle
Terminal 117 Upland Investigation

SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Unit	Laboratory Qualifier	Validation Qualifier	Reason Code
IZ05	T117-F8-SB-02	06-939-IZ05MDL	SW8082	Aroclor 1232	1300	ug/kg	U	R	11
IZ05	T117-F8-SB-02	06-939-IZ05MDL	SW8082	Aroclor 1242	1300	ug/kg	U	R	11
IZ05	T117-F8-SB-02	06-939-IZ05MDL	SW8082	Aroclor 1248	1300	ug/kg	U	R	11
IZ05	T117-F8-SB-02	06-939-IZ05MDL	SW8082	Aroclor 1254	1300	ug/kg	U	R	11
IZ15	T117-F5-SB-01	06-1000-IZ15I	SW8270D	Benzo(g,h,i)perylene	64	ug/kg	U	UJ	5B
IZ15	T117-F5-SB-02	06-1001-IZ15J	SW8270D	Benzo(g,h,i)perylene	64	ug/kg	U	UJ	5B
IZ15	T117-F5-SB-03	06-1002-IZ15K	SW8270D	Benzo(g,h,i)perylene	65	ug/kg	U	UJ	5B
IZ15	T117-F5-SB-05	06-1003-IZ15L	SW8270D	Benzo(g,h,i)perylene	66	ug/kg	U	UJ	5B
IZ15	T117-F1-SB-01	06-1004-IZ15M	SW8270D	Benzo(g,h,i)perylene	66	ug/kg	U	UJ	5B
IZ15	T117-F1-SB-02	06-1005-IZ15N	SW8270D	Benzo(g,h,i)perylene	64	ug/kg	U	UJ	5B
IZ15	T117-F1-SB-03	06-1006-IZ15O	SW8270D	Benzo(g,h,i)perylene	52	ug/kg	J	J	5B
IZ15	T117-F1-SB-04	06-1007-IZ15P	SW8270D	Benzo(g,h,i)perylene	65	ug/kg	U	UJ	5B
IZ15	T117-F2-SB-04	06-998-IZ15G	SW8270D	Benzo(g,h,i)perylene	41	ug/kg	J	J	5B
IZ15	T117-F2-SB-05	06-999-IZ15H	SW8270D	Benzo(g,h,i)perylene	66	ug/kg	U	UJ	5B
IZ15	T117-F4-SB-01	06-992-IZ15A	SW8082	Aroclor 1260	13000	ug/kg	E	R	20
IZ15	T117-F4-SB-01	06-992-IZ15ADL	SW8082	Aroclor 1016	2800	ug/kg	U	R	11
IZ15	T117-F4-SB-01	06-992-IZ15ADL	SW8082	Aroclor 1221	2800	ug/kg	U	R	11
IZ15	T117-F4-SB-01	06-992-IZ15ADL	SW8082	Aroclor 1232	2800	ug/kg	U	R	11
IZ15	T117-F4-SB-01	06-992-IZ15ADL	SW8082	Aroclor 1242	2800	ug/kg	U	R	11
IZ15	T117-F4-SB-01	06-992-IZ15ADL	SW8082	Aroclor 1248	2800	ug/kg	U	R	11
IZ15	T117-F4-SB-01	06-992-IZ15ADL	SW8082	Aroclor 1254	2800	ug/kg	U	R	11
IZ15	T117-F5-SB-01	06-1000-IZ15I	SW8082	Aroclor 1260	62000	ug/kg	E	R	20
IZ15	T117-F5-SB-01	06-1000-IZ15IDL	SW8082	Aroclor 1016	14000	ug/kg	U	R	11
IZ15	T117-F5-SB-01	06-1000-IZ15IDL	SW8082	Aroclor 1221	14000	ug/kg	U	R	11
IZ15	T117-F5-SB-01	06-1000-IZ15IDL	SW8082	Aroclor 1232	14000	ug/kg	U	R	11
IZ15	T117-F5-SB-01	06-1000-IZ15IDL	SW8082	Aroclor 1242	14000	ug/kg	U	R	11
IZ15	T117-F5-SB-01	06-1000-IZ15IDL	SW8082	Aroclor 1248	14000	ug/kg	U	R	11
IZ15	T117-F5-SB-01	06-1000-IZ15IDL	SW8082	Aroclor 1254	14000	ug/kg	U	R	11
IZ15	T117-F1-SB-02	06-1005-IZ15N	SW8082	Aroclor 1260	83000	ug/kg	E	R	20
IZ15	T117-F1-SB-02	06-1005-IZ15NDL	SW8082	Aroclor 1016	18000	ug/kg	U	R	11
IZ15	T117-F1-SB-02	06-1005-IZ15NDL	SW8082	Aroclor 1221	18000	ug/kg	U	R	11
IZ15	T117-F1-SB-02	06-1005-IZ15NDL	SW8082	Aroclor 1232	18000	ug/kg	U	R	11
IZ15	T117-F1-SB-02	06-1005-IZ15NDL	SW8082	Aroclor 1242	18000	ug/kg	U	R	11
IZ15	T117-F1-SB-02	06-1005-IZ15NDL	SW8082	Aroclor 1248	18000	ug/kg	U	R	11
IZ15	T117-F1-SB-02	06-1005-IZ15NDL	SW8082	Aroclor 1254	18000	ug/kg	U	R	11
IZ16	T117-A11-SB-0.0-0.5	06-1017-IZ16J	SW8082	Aroclor 1260	150	ug/kg	P	J	3
IZ16	T117-A12-SB-0.0-0.5	06-1019-IZ16L	SW8082	Aroclor 1260	1100	ug/kg	P	J	3