APPENDIX C

TPH Chromatogram Assessment

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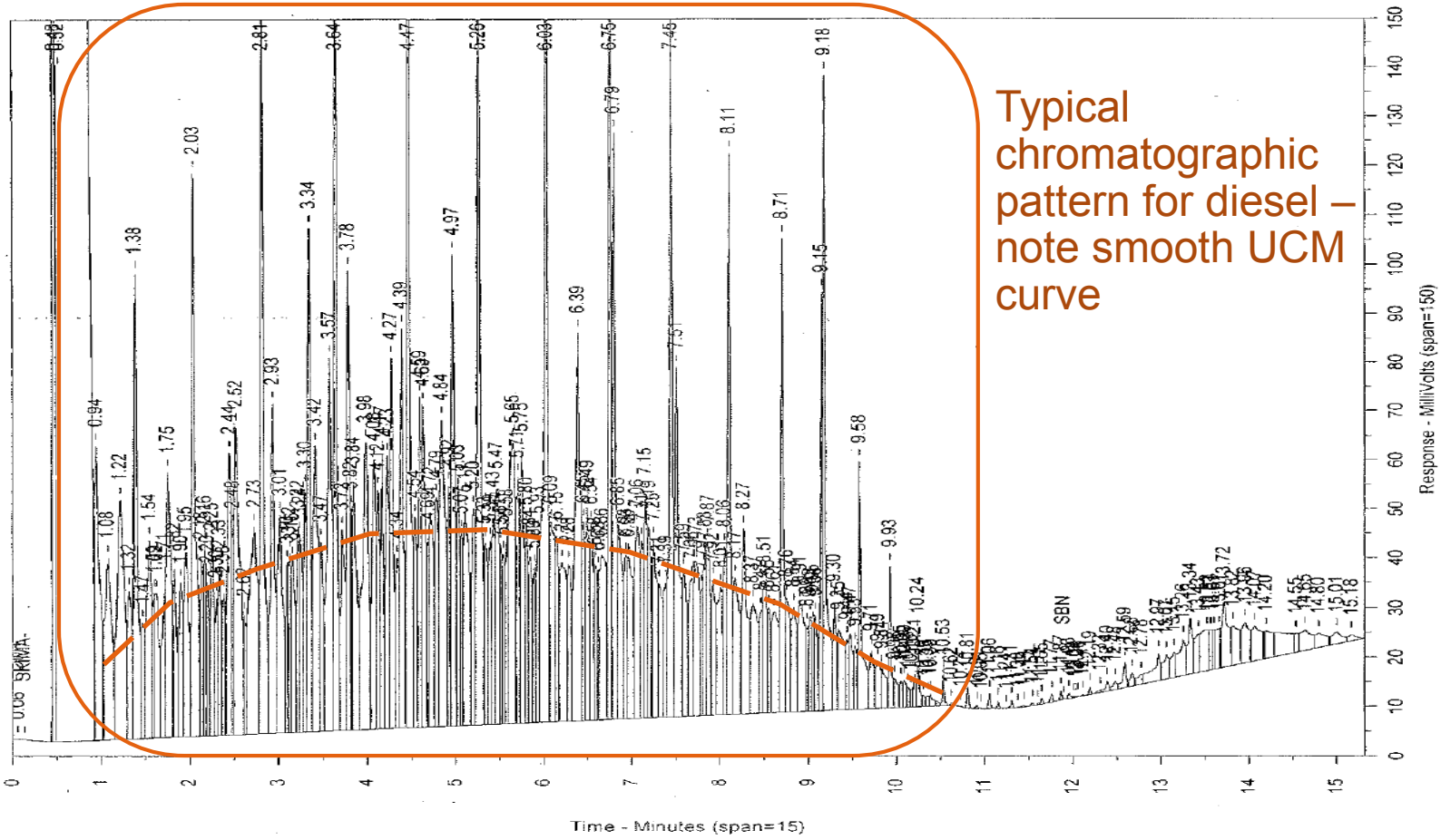
BP OLYMPIA, WA

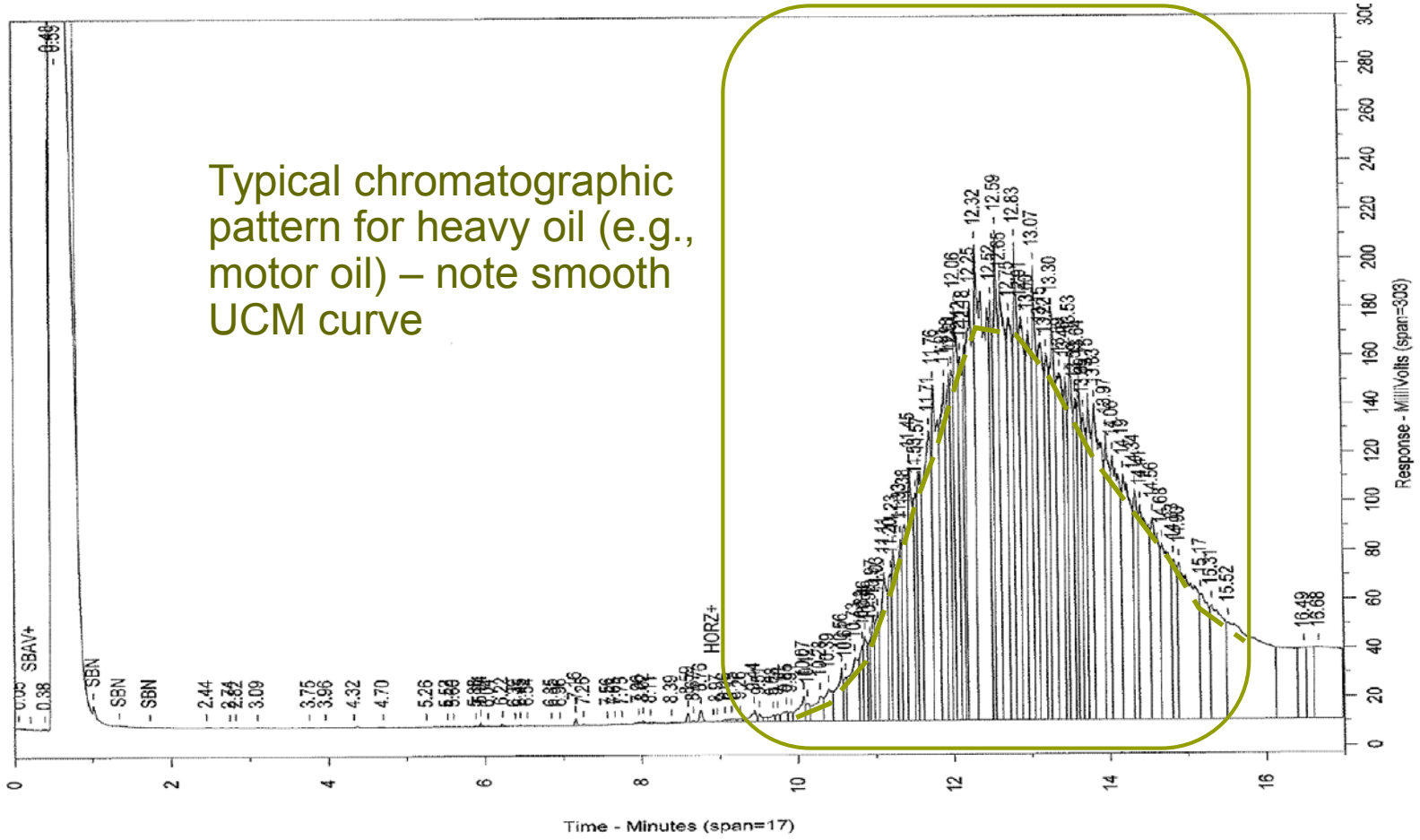
TPH Chromatogram Assessment

Laboratory Diesel Standard



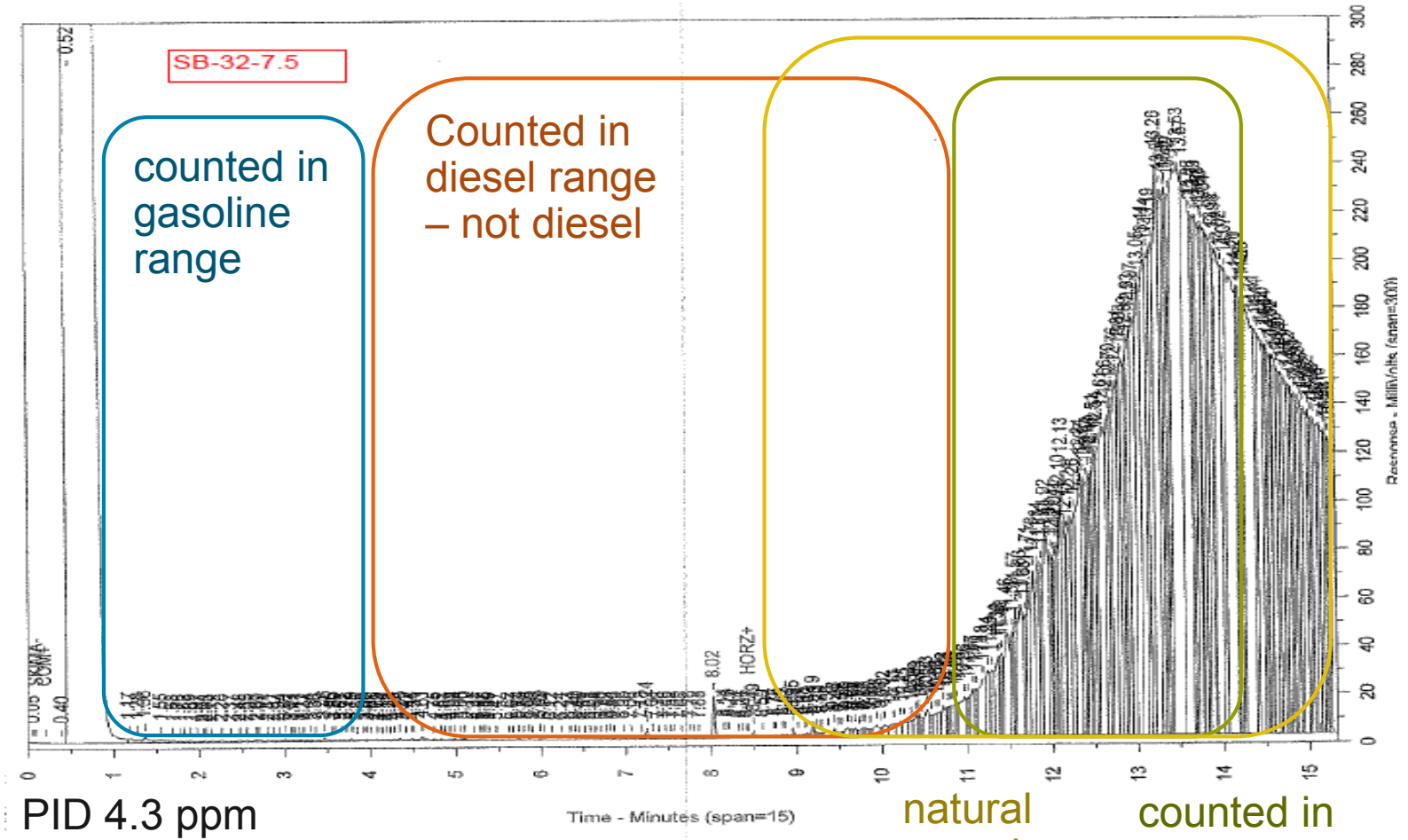
Laboratory Motor Oil Standard

Typical chromatographic pattern for heavy oil (e.g., motor oil) – note smooth UCM curve



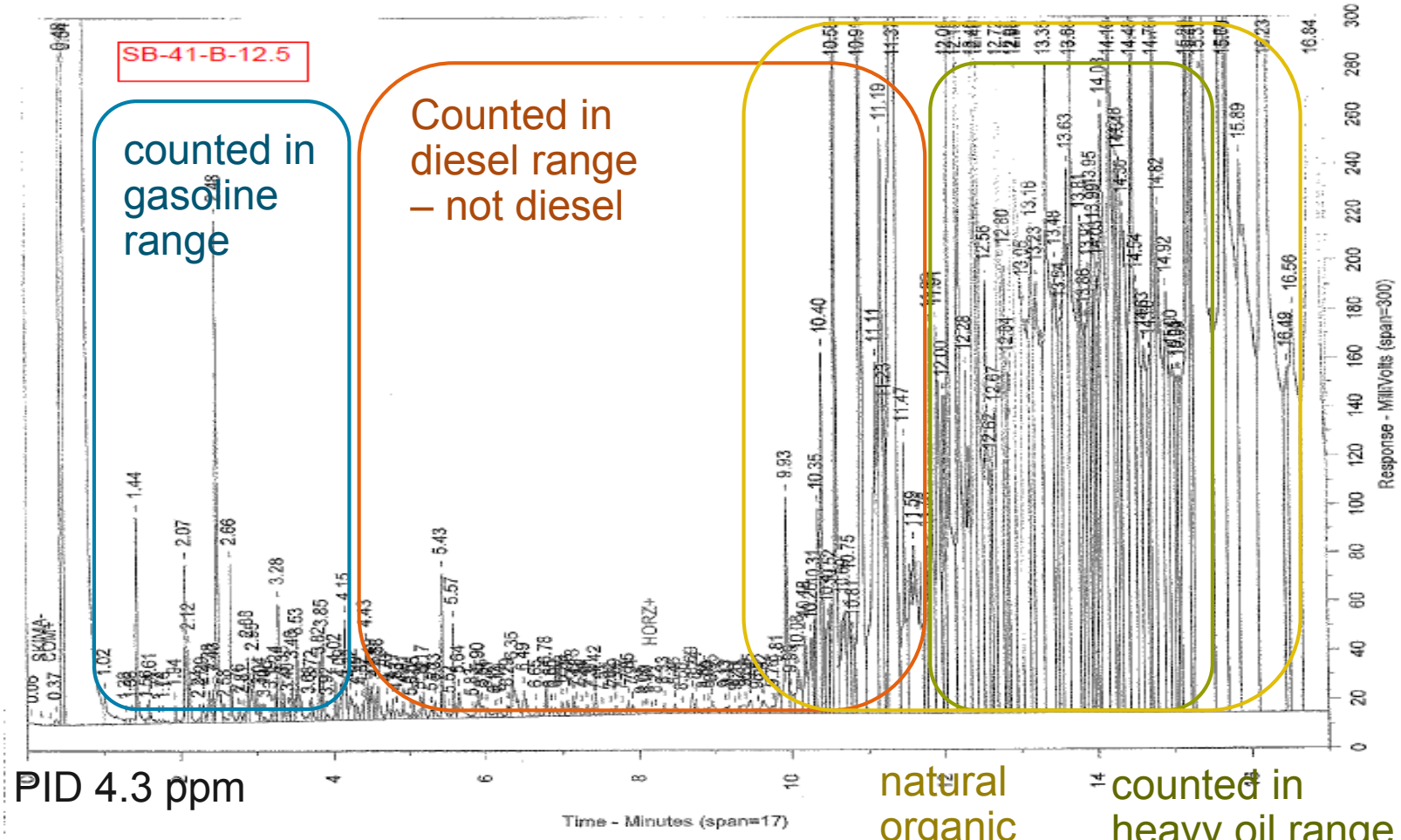
SB-32-7.5

GRO	<1.3 mg/kg
DRO	37 mg/kg
HRO	2,200 mg/kg



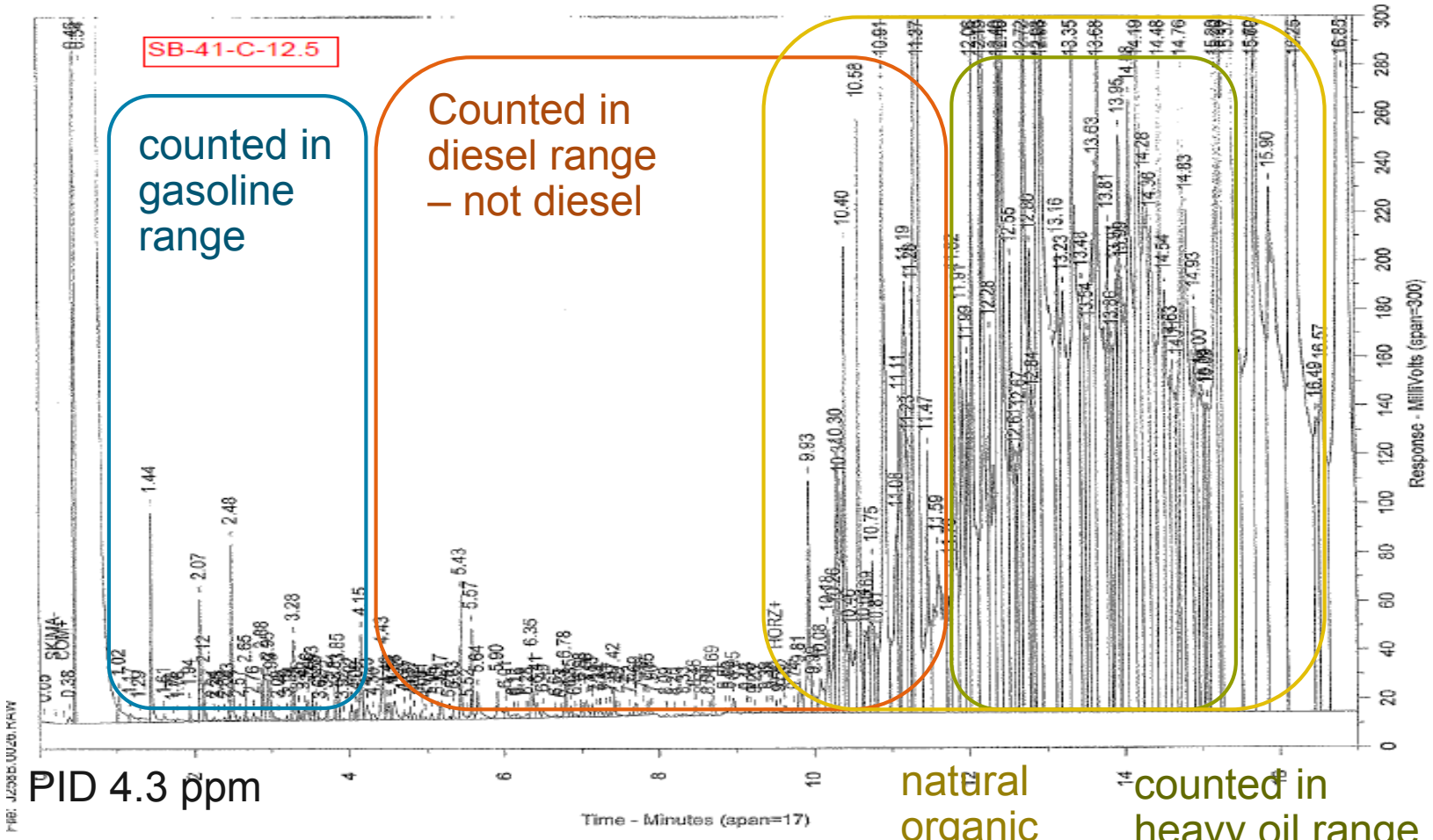
SB-41-B-12.5

GRO	63 mg/kg
DRO	780 mg/kg
HRO	2200 mg/kg



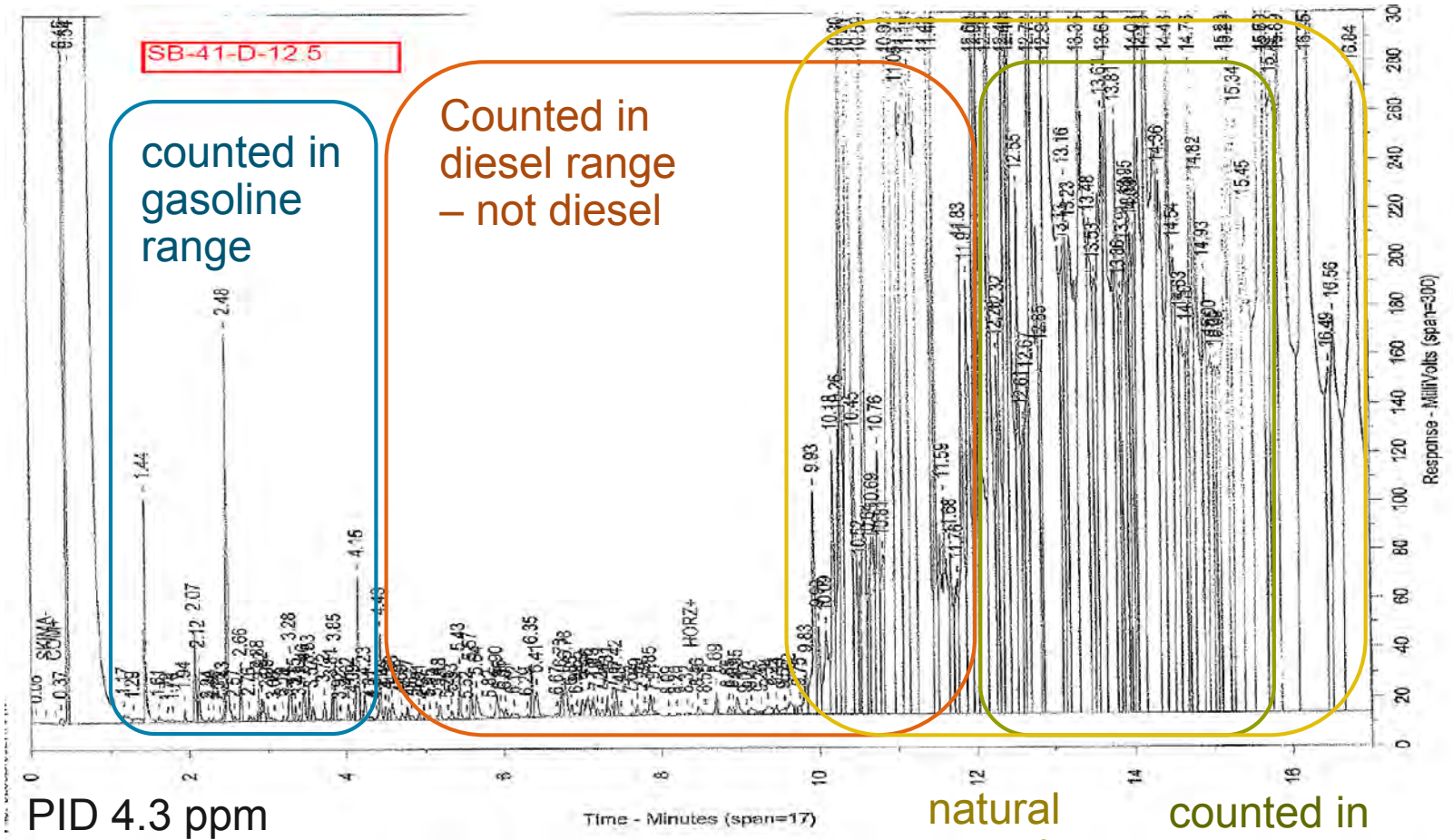
SB-41-C-12.5

GRO	83 mg/kg
DRO	920 mg/kg
HRO	2100 mg/kg

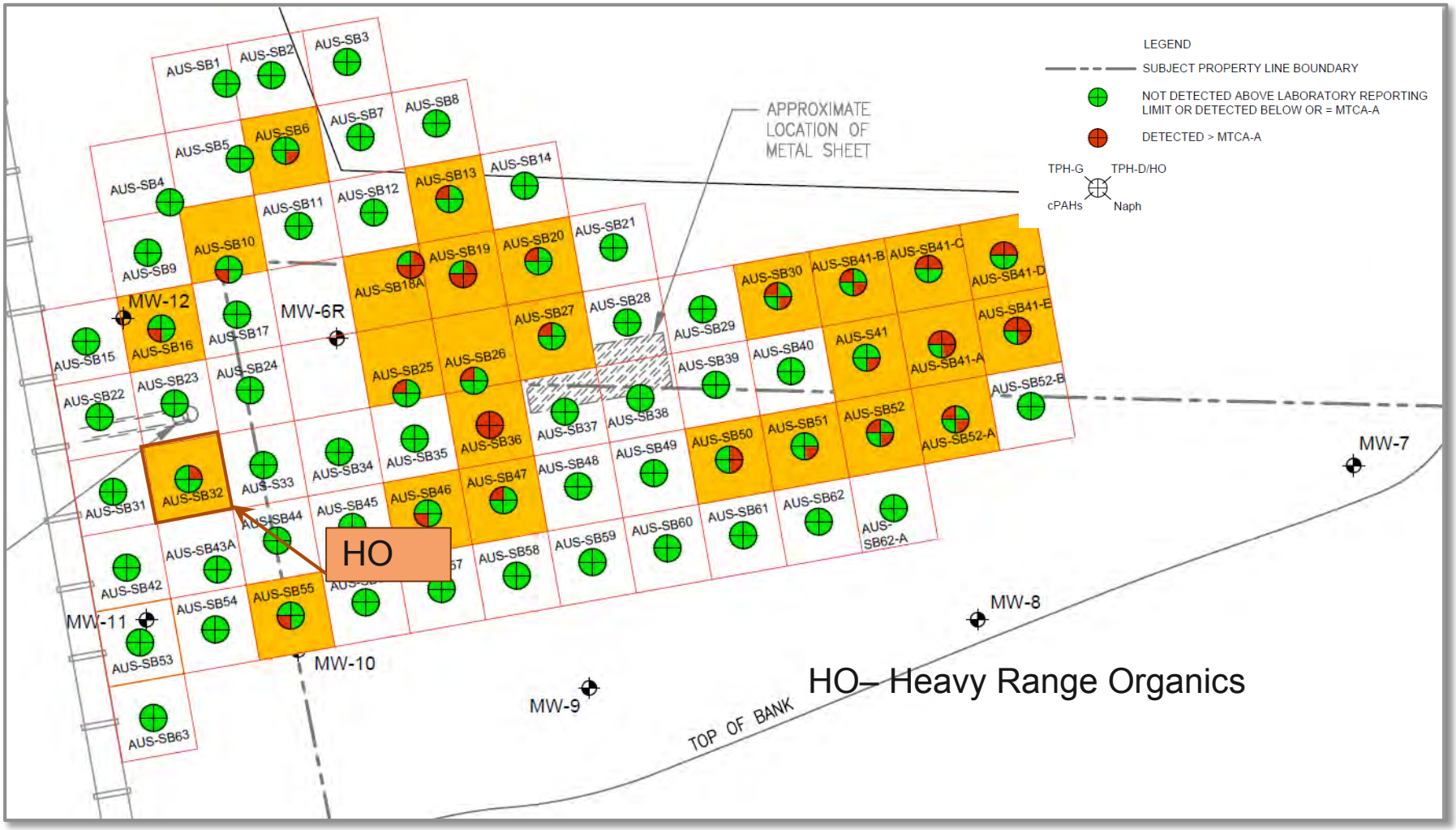


SB-41-D-12.5

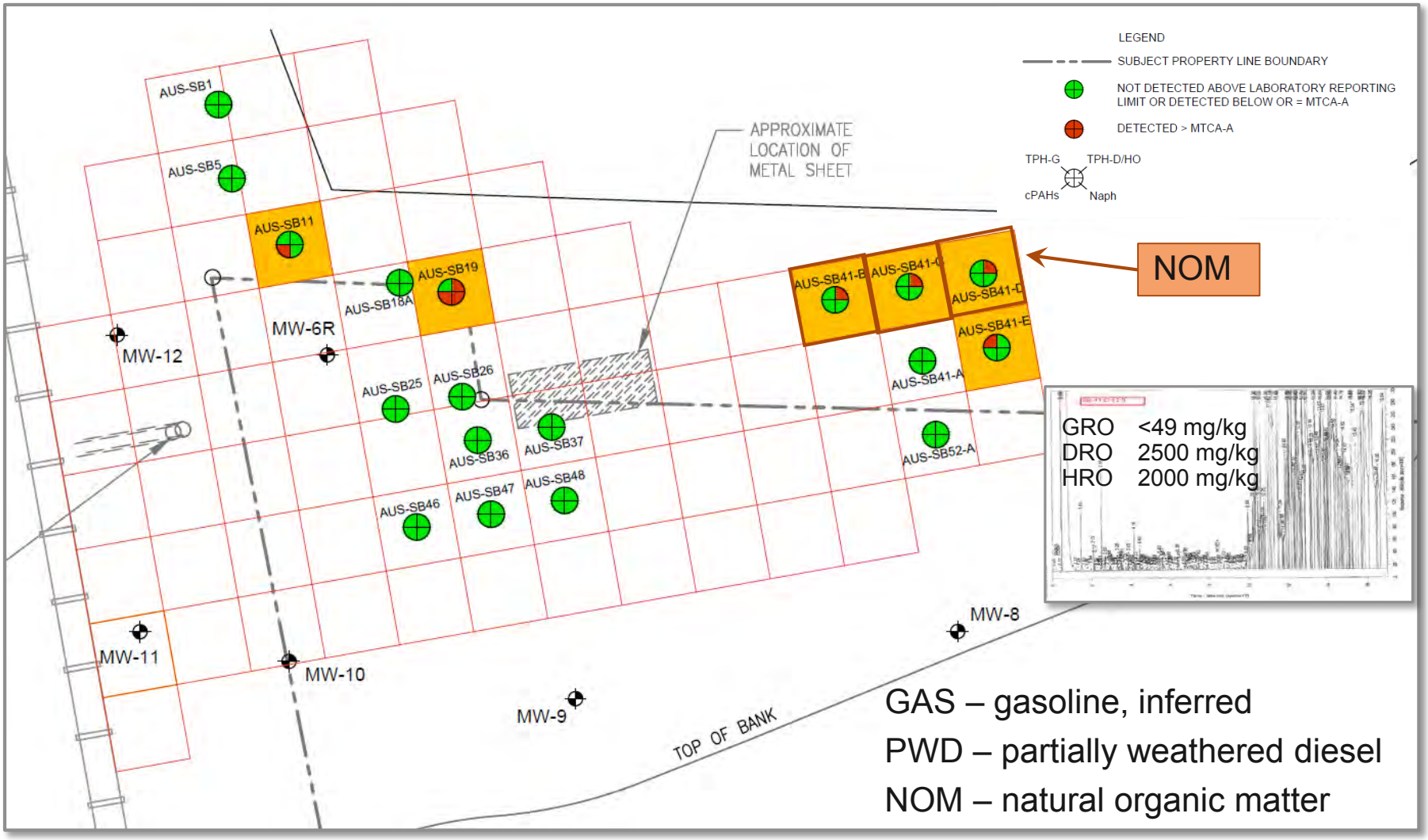
GRO	<49 mg/kg
DRO	2500 mg/kg
HRO	2000 mg/kg



Middle Depth Interval



Deep Depth Interval



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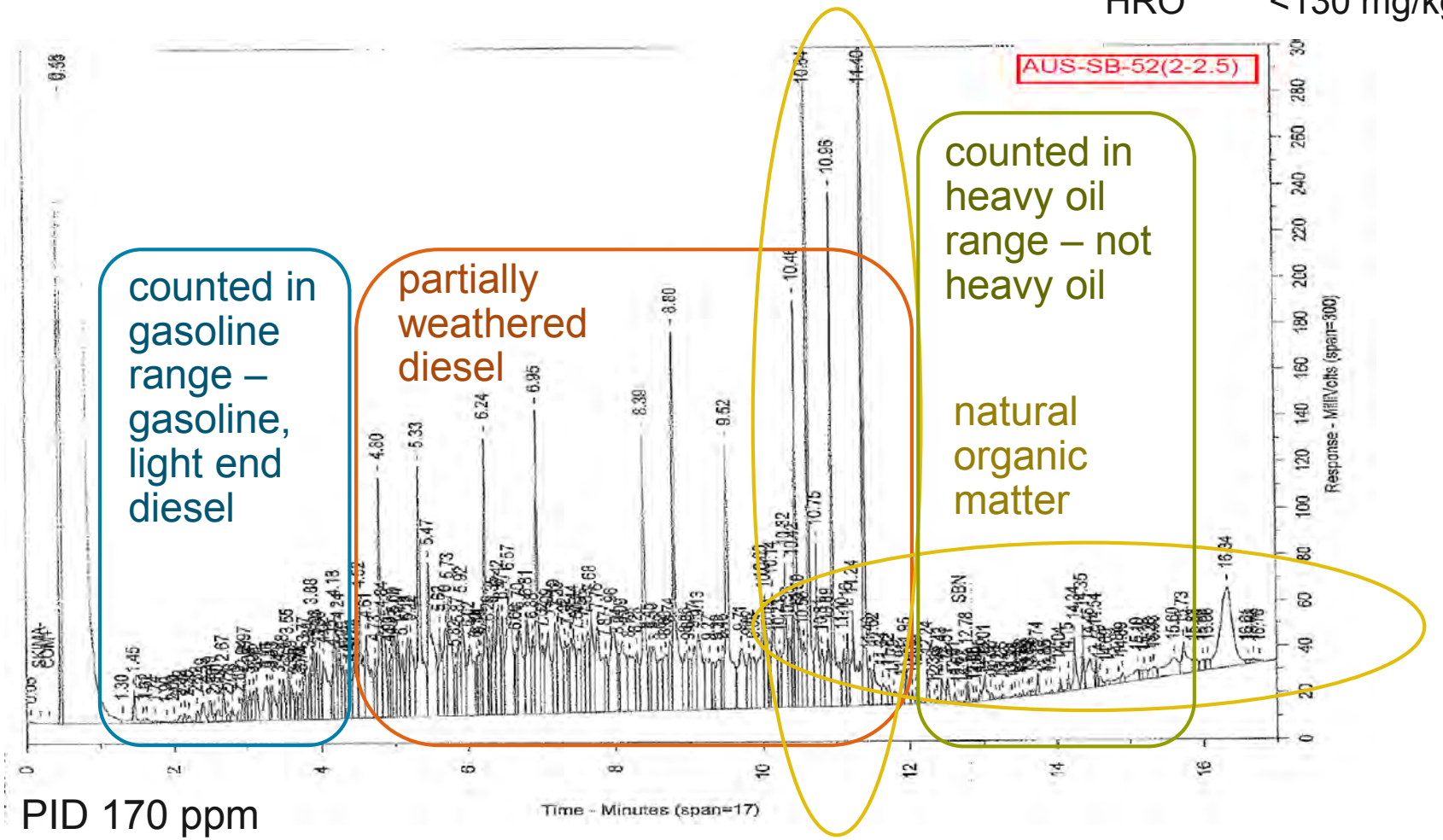
Extra Slides

Soil Sample Chromatogram

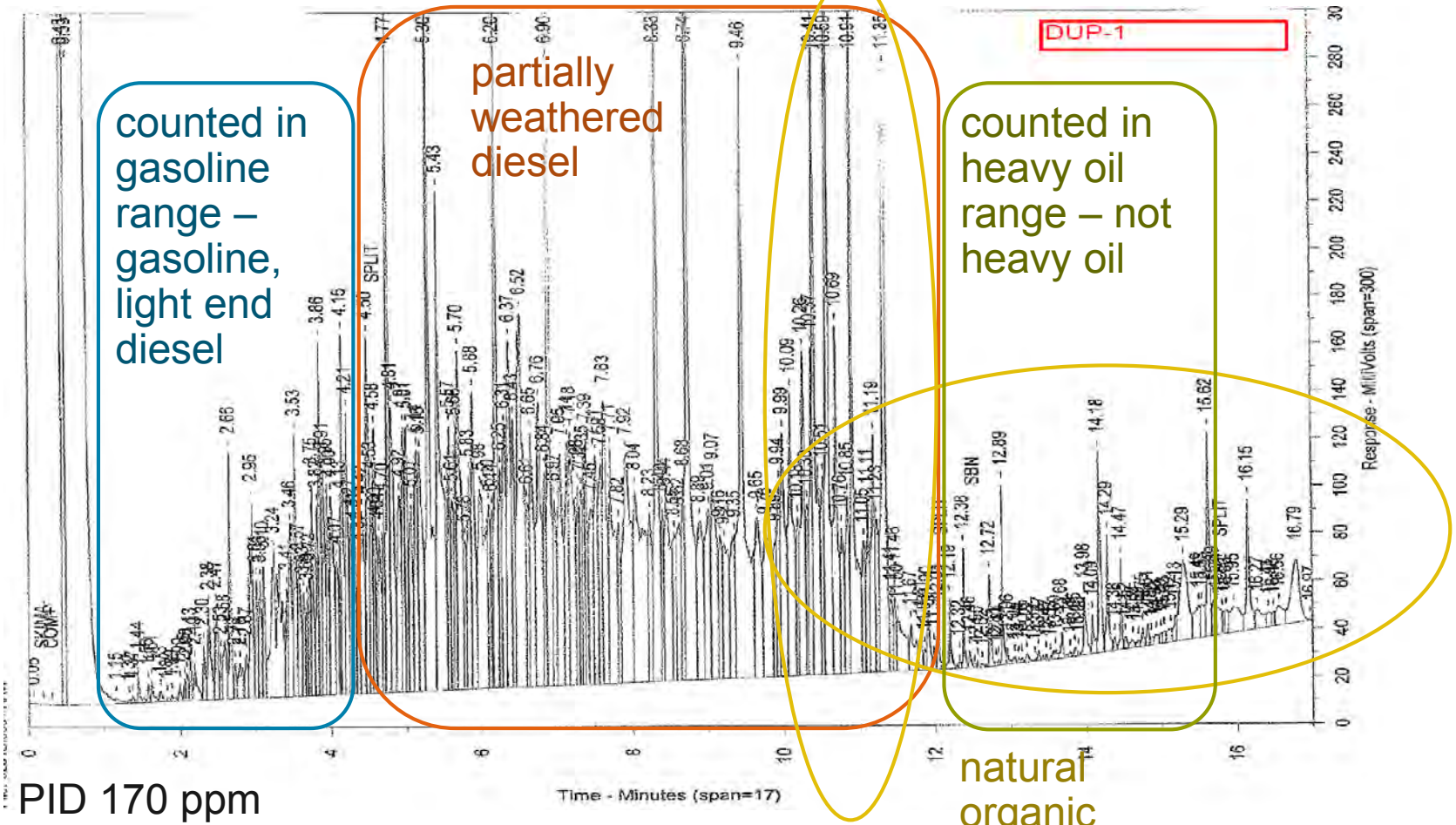
GRO	2400 mg/kg
DRO	1300 mg/kg
HRO	<130 mg/kg



PID 170 ppm

Soil Sample Chromatogram

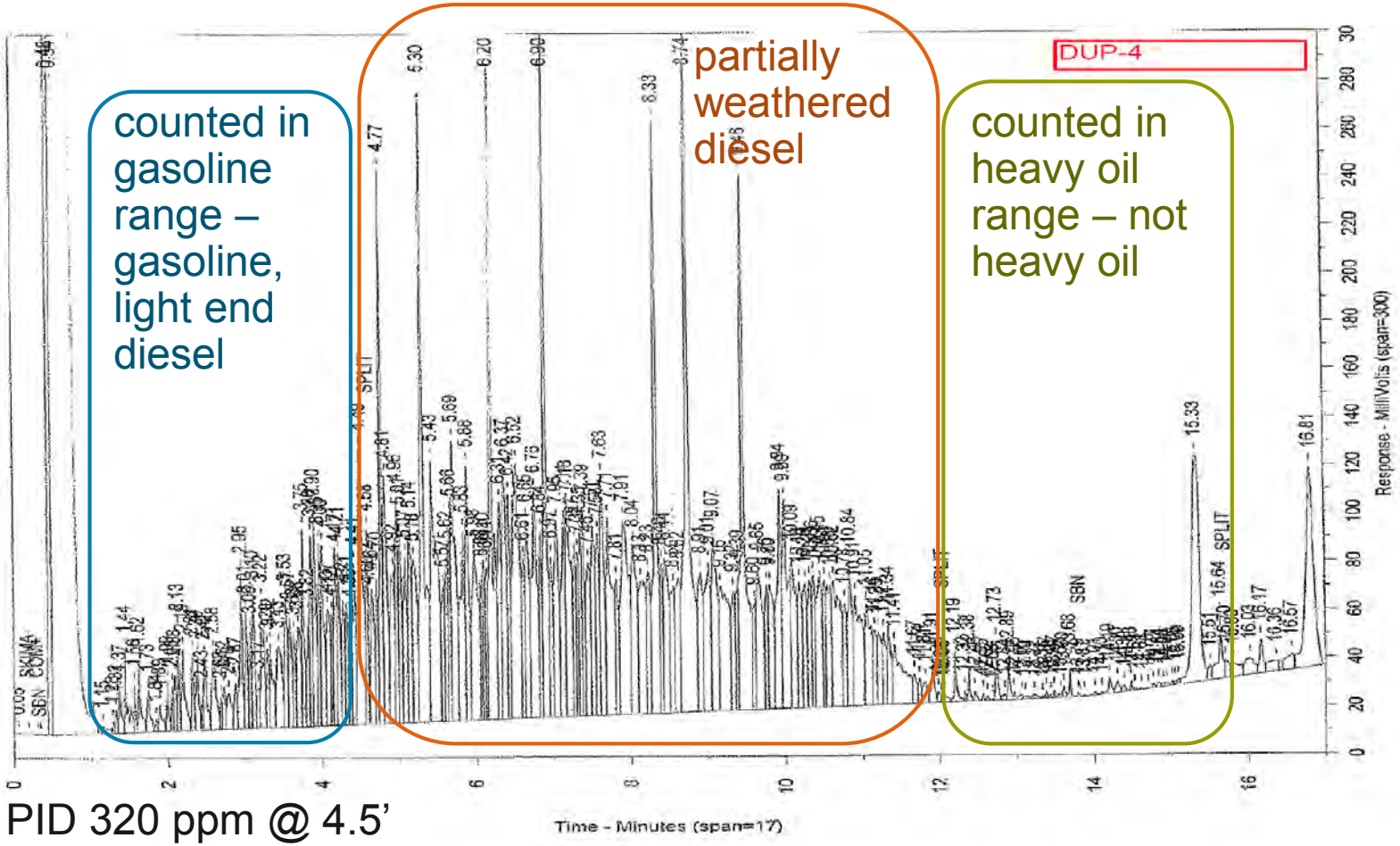
GRO	1200 mg/kg
DRO	3800 mg/kg
HRO	170 mg/kg



PID 170 ppm

Soil Sample Chromatogram

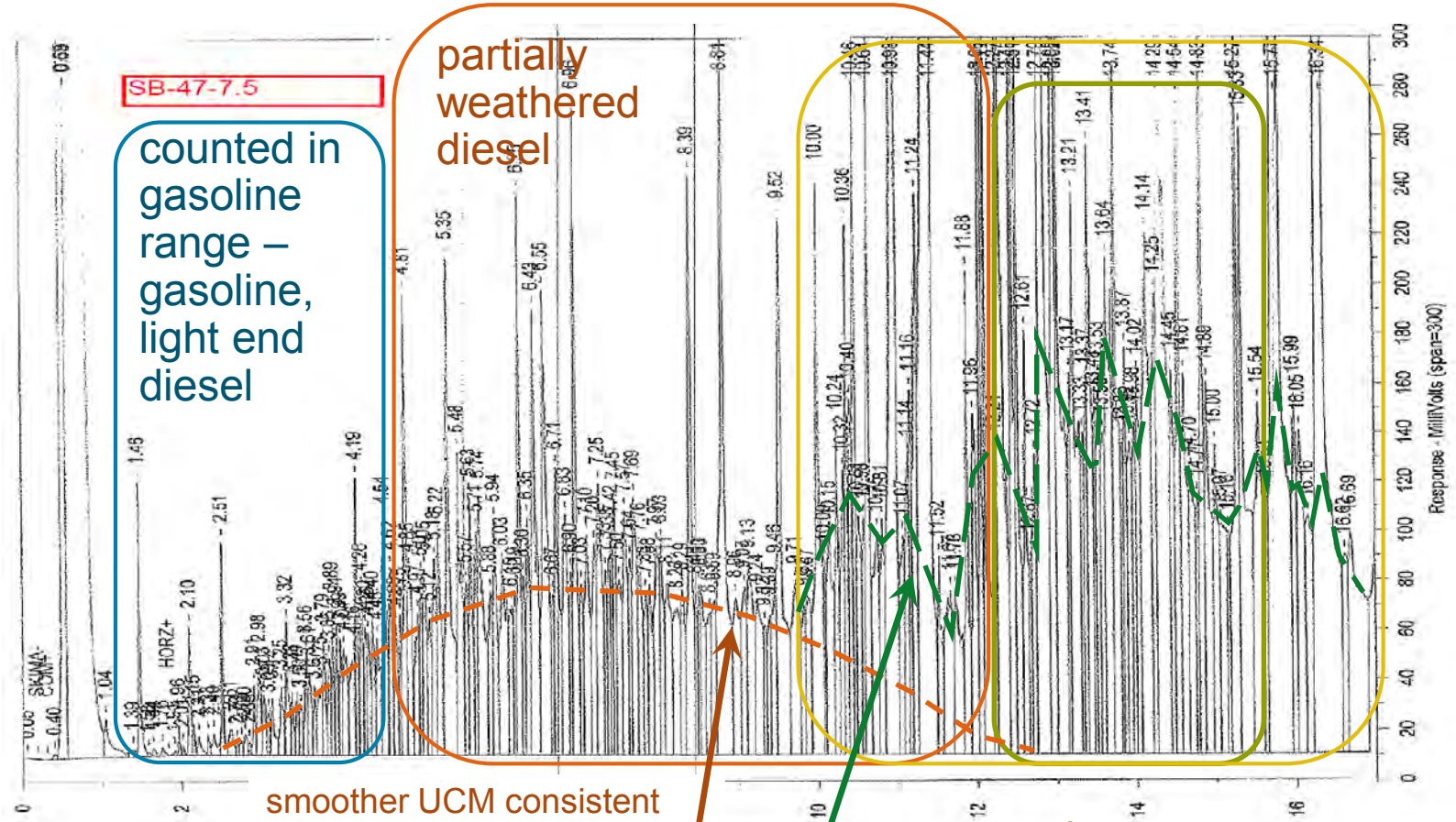
GRO	990 mg/kg
DRO	1900 mg/kg
HRO	<98 mg/kg



PID 320 ppm @ 4.5’

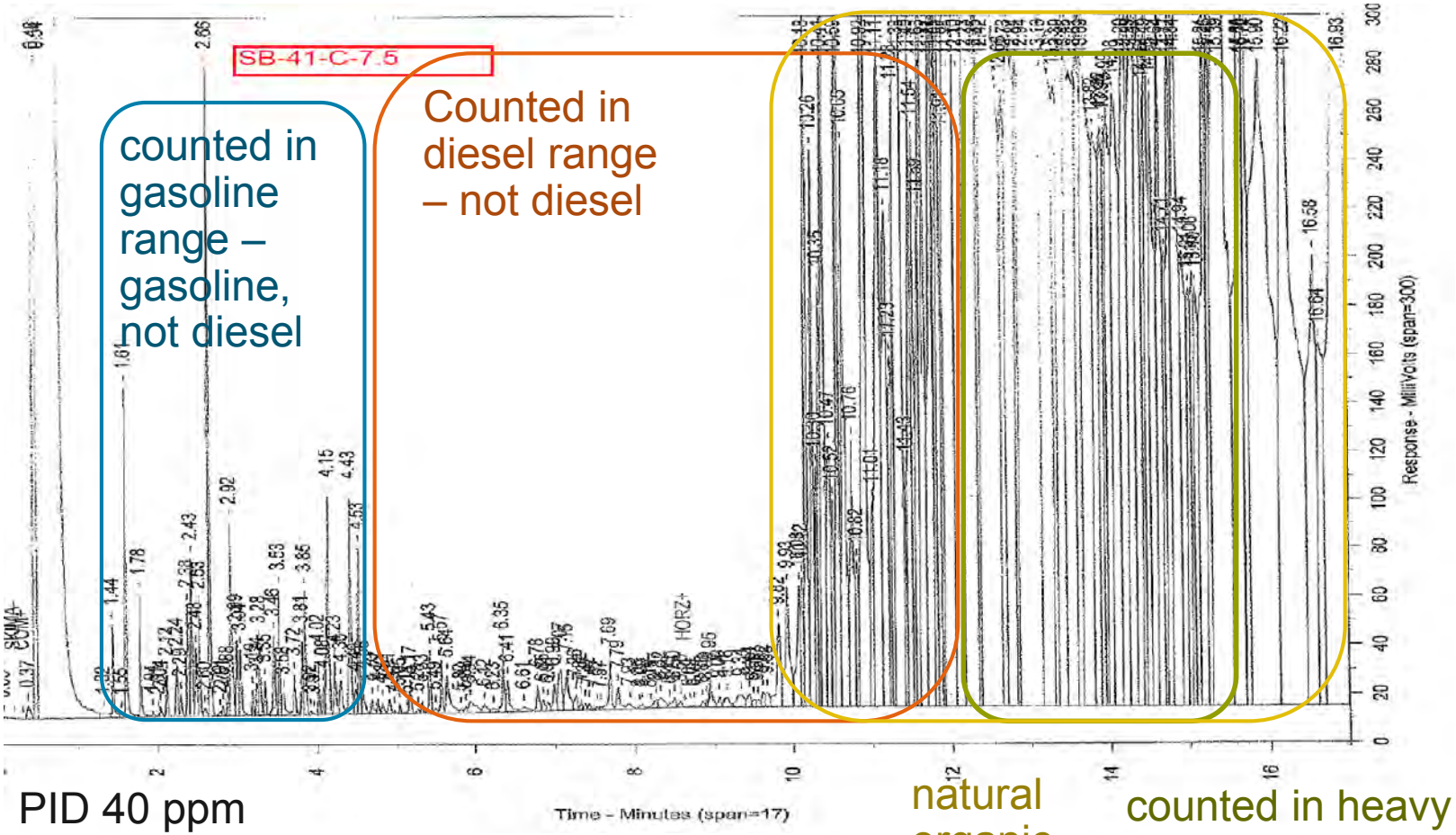
Soil Sample Chromatogram

GRO	420 mg/kg
DRO	1500 mg/kg
HRO	1000 mg/kg



Soil Sample Chromatogram

GRO	<570 mg/kg
DRO	4400 mg/kg
HRO	8200mg/kg



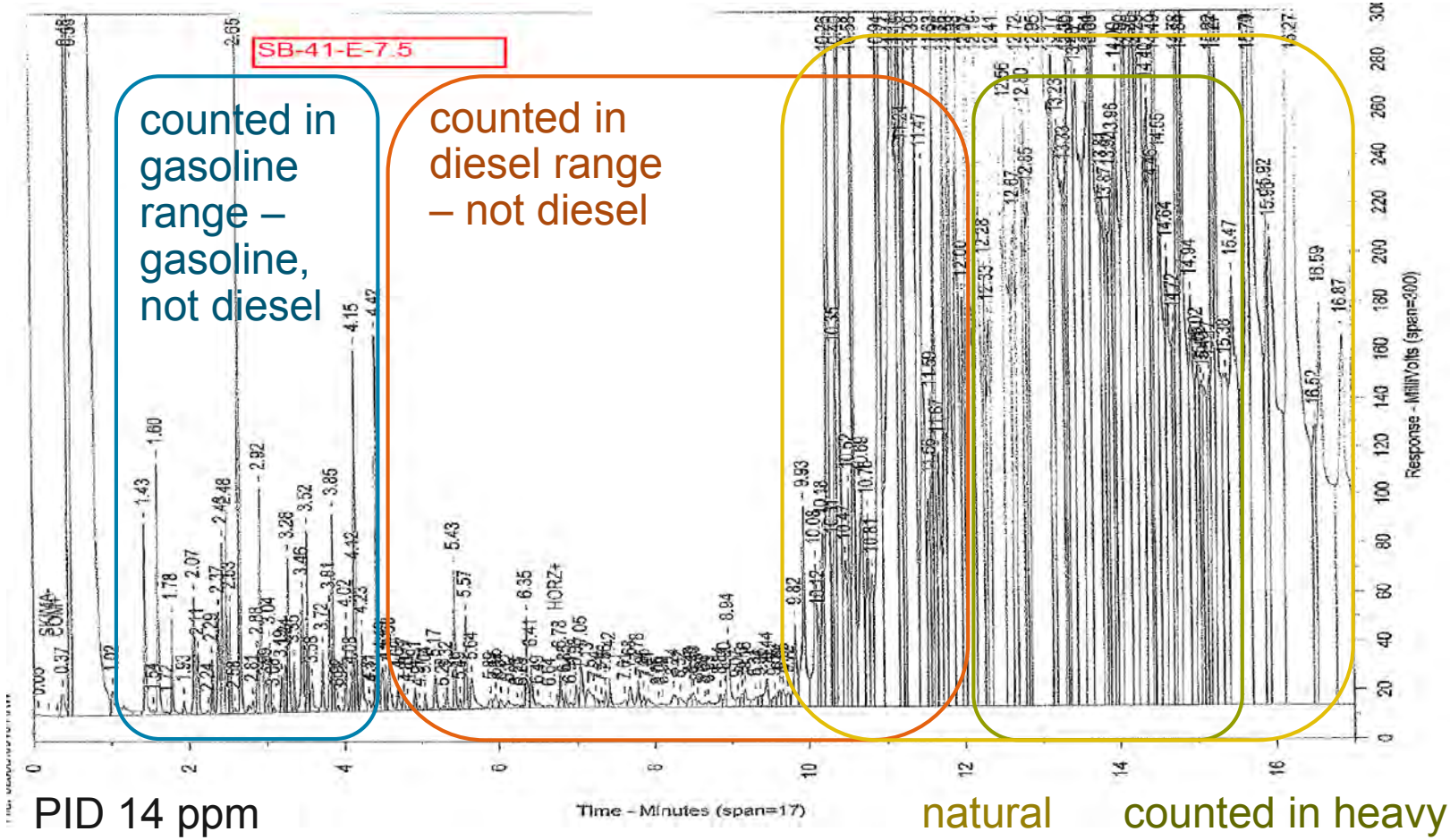
PID 40 ppm

natural organic matter

counted in heavy oil range – not heavy oil

Soil Sample Chromatogram

GRO	390J mg/kg
DRO	1400 mg/kg
HRO	2300 mg/kg



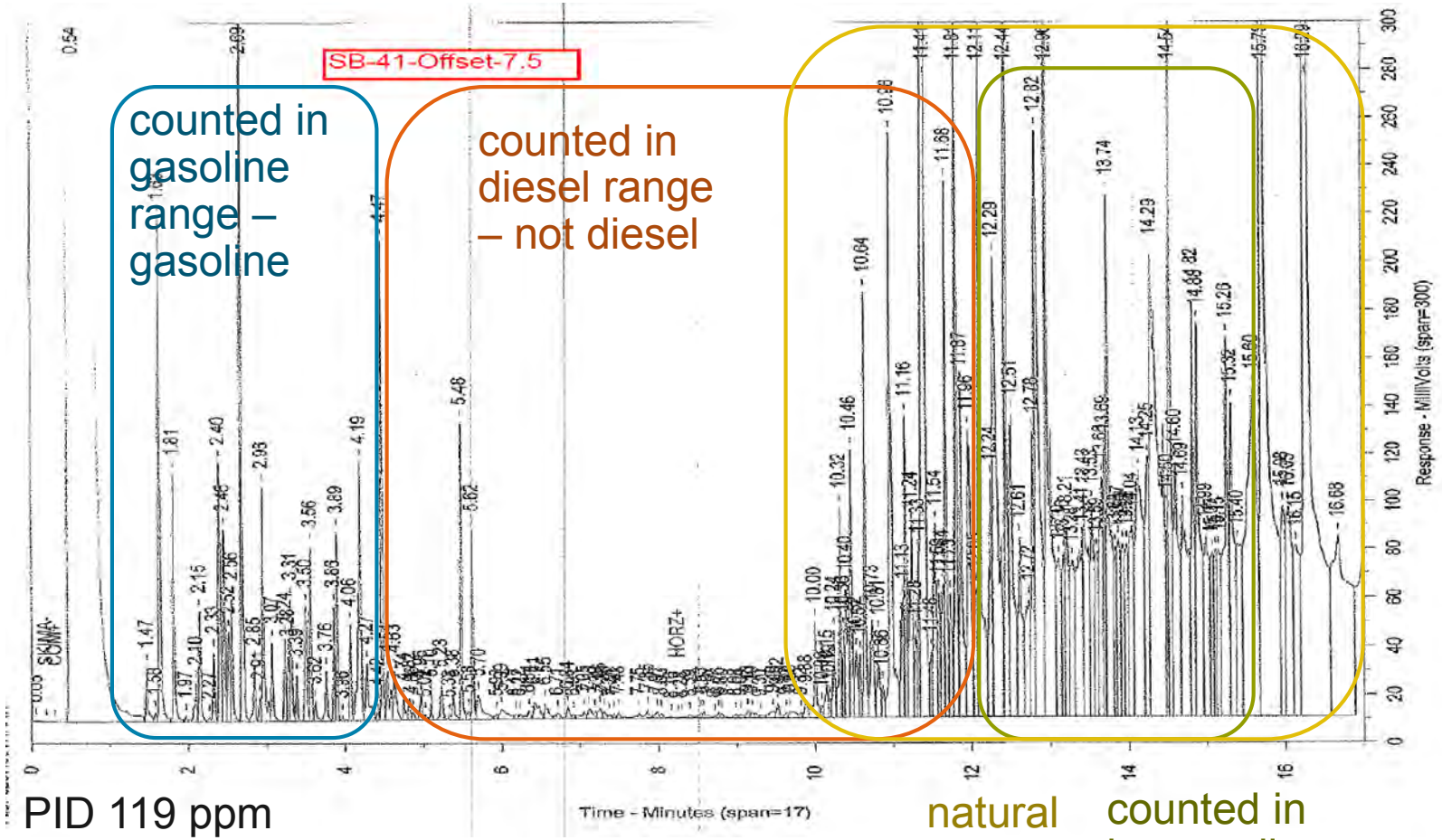
PID 14 ppm

natural organic matter

counted in heavy oil range – not heavy oil

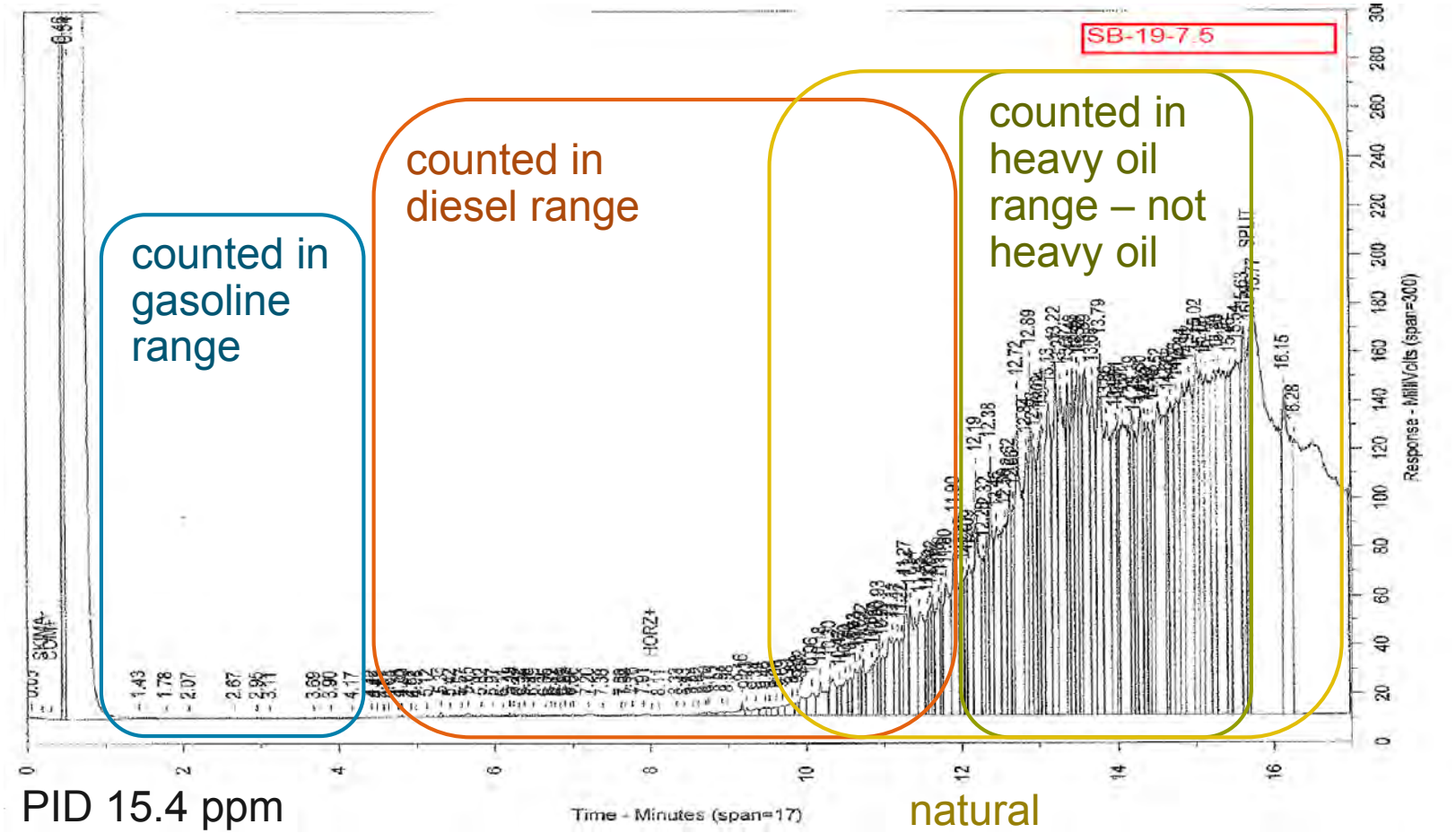
Soil Sample Chromatogram

GRO	1700 mg/kg
DRO	1200 mg/kg
HRO	2400 mg/kg



Soil Sample Chromatogram

GRO	<58 mg/kg
DRO	9600J mg/kg
HRO	44000J mg/kg

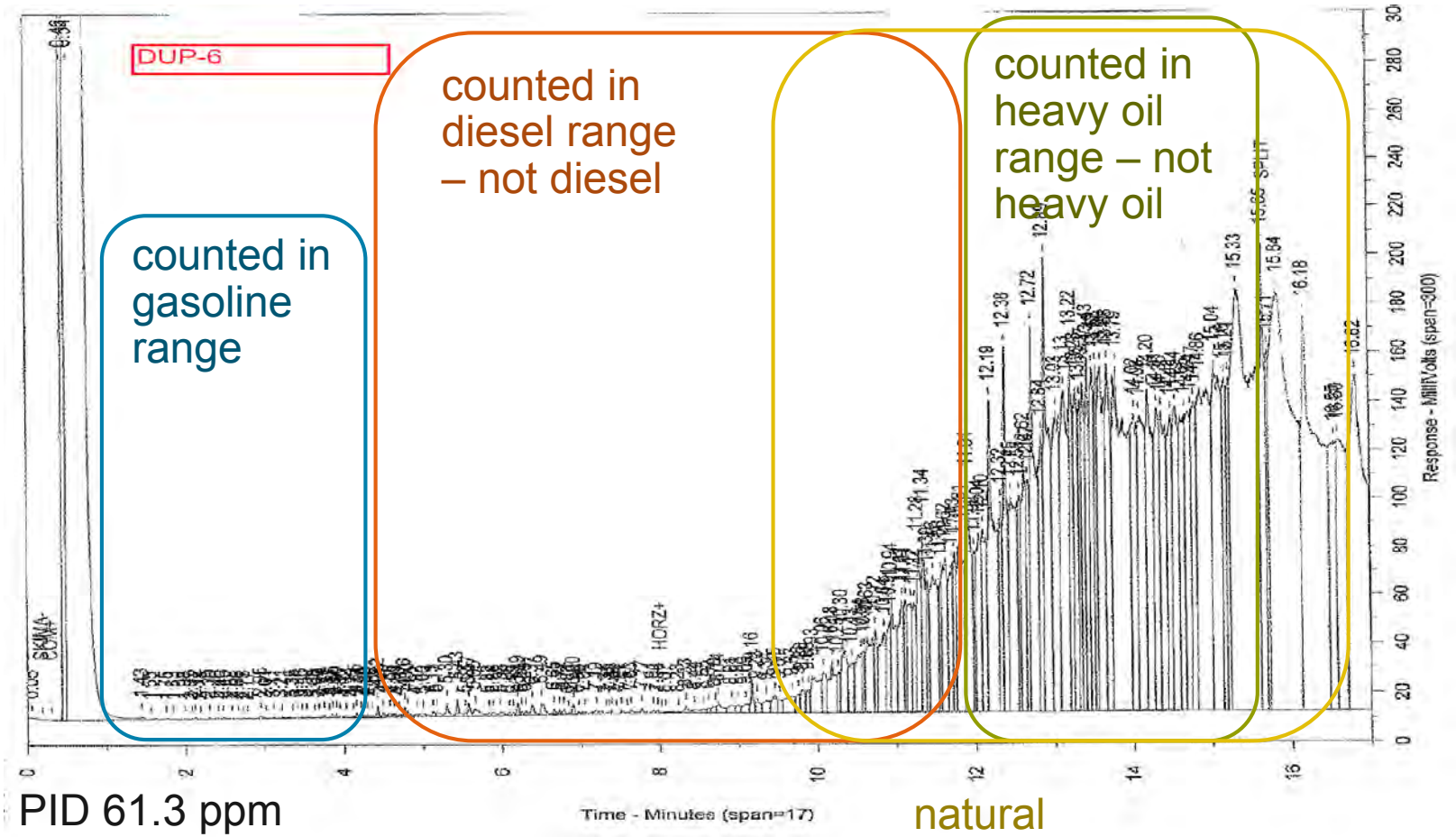


PID 15.4 ppm

natural organic matter

Soil Sample Chromatogram

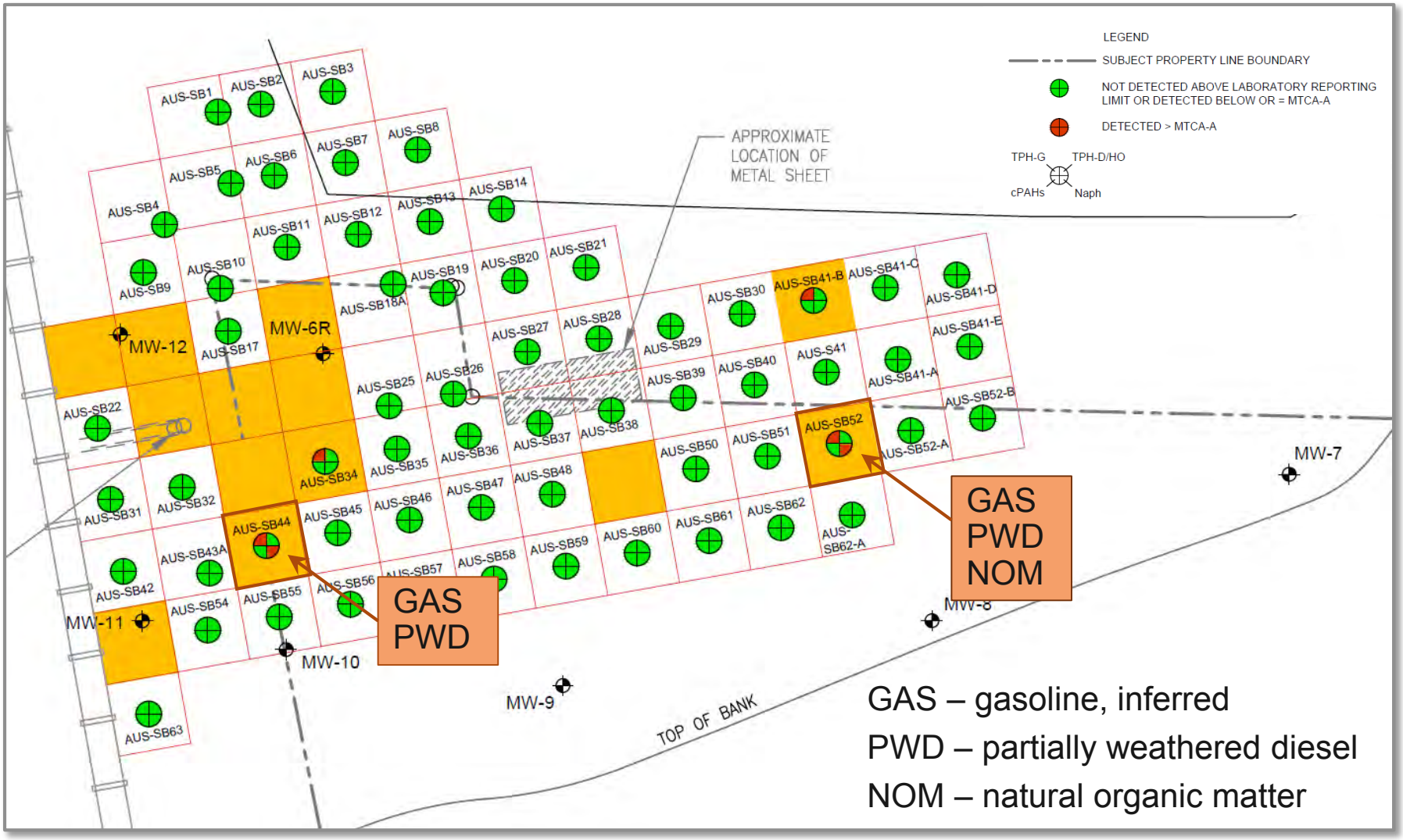
GRO	1100 mg/kg
DRO	8900J mg/kg
HRO	44000J mg/kg



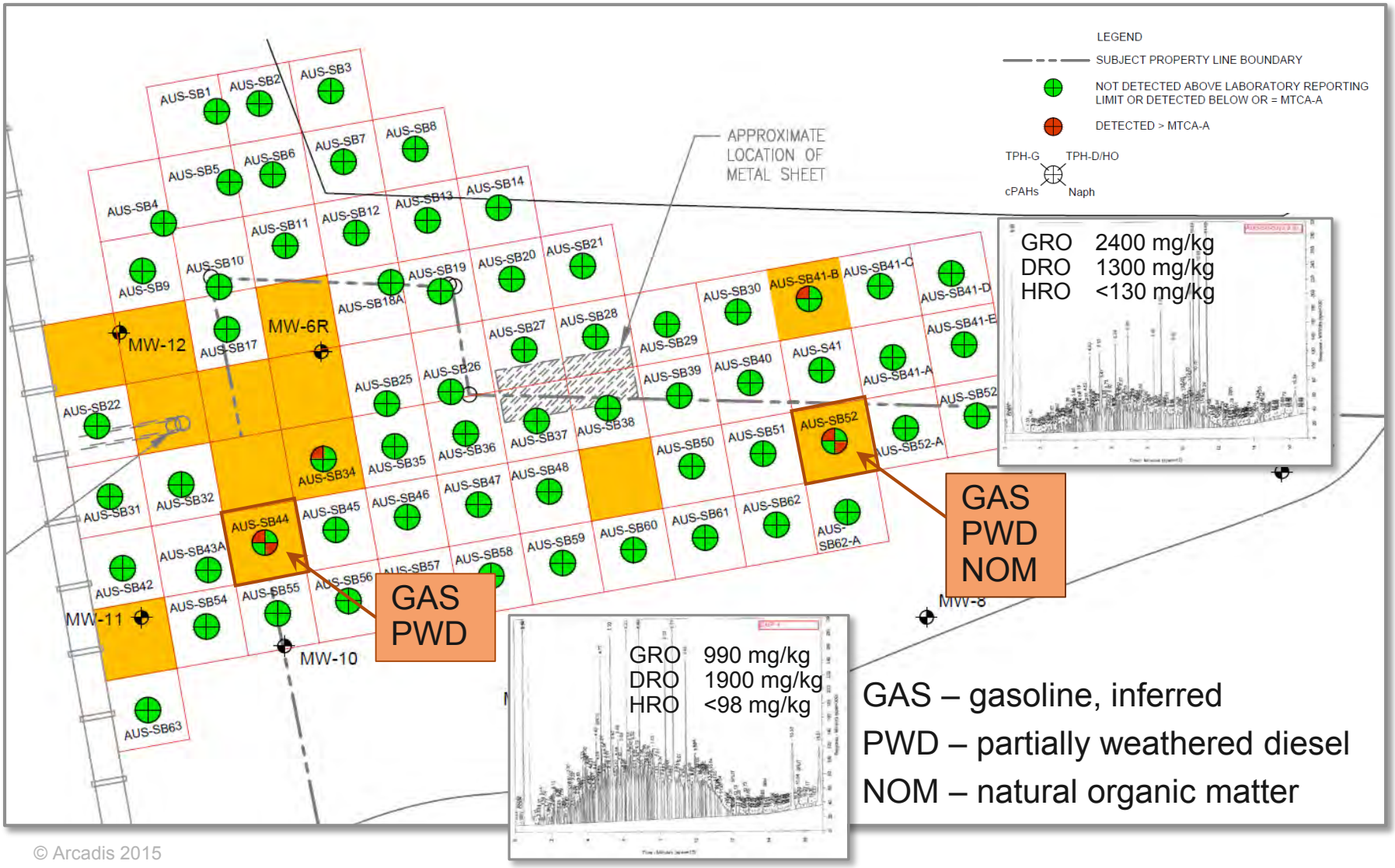
PID 61.3 ppm

natural organic matter

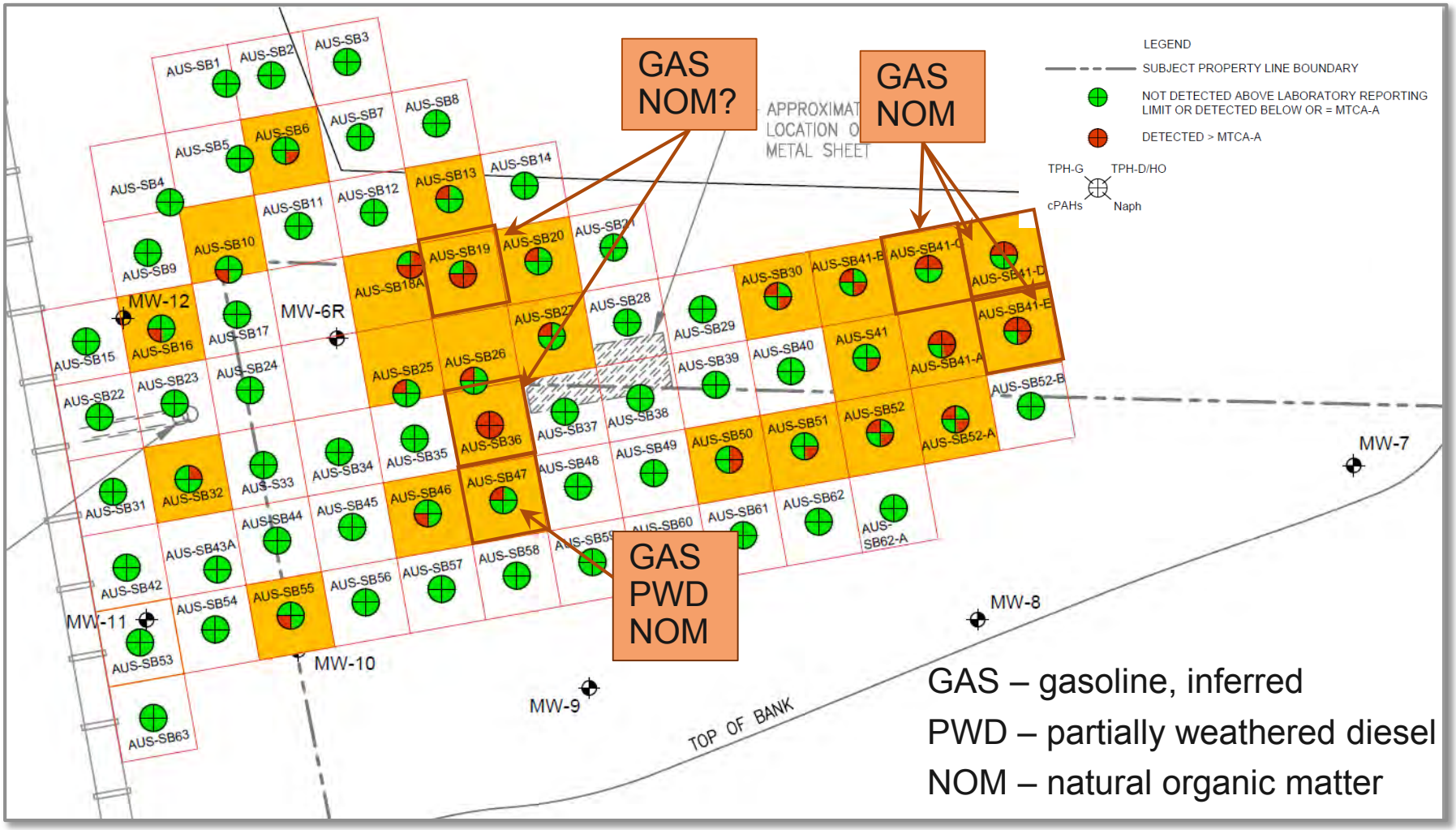
Shallow Depth Interval



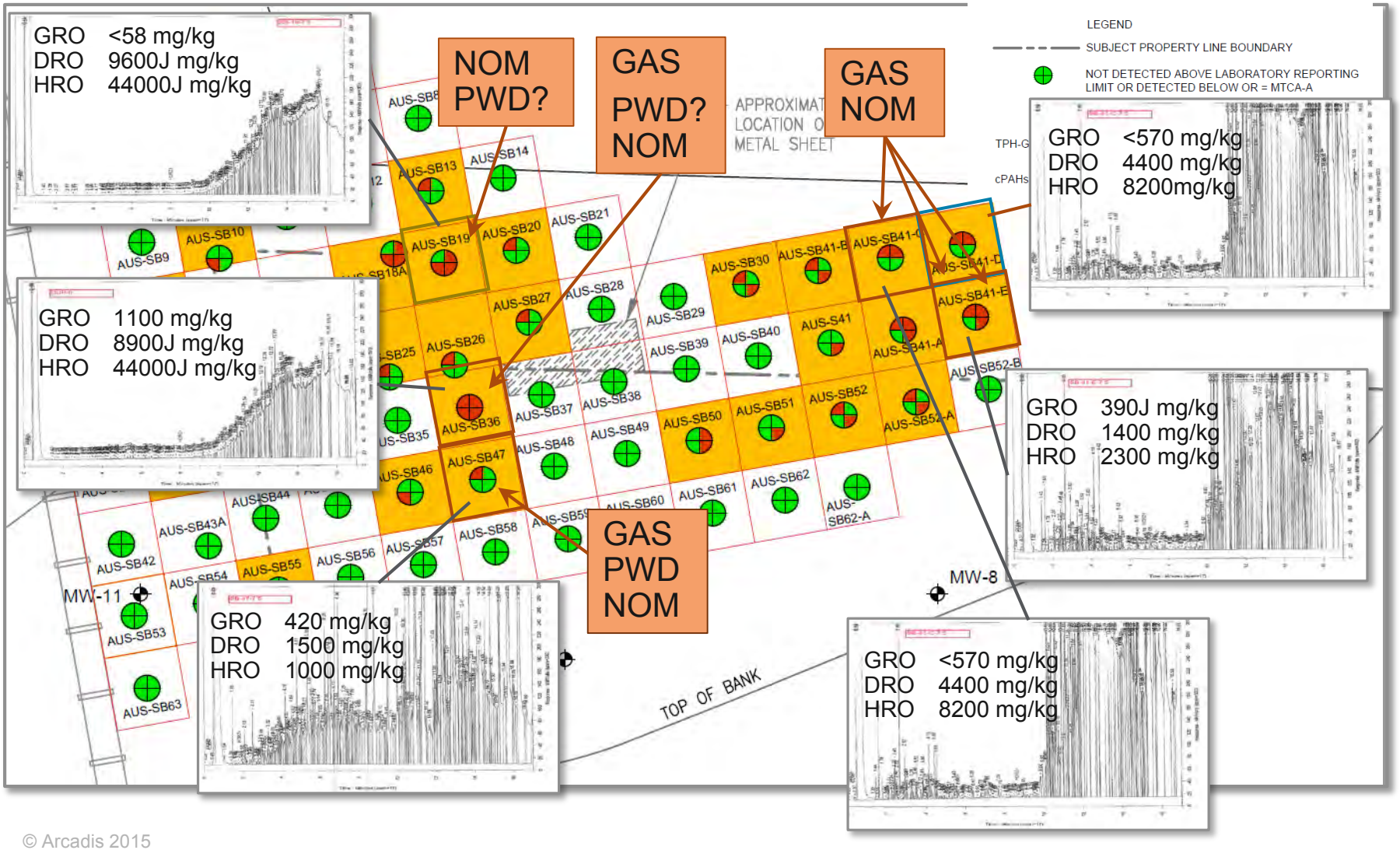
Shallow Depth Interval



Middle Depth Interval



Middle Depth Interval



APPENDIX D

Pre-Excavation Groundwater Monitoring Report

Mr. Steve Teel
Washington State Department of Ecology
Central Regional Office
15 West Yakima Avenue, Suite 200
Yakima, WA 98902

Arcadis U.S., Inc.
1100 Olive Way
Suite 800
Seattle
Washington 98101
Tel 205 325 5254
Fax 206 325 8218
www.arcadis.com

Subject:
2015 Pre-Excavation Groundwater Monitoring Report, former ARCO Olympia Bulk Terminal, Lowland Portion of the Former Industrial Petroleum Distributors Site (Agreed Order No. DE 10470), 1120 West Bay Drive Olympia, Washington

ENVIRONMENT

Date:
January 4, 2016

Contact:
Brian Marcum

Phone:
503-220-8201 x1137

Email:
Brian.Marcum@arcadis.com

Our ref:
GP09BPNA.WA60

Dear Mr. Teel,

Arcadis U.S. Inc. (Arcadis), on behalf of BP West Coast Products, LLC, has prepared this 2015 *Pre-Excavation Groundwater Monitoring Report*, for lowland portion of the former Industrial Petroleum Distributors Site located at 1120 West Bay Drive in Olympia, Washington (the "Site"). The Site is currently a vacant lot. A Site location map is presented on Figure 1 and a site aerial photo is presented on Figure 2**.**

Groundwater Monitoring

On September 2nd, 2015, Arcadis conducted groundwater monitoring activities at the Site. During the event, monitoring wells MW-6R and MW-7 through MW-12 were gauged using a water level meter and sampled using low flow sampling procedures. The depth to groundwater during this sampling event ranged between 1.92 feet below top of casing (btoc) in monitoring well MW-6R to 5.60 feet btoc in monitoring well MW-7. Groundwater elevations during this sampling event ranged from 8.94 feet above the North American Vertical Datum of 1988 (NAVD 88) in monitoring well MW-7 to 13.42 feet above NAVD 88 in monitoring well MW-12. Groundwater gauging data are presented in Table 1 and Groundwater elevation contours are presented on Figure 3. Field data sheets are included as Attachment A.

Following gauging, wells were low-flow purged using a peristaltic pump and dedicated disposable tubing and field parameters including pH, temperature, electrical conductivity, turbidity, dissolved oxygen, and oxidation-reduction potential were collected with multi-parameter water quality meter and flow-through cell. Field parameters were allowed to stabilize according to Arcadis' standard operating procedure for low-flow groundwater sampling prior to collecting samples. Samples were then collected in laboratory-provided bottles, placed in a cooler with ice, and submitted to Eurofins Lancaster Laboratories in Lancaster, Pennsylvania, under standard chain-of-custody protocol. Samples were analyzed for the following constituents of concern (COCs):

- Total petroleum hydrocarbon-gasoline range organics (GRO) by Northwest Total Petroleum Hydrocarbon (NWTPH)-Gx
- Total petroleum hydrocarbon-diesel range organics (DRO) and total petroleum hydrocarbons-heavy oil range organics (HO) by NWTPH-Dx
- Benzene, toluene, ethlyblezene, total xylenes (BTEX, collectively), methyl tertiary butyl ether (MTBE), 1,2-dibromoethane (EDB) and 1,2-dichloroethane (EDC) by United States Environmental Protection Agency (USEPA) Method 8260B
- Carcinogenic polycyclic aromatic hydrocarbons (cPAHs) and total napthalenes by USEPA Method 8270C SIM
- Total and dissolved lead by USEPA Method 6020

The laboratory analytical report and chain-of-custody documentation from the monitoring event are included as Attachment B. Analytical results are summarized in Table 1, Table 2, and on Figure 3.

The depth to groundwater at the Site ranged from 1.92 feet btoc in monitoring well MW-6R to 5.60 btoc in monitoring well MW-7. The groundwater elevations at the Site ranged from 8.94 feet above NAVD 88 in monitoring well MW-7 to 13.42 feet above NAVD 88 in monitoring well MW-12.

Monitoring well MW-6R and MW-7 through MW-12 were sampled, and a duplicate groundwater sample was collected from MW-7. Groundwater samples collected indicated that the following COCs were detected at concentrations which exceed their respective Model Toxic Control Act (MTCA) Method A Clean up Levels (CULs) contained concentrations of constituents of concern (COCs):

- DRO in the groundwater sample collected from monitoring well MW-8, at a concentration of 670 µg/L.

- HO in the groundwater sample collected from MW-8 at a concentration of 1,000 µg/L.

This is the first exceedance of MTCA Method A CULs detected in groundwater at the Site. Groundwater will continue to be monitored in accordance with the Washington State Department of Ecology (Ecology) Cleanup Action Plan (CAP; Ecology 2014), Agreed Order (AO) No. DE 10470, and the Pre-Excavation Soil Sampling and Excavation Work Plan (WP; Arcadis 2015).

COC concentrations in remaining samples were either not detected above the laboratory method detection limit or were detected at concentrations which did not exceed MTCA Method A CULs.

The next groundwater monitoring event at the Site is scheduled to occur following the completion of remedial excavation activities, which are expected to occur summer of 2016. Should you have any questions, or if Arcadis can be of further assistance, please contact Brian Marcum at 503-220-8201 x1137.

Sincerely,

Arcadis U.S., Inc.

Brian Marcum, EIT Project Manager	Rebecca Andresen, LG Associate Vice President

Copies:
Mr. Bob May, Disclaimer Trust of John J. O'Connell
Ms. Alex Smith, Port of Olympia
Mr. Tom Morrill, City of Olympia
Mr. Steve Wise, City of Olympia Public Works Department
Mr. Bruce A. Sheppard, BNSF Railway Company

Attachments:

Figure 1	Site Location Map
Figure 2	Site Aerial Photo
Figure 3	Groundwater Elevations with Analytical Results - September 2, 2015
Table 1	Groundwater Gauging Data and Select Analytical Results
Table 2	Groundwater Analytical Results for cPAHs and Napthalenes
Attachment A	Groundwater Monitoring Field Data Sheets
Attachment B	Laboratory Report and Chain-of-Custody Documentation

References:

Arcadis U.S., Inc. 2015. Pre-excavation Soil Sampling and Excavation Work Plan, Former ARCO Olympia Bulk Terminal, Industrial Petroleum Distributors Site (Facility Identification No. 1436), 1120 West Bay Drive, Olympia, Washington. June 2.

Washington State Department of Ecology, 2014. Cleanup Action Plan, Industrial Petroleum Distributors. October.

Washington State Department of Ecology, 2014. Agreed Order No. DE 10470. October 24.

REFERENCE: BASE MAP USGS 7.5. MIN. TOPO. QUAD., TUMWATER, WASHINGTON, 2014

0 2500' 5000'

Approximate Scale: 1 in. = 2500 ft.

BP WEST COAST PRODUCTS LLC
FORMER INDUSTRIAL PETROLEUM DISTRIBUTORS
BULK TERMINAL, 1120 WEST BAY DRIVE, OLYMPIA, WA
2015 PRE-EXCAVATION GROUNDWATER MONITORING REPORT

SITE LOCATION MAP

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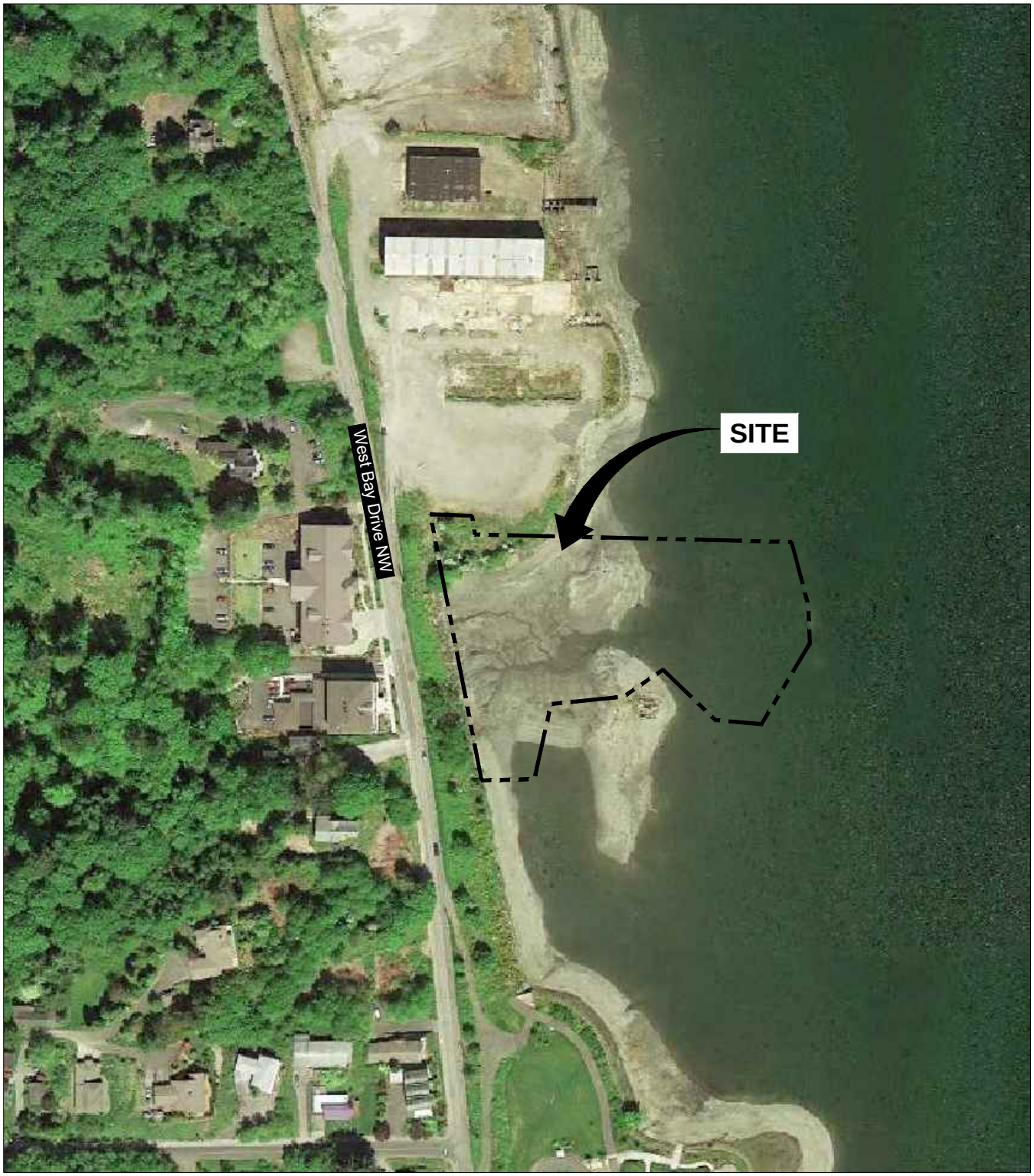
FIGURE 1

CITY:(Reqd) DIV/GROUP:(Reqd) DB:(Reqd) LD:(Opt) PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
G:\ENVCAD\Emeryville\ACT\GP09BPNAWA60\N00000\2015 GWMR-PreExc\DWG\GP09BPNAWA60-N01.dwg LAYOUT: 1 SAVED: 12/23/2015 11:51 AM ACADVER: 19.1S (LMS TECH) PAGESETUP: --- PLOTSTYLETABLE: ARCADIS.CTB PLOTTED: 12/23/2015 3:44 PM BY: REYES, ALEC
XREFS: IMAGES: PROJECTNAME: ---
TOPO 2014 BulkTerminal OlympiaWA.jpg



SOURCE: GOOGLE EARTH

0 200' 400'

Approximate Scale: 1 in. = 200 ft.

BP WEST COAST PRODUCTS LLC
FORMER INDUSTRIAL PETROLEUM DISTRIBUTORS
BULK TERMINAL, 1120 WEST BAY DRIVE, OLYMPIA, WA
2015 PRE-EXCAVATION GROUNDWATER MONITORING REPORT

SITE AERIAL PHOTO

ARCADIS Design & Consultancy for natural and built assets

FIGURE
2

LEGEND

- SUBJECT PROPERTY LINE BOUNDARY
- MW-7 — GROUNDWATER MONITORING WELL LOCATION
- 12.0 — GROUNDWATER ELEVATION CONTOUR (FEET ABOVE MEAN SEA LEVEL), DASHED WHERE INFERRED
- (13.22) — GROUNDWATER ELEVATION (FEET ABOVE MEAN SEA LEVEL)
- 0.055 FT/FT — GROUNDWATER FLOW DIRECTION AT CALCULATED HYDRAULIC GRADIENT OF 0.055 FT/FT

MW-7	
GRO	<50
DRO	130
HO	<100
B	<0.50
T	<0.50
E	<0.50
X	<0.50
MTBE	<0.50
EDB	<0.0096
EDC	<0.50
Pb-T	<0.13
Pb-D	<0.13

WELL IDENTIFICATION
TOTAL PETROLEUM HYDROCARBONS - GASOLINE RANGE ORGANICS (µg/L)
TOTAL PETROLEUM HYDROCARBONS - DIESEL RANGE ORGANICS (µg/L)
TOTAL PETROLEUM HYDROCARBONS - HEAVY OIL RANGE ORGANICS (µg/L)
BENZENE (µg/L)
TOLUENE (µg/L)
ETHYL BENZENE (µg/L)
TOTAL XYLENES (µg/L)
METHYL TERTIARY BUTYL ETHER (µg/L)
ETHYLENE DIBROMIDE
1,2 - DICHLOROETHANE (µg/L)
TOTAL LEAD
DISSOLVED LEAD

NOTES:
1. ALL CONCENTRATIONS ARE PRESENTED IN MICROGRAMS PER LITER (µg/L)
2. *MW-6 WAS REPLACED BY MW-6R ON AUGUST 23, 2010.
3. **BOLD** ANALYTE DETECTED ABOVE MODEL TOXIC CONTROL ACT (MTCA) METHOD A CLEANUP LEVELS

MW-6R	
GRO	<50
DRO	<46
HO	<100
B	<0.50
T	<0.50
E	<0.50
X	<0.50
MTBE	<0.50
EDB	<0.0094
EDC	<0.50
Pb-T	0.72
Pb-D	<0.13

MW-12	
GRO	<50
DRO	<48
HO	<110
B	<0.50
T	<0.50
E	<0.50
X	<0.50
MTBE	<0.50
EDB	<0.0096
EDC	<0.50
Pb-T	<0.13
Pb-D	<0.13

MW-11	
GRO	<50
DRO	<48
HO	<110
B	<0.50
T	<0.50
E	<0.50
X	<0.50
MTBE	<0.50
EDB	<0.0096
EDC	<0.50
Pb-T	0.87
Pb-D	<0.13

MW-10	
GRO	<50
DRO	<45
HO	<100
B	<0.50
T	<0.50
E	<0.50
X	<0.50
MTBE	<0.50
EDB	<0.0094
EDC	<0.50
Pb-T	2.1
Pb-D	0.15

MW-9	
GRO	67
DRO	<45
HO	<100
B	<0.50
T	<0.50
E	<0.50
X	<0.50
MTBE	<0.50
EDB	<0.0096
EDC	<0.50
Pb-T	0.30
Pb-D	<0.13

MW-8	
GRO	<50
DRO	670
HO	1,000
B	<0.50
T	<0.50
E	<0.50
X	<0.50
MTBE	<0.50
EDB	<0.0095
EDC	<0.50
Pb-T	<0.13
Pb-D	<0.13

MW-7	
GRO	<50
DRO	130
HO	<100
B	<0.50
T	<0.50
E	<0.50
X	<0.50
MTBE	<0.50
EDB	<0.0096
EDC	<0.50
Pb-T	<0.13
Pb-D	<0.13

PIPING ELBOWS EMERGING FROM UNDERGROUND
GATE
MW-12 (13.42)
MW-6R (12.42)
MW-6*
MW-11 (13.33)
MW-10 (11.13)
MW-9 (10.17)
MW-8 (9.02)
MW-7 (8.94)
0.055 FT/FT
13.0
12.0
11.0
10.0
9.0
TOP OF BANK
WEST BAY DRIVE
RAIL ROAD
ABANDONED PIER

0 35' 70'
Approximate Scale: 1 in. = 35 ft.

THIS MAP PREPARED FROM A FIELD SURVEY BY OTAK ON OCTOBER 7, 2010

BP WEST COAST PRODUCTS LLC
FORMER INDUSTRIAL PETROLEUM DISTRIBUTORS
BULK TERMINAL, 1120 WEST BAY DRIVE, OLYMPIA, WA
2015 PRE-EXCAVATION GROUNDWATER MONITORING REPORT

GROUNDWATER ELEVATION CONTOUR AND ANALYTICAL SUMMARY MAP SEPTEMBER 2, 2015

ARCADIS Design & Consultancy for natural and built assets

FIGURE 3

Table 1
Groundwater Gauging Data and Select Analytical Results
WA-OLYMP

1120 West Bay Drive, Olympia, WA

All analytical results are presented in micrograms per liter (µg/L)

Well	Date	Notes	TOC	DTW	NAPL	GWE	GRO	DRO	HO	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE	EDB	EDC	Total Lead	Dissolved Lead
Model Toxics Control Act (MTCA) Method A Cleanup Levels (CULs) in µg/L							**800/1,000**	**500**	**500**	**5**	**1,000**	**700**	**1,000**	**20**	**0.01**	**5**	**15**	**15**
MW-6R	10/1/2010	(LFP)	14.34	2.42	0.0	11.92	<50	<120	<240	<1.0	<1.0	<1.0	<2.0	--	--	--	<2.0(^)	<2.0(^)
MW-6R	12/29/2010		14.34	2.00	0.0	12.34	--	--	--	--	--	--	--	--	--	--	--	--
MW-6R	12/30/2010	(LFP)	14.34	--	--	--	<50.0	<76	<380	<0.20	<1.0	<1.0	<3.0	--	--	--	<10.0	<10.0
MW-6R	12/30/2010	(Dup)(LFP)	14.34	--	--	--	<50.0	<76	<380	<0.20	<1.0	<1.0	<3.0	--	--	--	<10.0	<10.0
MW-6R	3/17/2011	(LFP)	14.34	1.80	0.0	12.54	<50	<120	<240(^)	<1.0	<1.0	<1.0	<2.0	--	--	--	5.4	<2.0
MW-6R	4/19/2011		14.34	1.96	0.0	12.38	--	--	--	--	--	--	--	--	--	--	--	--
MW-6R	6/11/2011	(LFP)	14.34	2.02	0.0	12.32	<50.0	<85	<430	<0.20	<1.0	<1.0	<3.0	--	--	--	<10.0	<10.0
MW-6R	9/22/2011	(LFP)	14.34	2.35	0.0	11.99	<50.0	<75	<380	<0.20	<1.0	<1.0	<3.0	<1.0	--	--	<10.0	<10.0
MW-6R	12/22/2011	(LFP)	14.34	2.24	0.0	12.10	<50.0	<91	<450	<0.20	<1.0	<1.0	<3.0	--	--	--	<10.0	<10.0
MW-6R	12/22/2011	(Dup)(LFP)	14.34	2.24	0.0	12.10	<50.0	<84	<420	<0.20	<1.0	<1.0	<3.0	--	--	--	<10.0	<10.0
MW-6R	9/2/2015	(LFP)	14.34	1.92	0.0	12.42	<50	<46	<100	<0.50	<0.50	<0.50	<0.50	<0.50	<0.0094	<0.50	0.72(J)	<0.13
MW-7	10/1/2010	(LFP)	14.54	4.80	0.0	9.74	<50	150(Y)	<250	<1.0	<1.0	<1.0	<2.0	--	--	--	<2.0(^)	<2.0(^)
MW-7	12/29/2010	(LFP)	14.54	2.21	0.0	12.33	<50.0	<77	<380	<0.20	<1.0	<1.0	<3.0	--	--	--	<10.0	<10.0
MW-7	3/17/2011	(LFP)	14.54	2.24	0.0	12.30	<50	<120	<240(^)	<1.0	<1.0	<1.0	<2.0	--	--	--	<2.0	<2.0
MW-7	4/19/2011		14.54	3.61	0.0	10.93	--	--	--	--	--	--	--	--	--	--	--	--
MW-7	6/11/2011	(LFP)	14.54	5.07	0.0	9.47	<50.0	<87	<430	<0.20	<1.0	<1.0	<3.0	--	--	--	<10.0	<10.0
MW-7	6/11/2011	(Dup)(LFP)	14.54	5.07	0.0	9.47	<50.0	<86	<430	<0.20	<1.0	<1.0	<3.0	--	--	--	<10.0	<10.0
MW-7	9/22/2011	(LFP)	14.54	7.21	0.0	7.33	<50.0	<75	<380	<0.20	<1.0	<1.0	<3.0	<1.0	--	--	<10.0	<10.0
MW-7	12/22/2011	(LFP)	14.54	4.79	0.0	9.75	<50.0	<75	<380	<0.20	<1.0	<1.0	<3.0	--	--	--	<10.0	<10.0
MW-7	9/2/2015	(LFP)	14.54	5.60	0.0	8.94	<50	130	<100	<0.50	<0.50	<0.50	<0.50	<0.50	<0.0096	<0.50	<0.13	<0.13
MW-7	9/2/2015	(Dup)	14.54	5.60	0.0	8.94	<50	110	<100	<0.50	<0.50	<0.50	<0.50	<0.50	<0.0094	<0.50	<0.13	<0.13
MW-8	10/1/2010	(LFP)	13.98	3.93	0.0	10.05	<50	200(Y)	<240	<1.0	<1.0	<1.0	<2.0	--	--	--	<2.0(^)	<2.0(^)
MW-8	12/29/2010	(LFP)	13.98	2.25	0.0	11.73	<50.0	<77	<380	0.21	<1.0	<1.0	<3.0	--	--	--	<10.0	<10.0
MW-8	3/17/2011	(LFP)	13.98	2.19	0.0	11.79	<50	<120	<240(^)	<1.0	<1.0	<1.0	<2.0	--	--	--	<2.0	<2.0
MW-8	3/17/2011	(Dup)(LFP)	13.98	2.19	0.0	11.79	<50	<120	<240(^)	<1.0	<1.0	<1.0	<2.0	--	--	--	<2.0	<2.0
MW-8	4/19/2011		13.98	2.68	0.0	11.30	--	--	--	--	--	--	--	--	--	--	--	--
MW-8	6/11/2011	(LFP)	13.98	3.85	0.0	10.13	<50.0	<83	<420	0.26	<1.0	<1.0	<3.0	--	--	--	<10.0	<10.0
MW-8	9/22/2011	(LFP)	13.98	6.43	0.0	7.55	<50.0	<75	<380	0.35	<1.0	<1.0	<3.0	<1.0	--	--	<10.0	<10.0
MW-8	12/22/2011	(LFP)	13.98	3.89	0.0	10.09	<50.0	<87	<430	0.23	<1.0	<1.0	<3.0	--	--	--	<10.0	<10.0
MW-8	9/2/2015	(LFP)	13.98	4.96	0.0	9.29	<50	**670**	**1,000**	<0.50	<0.50	<0.50	<0.50	<0.50	<0.0095	<0.50	<0.13	<0.13
MW-9	10/1/2010	(LFP)	14.62	3.21	0.0	11.41	110	160(Y)	<250	<1.0	<1.0	<1.0	<2.0	--	--	--	<2.0(^)	<2.0(^)
MW-9	12/29/2010	(LFP)	14.62	2.50	0.0	12.12	56.5	<76	<380	0.21	<1.0	<1.0	<3.0	--	--	--	<10.0	<10.0
MW-9	3/17/2011	(LFP)	14.62	2.28	0.0	12.34	<50	<120	<240(^)	<1.0	<1.0	<1.0	<2.0	--	--	--	<2.0	<2.0
MW-9	4/19/2011		14.62	3.21	0.0	11.41	--	--	--	--	--	--	--	--	--	--	--	--
MW-9	6/11/2011	(LFP)	14.62	3.78	0.0	10.84	84.4	<88	<440	<0.20	<1.0	<1.0	<3.0	--	--	--	<10.0	<10.0
MW-9	9/22/2011	(LFP)	14.62	3.81	0.0	10.81	241	<75	<380	0.37	<1.0	<1.0	<3.0	<1.0	--	--	<10.0	<10.0
MW-9	12/22/2011	(LFP)	14.62	3.10	0.0	11.52	222	<76	<380	0.30	<1.0	<1.0	<3.0	--	--	--	<10.0	<10.0
MW-9	9/2/2015	(LFP)	14.62	4.45	0.0	10.17	67(J)	<45	<100	<0.50	<0.50	<0.50	<0.50	<0.50	<0.0096	<0.50	0.30(J)	<0.13
MW-10	10/1/2010	(LFP)	15.03	3.56	0.0	11.47	<50	<120	<240	<1.0	<1.0	<1.0	<2.0	--	--	--	<2.0(^)	<2.0(^)
MW-10	10/1/2010	(Dup)(LFP)	15.03	3.56	0.0	11.47	<50	<120	<240	<1.0	<1.0	<1.0	<2.0	--	--	--	<2.0(^)	<2.0(^)
MW-10	12/29/2010	(LFP)	15.03	2.70	0.0	12.33	<50.0	<77	<380	<0.20	<1.0	<1.0	<3.0	--	--	--	<10.0	<10.0

Table 1
Groundwater Gauging Data and Select Analytical Results
WA-OLYMP

1120 West Bay Drive, Olympia, WA

All analytical results are presented in micrograms per liter (µg/L)

Well	Date	Notes	TOC	DTW	NAPL	GWE	GRO	DRO	HO	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE	EDB	EDC	Total Lead	Dissolved Lead
Model Toxics Control Act (MTCA) Method A Cleanup Levels (CULs) in µg/L							**800/1,000**	**500**	**500**	**5**	**1,000**	**700**	**1,000**	**20**	**0.01**	**5**	**15**	**15**
MW-10	3/17/2011	(LFP)	15.03	2.92	0.0	12.11	<50	<120	<240(^)	<1.0	<1.0	<1.0	<2.0	--	--	--	<2.0	<2.0
MW-10	4/19/2011		15.03	3.08	0.0	11.95	--	--	--	--	--	--	--	--	--	--	--	--
MW-10	6/11/2011	(LFP)	15.03	3.10	0.0	11.93	<50.0	<86	<430	<0.20	<1.0	<1.0	<3.0	--	--	--	<10.0	<10.0
MW-10	9/22/2011	(LFP)	15.03	3.31	0.0	11.72	<50.0	<75	<380	<0.20	<1.0	<1.0	<3.0	<1.0	--	--	<10.0	<10.0
MW-10	12/22/2011	(LFP)	15.03	3.21	0.0	11.82	<50.0	<75	<380	<0.20	<1.0	<1.0	<3.0	--	--	--	<10.0	<10.0
MW-10	9/2/2015	(LFP)	15.03	3.90	0.0	11.13	<50	<45	<100	<0.50	<0.50	<0.50	<0.50	<0.50	<0.0094	<0.50	2.1	0.15(J)
MW-11	10/1/2010	(LFP)	15.75	2.75	0.0	13.00	<50	<120	<240	<1.0	<1.0	<1.0	<2.0	--	--	--	<2.0(^)	<2.0(^)
MW-11	12/29/2010		15.75	2.10	0.0	13.65	--	--	--	--	--	--	--	--	--	--	--	--
MW-11	12/30/2010	(LFP)	15.75	--	--	--	<50.0	110	<380	<0.20	<1.0	<1.0	<3.0	--	--	--	<10.0	<10.0
MW-11	3/17/2011	(LFP)	15.75	1.74	0.0	14.01	<50	<120	<240(^)	<1.0	<1.0	<1.0	<2.0	--	--	--	<2.0	<2.0
MW-11	4/19/2011		15.75	1.94	0.0	13.81	--	--	--	--	--	--	--	--	--	--	--	--
MW-11	6/11/2011	(LFP)	15.75	2.09	0.0	13.66	<50.0	<84	<420	<0.20	<1.0	<1.0	<3.0	--	--	--	<10.0	<10.0
MW-11	9/22/2011	(LFP)	15.75	2.82	0.0	12.93	<50.0	<75	<380	<0.20	<1.0	<1.0	<3.0	<1.0	--	--	<10.0	<10.0
MW-11	12/22/2011	(LFP)	15.75	2.49	0.0	13.26	<50.0	<86	<430	<0.20	<1.0	<1.0	<3.0	--	--	--	<10.0	<10.0
MW-11	9/2/2015	(LFP)	15.75	2.42	0.0	13.33	<50	<48	<110	<0.50	<0.50	<0.50	<0.50	<0.50	<0.0096	<0.50	0.87(J)	<0.13
MW-12	10/1/2010	(LFP)	15.60	2.63	0.0	12.97	<50	<120	<240	<1.0	<1.0	<1.0	<2.0	--	--	--	<2.0(^)	<2.0(^)
MW-12	12/29/2010		15.60	1.95	0.0	13.65	--	--	--	--	--	--	--	--	--	--	--	--
MW-12	12/30/2010	(LFP)	15.60	--	--	--	<50.0	89	<380	<0.20	<1.0	<1.0	<3.0	--	--	--	<10.0	<10.0
MW-12	3/17/2011	(LFP)	15.60	1.56	0.0	14.04	<50	<120	<240(^)	<1.0	<1.0	<1.0	<2.0	--	--	--	<2.0	<2.0
MW-12	4/19/2011		15.60	1.86	0.0	13.74	--	--	--	--	--	--	--	--	--	--	--	--
MW-12	6/11/2011	(LFP)	15.60	1.97	0.0	13.63	<50.0	<82	<410	<0.20	<1.0	<1.0	<3.0	--	--	--	<10.0	<10.0
MW-12	9/22/2011	(LFP)	15.60	2.51	0.0	13.09	<50.0	<75	<380	<0.20	<1.0	<1.0	<3.0	<1.0	--	--	<10.0	<10.0
MW-12	12/22/2011	(LFP)	15.60	2.38	0.0	13.22	<50.0	<85	<430	<0.20	<1.0	<1.0	<3.0	--	--	--	<10.0	<10.0
MW-12	9/2/2015	(LFP)	15.60	2.18	0.0	13.42	<50	<48	<110	<0.50	<0.50	<0.50	<0.50	<0.50	<0.0096	<0.50	<0.13	<0.13

TOC = Top of casing in feet North American Vertical Datum of 1988 (NAVD 88)
DTW = Depth to water in feet below TOC
NAPL = Non-aqueous phase liquid thickness in feet
GWE = Groundwater elevation in feet NAVD 88
GRO = Total petroleum hydrocarbons - gasoline range organics
DRO = Total petroleum hydrocarbons - diesel range organics
HO = Total petroleum hydrocarbons - heavy oil range organics
MTBE = Methyl tertiary butyl ether
EDB = Ethylene dibromide
EDC = 1,2-Dichloroethane
800/1,000 = GRO MTCA Method A CUL with benzene present is 800 µg/L and without is 1,000 µg/L
LF/LFP = Low flow (purge) sample
< = Analytical result is less than reporting limit shown
-- = Not analyzed/not applicable
^ = Instrument related QC exceeds the control limits
DUP = Duplicate sample
Y = Laboratory qualifier: Results in the diesel organics range are primarily due to overlap from a gasoline range product.
Wells were resurveyed in 2010 and are referenced to vertical datum NAVD 88 and horizontal datum NAD 83/98
If NAPL is present, the GWE is corrected according to the following formula (TOC elevation - depth to water) + (0.8 x NAPL thickness)
Data collected prior to 2010 have been provided by previous consultants and are included as historical reference only
GRO, DRO, HO analyzed by Ecology Northwest Methods; Benzene, toluene, ethylbenzene, and total xylenes (BTEX), MTBE, and EDB by 8260B; Lead by U.S. Environmental

BOLD constituent detected above MTCA Cleanup Levels

Table 2
Groundwater Analytical Results for cPAHs and Napthalenes
Former Industrial Petroleum Distributors Bulk Terminal
1120 West Bay Drive, Olympia, WA

All analytical results are presented in micrograms per liter (µg/L)

Well	Date	Notes	Benzo (a) anthracene	Benzo (a) pyrene	Benzo (b) fluoranthene	Benzo (k) fluoranthene	Chrysene	Dibenzo (a,h) anthracene	Indeno (1,2,3-cd) pyrene	cPAH B(a)P Equivalents	Napthalene	1-Methylnaphthalene	2-Methylnaphthalene	Naphthalenes
Model Toxics Control Act (MTCA) Method A Cleanup Levels (CULs) in µg/L			**NE (b)**	**0.1**	**NE (b)**	**NE (b)**	**NE (b)**	**NE (b)**	**NE (b)**	**0.1 (b)**	**NE(a)**	**NE(a)**	**NE(a)**	**160 (a)**
MW-6R	10/2/2010	(LFP)	< 0.0097	**0.019**	**0.017**	0.0097	**0.011**	0.0097	**0.011**	0.0243	**0.010**	< 0.0097	< 0.013	0.0214
MW-6R	12/30/2010	(LFP)	< 0.095	< 0.095	< 0.095	< 0.095	< 0.095	< 0.095	< 0.095	0.0717	< 0.095	< 0.095	< 0.095	0.143
MW-6R	12/30/2010	(Dup)(LFP)	< 0.095	< 0.095	< 0.095	< 0.095	< 0.095	< 0.095	< 0.095	0.0717	< 0.095	< 0.095	< 0.095	0.143
MW-6R	3/17/2011	(LFP)	< 0.094	< 0.094	< 0.094	< 0.094	< 0.061	< 0.094	< 0.094	0.0708	< 0.47	< 0.14	< 0.094	0.352
MW-6R	6/11/2011	(LFP)	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	0.0831	< 0.11	< 0.11	< 0.11	0.165
MW-6R	9/22/2011	(LFP)	< 0.094	< 0.094	< 0.094	< 0.094	< 0.094	< 0.094	< 0.094	0.0710	< 0.094	< 0.094	< 0.094	0.141
MW-6R	12/22/2011	(LFP)	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.0755	< 0.1	< 0.1	< 0.1	0.150
MW-6R	12/22/2011	(Dup)(LFP)	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	0.0831	< 0.11	< 0.11	< 0.11	0.165
MW-6R	9/2/2015	(LFP)	< 0.01	**0.018** J	**0.016** J	< 0.01	< 0.01	< 0.01	**0.015** J	0.0227	< 0.03	< 0.01	< 0.01	0.025
MW-7	10/1/2010	(LFP)	**0.017**	< 0.019	< 0.0097	< 0.0097	< 0.0097	< 0.0097	< 0.0097	0.0132	**0.086**	**0.23**	**0.16**	0.476
MW-7	12/29/2010	(LFP)	< 0.096	< 0.096	< 0.096	< 0.096	< 0.096	< 0.096	< 0.096	0.0725	< 0.096	< 0.096	< 0.096	0.144
MW-7	3/17/2011	(LFP)	< 0.094	< 0.094	< 0.094	< 0.094	< 0.061	< 0.094	< 0.094	0.0708	< 0.47	< 0.14	< 0.094	0.352
MW-7	6/11/2011	(LFP)	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	0.0831	< 0.11	< 0.11	< 0.11	0.165
MW-7	6/11/2011	(DUP)(LFP)	< 0.095	< 0.095	< 0.095	< 0.095	< 0.095	< 0.095	< 0.095	0.0717	< 0.11	**0.15**	**0.11**	0.315
MW-7	9/22/2011	(LFP)	< 0.094	< 0.094	< 0.094	< 0.094	< 0.094	< 0.094	< 0.094	0.0710	< 0.094	**0.16**	**0.13**	0.337
MW-7	12/22/2011	(LFP)	< 0.094	< 0.094	< 0.094	< 0.094	< 0.094	< 0.094	< 0.094	0.0710	< 0.094	**0.11**	< 0.094	0.204
MW-7	9/2/2015	(LFP)	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.0076	**0.062**	**0.16**	**0.14**	0.362
MW-7	9/2/2015	(DUP)(LFP)	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.0076	**0.088**	**0.21**	**0.18**	0.478
MW-8	10/1/2010	(LFP)	< 0.0097	< 0.019	< 0.0097	< 0.0097	**0.053**	< 0.0097	< 0.0097	0.0125	**0.085**	**0.11**	**0.038**	0.233
MW-8	12/29/2010	(LFP)	< 0.096	< 0.096	< 0.096	< 0.096	< 0.096	< 0.096	< 0.096	0.0725	< 0.096	< 0.096	< 0.096	0.144
MW-8	3/17/2011	(LFP)	< 0.094	< 0.094	< 0.094	< 0.094	< 0.061	< 0.094	< 0.094	0.0708	< 0.47	< 0.14	< 0.094	0.352
MW-8	3/17/2011	(Dup)(LFP)	< 0.094	< 0.094	< 0.094	< 0.094	< 0.061	< 0.094	< 0.094	0.0708	< 0.47	< 0.14	< 0.094	0.352
MW-8	6/11/2011	(LFP)	< 0.096	< 0.096	< 0.096	< 0.096	< 0.096	< 0.096	< 0.096	0.0725	< 0.096	< 0.096	< 0.096	0.144
MW-8	9/22/2011	(LFP)	< 0.094	< 0.094	< 0.094	< 0.094	< 0.094	< 0.094	< 0.094	0.0710	**0.12**	**0.13**	< 0.094	0.297
MW-8	12/22/2011	(LFP)	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	0.0831	< 0.11	< 0.11	< 0.11	0.165
MW-8	9/2/2015	(LFP)	< 0.01	< 0.01	< 0.01	< 0.01	**0.012** J	< 0.01	< 0.01	0.0076	**0.096**	**0.12**	**0.051** J	0.267
MW-9	10/1/2010	(LFP)	< 0.0094	< 0.019	< 0.0094	< 0.0094	< 0.0094	< 0.0094	< 0.0094	0.0119	**0.400**	**0.019**	**0.013**	0.432
MW-9	12/29/2010	(LFP)	< 0.095	< 0.095	< 0.095	< 0.095	< 0.095	< 0.095	< 0.095	0.0717	0.59	< 0.095	< 0.095	0.685
MW-9	3/17/2011	(LFP)	< 0.094	< 0.094	< 0.094	< 0.094	< 0.061	< 0.094	< 0.094	0.0708	1.9	< 0.38	< 0.94	2.560
MW-9	6/11/2011	(LFP)	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	0.0831	**0.36**	< 0.11	< 0.11	0.470
MW-9	9/22/2011	(LFP)	< 0.094	< 0.094	< 0.094	< 0.094	< 0.094	< 0.094	< 0.094	0.0710	< 0.094	< 0.094	< 0.094	0.141
MW-9	12/22/2011	(LFP)	< 0.094	< 0.094	< 0.094	< 0.094	< 0.094	< 0.094	< 0.094	0.0710	**2.6**	**0.17**	< 0.094	2.817
MW-9	9/2/2015	(LFP)	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.0076	**0.37**	**0.12**	**0.058**	0.548
MW-10	10/1/2010	(LFP)	< 0.0094	< 0.019	< 0.0094	< 0.0094	< 0.0094	< 0.0094	< 0.0094	0.0119	< 0.0094	< 0.0094	< 0.012	0.015
MW-10	12/29/2010	(LFP)	< 0.096	< 0.096	< 0.096	< 0.096	< 0.096	< 0.096	< 0.096	0.0725	< 0.096	< 0.096	< 0.096	0.144
MW-10	3/17/2011	(LFP)	< 0.28	< 0.19	< 0.38	< 0.28	< 0.19	< 0.28	< 0.28	0.1710	< 0.47	< 0.14	< 0.094	0.352
MW-10	6/11/2011	(LFP)	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	0.0831	< 0.11	< 0.11	< 0.11	0.165
MW-10	9/22/2011	(LFP)	< 0.094	< 0.094	< 0.094	< 0.094	< 0.094	< 0.094	< 0.094	0.0710	< 0.094	< 0.094	< 0.094	0.141
MW-10	12/22/2011	(LFP)	< 0.095	< 0.095	< 0.095	< 0.095	< 0.095	< 0.095	< 0.095	0.0717	< 0.095	< 0.095	< 0.095	0.143
MW-10	9/2/2015	(LFP)	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.0076	< 0.03	< 0.01	< 0.01	0.025
MW-11	10/1/2010	(LFP)	< 0.0098	< 0.020	< 0.0098	< 0.0098	< 0.0098	< 0.0098	< 0.0098	0.0125	**0.012**	< 0.0098	< 0.013	0.023
MW-11	12/30/2010	(LFP)	< 0.095	< 0.095	< 0.095	< 0.095	< 0.095	< 0.095	< 0.095	0.0717	< 0.095	< 0.095	< 0.095	0.143
MW-11	3/17/2011	(LFP)	< 0.094	< 0.094	< 0.094	< 0.094	< 0.061	< 0.094	< 0.094	0.0708	< 0.47	< 0.14	< 0.094	0.352
MW-11	6/11/2011	(LFP)	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	0.0831	< 0.11	< 0.11	< 0.11	0.165
MW-11	9/22/2011	(LFP)	< 0.094	< 0.094	< 0.094	< 0.094	< 0.094	< 0.094	< 0.094	0.0710	< 0.094	< 0.094	< 0.094	0.141
MW-11	12/22/2011	(LFP)	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	0.0831	< 0.11	< 0.11	< 0.11	0.165
MW-11	9/2/2015	(LFP)	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.0076	< 0.03	< 0.01	< 0.01	0.025
MW-12	10/1/2010	(LFP)	< 0.0097	< 0.019	< 0.0097	< 0.0097	< 0.0097	< 0.0097	< 0.0097	0.0120	**0.019**	< 0.0097	< 0.013	0.030
MW-12	10/1/2010	(Dup)(LFP)	< 0.0096	< 0.019	< 0.0096	< 0.0096	< 0.0096	< 0.0096	< 0.0096	0.0119	**0.020**	< 0.0096	< 0.012	0.031
MW-12	12/30/2010	(LFP)	< 0.096	< 0.096	< 0.096	< 0.096	< 0.096	< 0.096	< 0.096	0.0725	< 0.096	< 0.096	< 0.096	0.144
MW-12	3/17/2011	(LFP)	< 0.094	< 0.094	< 0.094	< 0.094	< 0.061	< 0.094	< 0.094	0.0708	< 0.47	< 0.14	< 0.094	0.352
MW-12	6/11/2011	(LFP)	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	0.0831	< 0.11	< 0.11	< 0.11	0.165
MW-12	9/22/2011	(LFP)	< 0.094	< 0.094	< 0.094	< 0.094	< 0.094	< 0.094	< 0.094	0.0710	< 0.094	< 0.094	< 0.094	0.141
MW-12	12/22/2011	(LFP)	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	0.0831	< 0.11	< 0.11	< 0.11	0.165
MW-12	9/2/2015	(LFP)	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.0076	< 0.03	< 0.01	< 0.01	0.025

-- = Not analyzed/not applicable
Dup = Duplicate sample
LFP = Low flow purge and sample
PAHs = Polycyclic Aromatic Hydrocarbons
RCRA = Resource Conservation and Recovery Act
^ = Laboratory qualifier: ICV, CCV, ICB, CCB, ISA, ISB, CRI, CRA, DLCK or MRL standard indicates instrument related QC exceeds the control limits.
(a) = See MTCA cleanup level for naphthalenes. This is a total value for naphthalene, 1-methylnaphthalene and 2-methylnaphthalene WAC 173-340-900(Table 720-1)

NE = Cleanup level not evaluated under MTCA
J = Estimated value ≥ the Method Detection Limit and < the Limit of Quantitation
< = Sample not detected above the Method Detection Limit
BOLD constituent detected above Laboratory Reporting Limit
BOLD constituent detected above MTCA Cleanup Levels

ARCADIS

Groundwater Monitoring Well Gauging Form

Site ID: WA- 60 (BP Olympic Project #: GP09BPNA.WA60

Site Address: 1117 W Bay Drive Date: 9-2-15

Well ID	Time	Sheen/ Odor	LNAPL Depth	LNAPL Thickness	DTW	TD	PID	Water / OW-IF Probe	Notes
MW-6R	1250	NO	—	—	1.42	12.20	0.1	✓	3 of 3 Bolts
MW-12	1300	NO	—	—	2.18	11.93	0.2	✓	2 of 3 Bolts
MW-11	1310	NO	—	—	2.42	13.22	0.2	✓	3 of 3 Bolts
MW-10	1320	NO	—	—	3.90	13.12	0.4	✓	2 of 5 Bolts
MW-9	1330	NO	—	—	4.45	13.29	0.0	✓	3 of 3 Bolts
MW-8	1340	NO	—	—	4.96	13.30	0.1	✓	3 of 3 Bolts
MW-7	1350	NO	—	—	5.60	13.04	0.0	✓	3 of 3 Bolts

Notes:

ARCADIS Groundwater Sampling Form

Project No. GP09BPNAWA60 Well ID MW-7 Date 1-2-15

Project Name/Location Olympia Bulk Plant Weather Clear

Measuring Pt. Description Top of casing
Screen Setting (ft-bmp)
Casing Diameter (in.) 2"
Well Material X PVC ___ SS

Static Water Level (ft-btoc) 5.6
Total Depth (ft-btoc) 13.10
Water Column/ Gallons in Well 7.5 x 0.16 = 1.2 gal
Initial PID Reading (ppm) 0.0

TOC Elevation
~~Pump Intake (ft-btoc)~~ ~~10'~~
Purge Method: low flow pump
Centrifugal
Submersible
~~Other~~
peristaltic X
Sample Method LFP

Pump On/Off 1455
Volumes Purged .75

Sample Time: Label 2030
Start —
End —
Replicate/ Code No. DUP-1

Sampled by JL

Time	Minutes Elapsed	Rate (gpm) (mL/min)	Depth to Water (ft)	Gallons Purged	pH	Cond. (µMhos) (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C) (°F)	Redox (mV)	Appearance Color	Appearance Odor
1455	0	200	5.60	0	7.30	4615	—	1.29	15.3	-56.9	clear	none
1458	3	↓	5.60	0.15	7.20	4060	—	0.79	15.5	-52.9	↓	↓
2001	6		5.60	0.70	7.26	4760	—	0.50	15.1	-58.9		
2004	9		5.59	0.45	7.23	4972	—	0.42	14.8	-59.3		
2007	12		5.59	0.60	7.21	5610	—	0.31	14.5	-63.9		
2010	15		5.59	0.75	7.20	5512	—	0.32	14.5	-68.9		
2013	18	↓	5.59	0.90	7.19	5450	—	0.38	14.3	-71.0	↓	↓
		Sample labels			2030							

Constituents Sampled	Container	Number	Preservative
GRO	VOA	6	HCL
BTEX/MTBE/EDC	VOA	6	↓
EDB	VOA	4	↓
DRO/ILO	250 mL Amber	4	HCL
PAHs	250 mL Amber	4	None
Total Lead	250 mL poly	2	HCL

Well Casing Volumes

Gallons/Foot 1" = 0.04 | 1.25" = 0.06 | 1.5" = 0.09 | 2" = 0.16 | 2.5" = 0.26 | 3" = 0.37 | 3.5" = 0.50 | 4" = 0.65 | 6" = 1.47

Well Information

Well Location: MW-7
Condition of Well: Good
Well Completion: (Flush Mount) / Stick Up

Well Locked at Arrival: Yes / (No)
Well Locked at Departure: Yes / (No)
Key Number To Well:

ARCADIS Groundwater Sampling Form

Project No. GP09BPNA.WA60 | Well ID MW-6R | Date 9-2-15

Project Name/Location BP-Olympia / 1117 W Bay Drive, Olympia, WA | Weather Overcast

Measuring Pt. Description: top of casing | Casing Diameter (in.): 2" | Pump Intake (ft-btoc): ~5.5 ft | Well Material: X PVC / SS

Static Water Level (ft-btoc): 1.92 | Total Depth (ft-btoc): ~~42.97~~ 12.20 | Water Column/ Gallons in Well: 5.14 x 0.16 / 0.822 | Initial PID Reading (ppm): 0.1

Pump On/Off: 1500 | Volumes Purged: .91 | Purge Method: low-flow purge (Centrifugal / Submersible / Peristaltic X) | Sample Method: low flow

Sample Time: Label 1515, Start, End | Replicate/ Code No. — | Sampled by: ~~RB~~ JL

Time	Minutes Elapsed	Rate (gpm) (mL/min)	Depth to Water (ft)	Gallons Purged	pH	Cond. (µS/cm) (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C) (°F)	Redox (mV)	Appearance Color	Appearance Odor
1500	0	200	1.92	.15	8.43	179.3	—	2.79	12.8	83.4	Clear	None
1503	3	200	2.01	.30	8.08	172.6	—	1.58	12.1	93.5	Clear	None
1506	6	200	2.03	.45	7.79	173.3	—	~~1.93~~ 1.93	12.0	87.1	Clear	None
1509	9	200	2.05	.60	7.71	172.0	—	1.15	11.9	84.2	Clear	None
1512	12	200	2.08	.75	7.76	172.8	—	1.30	11.9	81.9	Clear	None
Sampled												
Collected												
					± 0.1	± 3%	± 10%	± 10%	± 3%	± 10		

1515

Constituents Sampled	Container		Number	Preservative
GRO		VOA	3	HCl
BTEX/MTBE/EDC		VOA	3	HCl
EDB		VOA	2	HCl
DRO/HO	250 ml	AMBER	2	HCl
PAH	250 ml	Amber	2	none
Total Lead	250 ml	POLY	1	HNO3

Well Casing Volumes

Gallons/Foot: 1" = 0.04; 1.25" = 0.06; 1.5" = 0.09; 2" = 0.16; 2.5" = 0.26; 3" = 0.37; 3.5" = 0.50; 4" = 0.65; 6" = 1.47

Well Information

Well Location: MW-6R

Condition of Well: 3/3 bolts

Well Completion: (Flush Mount) / Stick Up

Well Locked at Arrival: Yes / (No)

Well Locked at Departure: Yes / (No)

Key Number To Well:

MW-6R 8/28/2015

ARCADIS

Groundwater Sampling Form

Project No. GP09BPNA.WA60 Well ID MW-8 Date 9-7-15

Project Name/Location BP-Olympia / 1117 W Bay Drive, Olympia, WA Weather Clear

Measuring Pt. Description: top of casing
Casing Diameter (in.): 2"
Pump Intake (ft-btoc): ~10 ft
Well Material: X PVC ___ SS

Static Water Level (ft-btoc): ~~5.00~~ 4.96
Total Depth (ft-btoc): ~~13.31~~ ~~13.01~~ 13.30
Water Column/ Gallons in Well: 1.18
Initial PID Reading (ppm): 0.1

Pump On/Off: 1914
Volumes Purged: .63
Purge Method: low-flow purge
Sample Method: low flow

Sample Time: Label 1930 Start ___ End ___
Replicate/ Code No. ———
Centrifugal ___ Submersible ___ Peristaltic X
Sampled by: RB

Time	Minutes Elapsed	Rate (gpm) (mL/min)	Depth to Water (ft)	Gallons Purged	pH	Cond. (µS/cm) (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C) (°F)	Redox (mV)	Appearance Color	Appearance Odor
1914	0	200	5.60	0.15	7.41	3970	—	1.26	14.6	-52.5	Clear	None
1917	3	200	5.65	0.30	7.38	3582	—	2.44	14.8	-64.9	"	"
1920	6	200	5.65	0.45	7.36	3549	—	3.10	14.9	-65.5	"	"
1923	12	200	5.63	0.60	7.35	3935	—	2.86	14.8	-61.5	"	"
1926	15	200	5.63	0.75	7.34	3745	—	2.81	14.7	-61.3	"	"
					± 0.1	± 3%	± 10%	± 10%	± 3%	± 10		

Sample @ 1930

Constituents Sampled	Container		Number	Preservative
GRO		VOA	3	HCl
BTEX/MTBE/EDC		VOA	3	HCl
EDB		VOA	2	HCl
DRO/HO	250 ml	AMBER	2	HCl
PAH	250 ml	Amber	2	none
Total Lead	250 ml	POLY	1	HNO3

Well Casing Volumes
Gallons/Foot: 1" = 0.04; 1.25" = 0.06; 1.5" = 0.09; 2" = 0.16; 2.5" = 0.26; 3" = 0.37; 3.5" = 0.50; 4" = 0.65; 6" = 1.47

Well Information

Well Location: MW-8
Condition of Well: 5.13 0.10
Well Completion: (Flush Mount) / Stick Up
Well Locked at Arrival: Yes / (No)
Well Locked at Departure: Yes / (No)
Key Number To Well:

MW-8 8/25/2015

ARCADIS Groundwater Sampling Form

Project No. GP09BPNA.WA60 | Well ID MW-9 | Date 9-2-15

Project Name/Location BP-Olympia / 1117 W Bay Drive, Olympia, WA | Weather Clear

Measuring Pt. Description	top of casing	Casing Diameter (in.)	~~4~~ 2"	Pump Intake (ft-btoc)	~8'
Static Water Level (ft-btoc)	4.45	Total Depth (ft-btoc)	~~13.15~~ 13.26	Water Column/ Gallons in Well	8.84 × 0.16 = 1.41 gal
Pump On/Off	1631	Volumes Purged	.32	Purge Method:	low-flow purge
Sample Time: Label	1650	Replicate/ Code No.		Centrifugal / Submersible / Peristaltic	X
Start					
End					

Well Material: X PVC / SS

Initial PID Reading (ppm): 0.0

Sample Method: low flow

Sampled by: JV ~~RB~~

Time	Minutes Elapsed	Rate (gpm) (mL/min)	Depth to Water (ft)	Gallons Purged	pH	Cond. (µS/cm) (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C) (°F)	Redox (mV)	Appearance Color	Appearance Odor
1636	0	200	4.45	0	7.58	3533	—	2.29	13.8	-6.0	Cloudy	None
1639	3	200	4.42	0.15	7.72	3499	—	1.37	13.9	-15.5	"	"
1641	6	200	4.40	0.20	7.66	3475	—	1.49	13.9	-14.1		
1644	9	200	4.39	0.45	7.65	3490	—	1.45	13.9	-10.1		
	Sample @ 1650											
					± 0.1	± 3%	± 10%	± 10%	± 3%	± 10		

Constituents Sampled	Container		Number	Preservative
GRO		VOA	3	HCl
BTEX/MTBE/EDC		VOA	3	HCl
EDB		VOA	2	HCl
DRO/HO	250 ml	AMBER	2	HCl
PAH	250 ml	Amber	2	none
Total Lead	250 ml	POLY	1	HNO3

Well Casing Volumes

Gallons/Foot: 1" = 0.04; 1.25" = 0.06; 1.5" = 0.09; 2" = 0.16; 2.5" = 0.26; 3" = 0.37; 3.5" = 0.50; 4" = 0.65; 6" = 1.47

Well Information

Well Location: MW-9

Condition of Well: good

Well Completion: Flush Mount / Stick Up

Well Locked at Arrival: Yes / No

Well Locked at Departure: Yes / No

Key Number To Well:

ARCADIS Groundwater Sampling Form

Project No. GP09BPNA.WA60 | Well ID MW-10 | Date

Project Name/Location BP-Olympia / 1117 W Bay Drive, Olympia, WA | Weather

Measuring Pt. Description: top of casing | Casing Diameter (in.): 4" | Pump Intake (ft-btoc): ≈8.5' | Well Material: X PVC ___ SS

Static Water Level (ft-btoc): 3.90 | Total Depth (ft-btoc): ~~18.31~~ 13.12 | Water Column/ Gallons in Well: 9.22 × 0.16 = 1.48 | Initial PID Reading (ppm): 0.4

Pump On/Off: IS | Volumes Purged: 0.51 | Purge Method: low-flow purge | Sample Method: low flow

Sample Time: Label 1800, Start ___, End ___ | Replicate/ Code No. ___ | Centrifugal ___, Submersible ___, Peristaltic X | Sampled by: JK RB

Time	Minutes Elapsed	Rate (gpm) (mL/min)	Depth to Water (ft)	Gallons Purged	pH	Cond. (µS/cm) (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C) (°F)	Redox (mV)	Appearance Color	Appearance Odor
1845	0	200	3.90	0	7.80	194.4	—	4.26	14.1	111.7		
1848	3	200	3.89	0.15	7.84	191.2	—	2.39	13.8	111.7		
1851	6	200	3.81	0.30	7.85	191.7	—	2.56	13.9	116.0		
1854	12	200	3.88	0.45	7.79	191.3	—	1.90	13.8	119.6		
1857	15	200	3.80	0.60	7.72	190.4	—	1.90	13.7	125.7		
1800	18	200	3.76	0.75	7.72	190.8	—	2.10	13.4	125.2		
					± 0.1	± 3%	± 10%	± 10%	± 3%	± 10		

0 1800

Constituents Sampled	Container		Number	Preservative
GRO		VOA	3	HCl
BTEX/MTBE/EDC		VOA	3	HCl
EDB		VOA	2	HCl
DRO/HO	250 ml	AMBER	2	HCl
PAH	250 ml	Amber	2	none
Total Lead	250 ml	POLY	1	HNO3

Well Casing Volumes

Gallons/Foot: 1" = 0.04; 1.25" = 0.06; 1.5" = 0.09; 2" = 0.16; 2.5" = 0.26; 3" = 0.37; 3.5" = 0.50; 4" = 0.65; 6" = 1.47

Well Information

Well Location: MW-10

Condition of Well: 2 of 3 bolts

Well Completion: Flush Mount / Stick Up

Well Locked at Arrival: Yes / No

Well Locked at Departure: Yes / No

Key Number To Well:

ARCADIS Groundwater Sampling Form

Project No. GP09BPNA.WA60 | Well ID MW-11 | Date 4-2-15

Project Name/Location BP-Olympia / 1117 W Bay Drive, Olympia, WA | Weather Overcast

Measuring Pt. Description: top of casing | Casing Diameter (in.): 2" | Pump Intake (ft-btoc): ~8" | Well Material: X PVC / SS

Static Water Level (ft-btoc): 7.42 | Total Depth (ft-btoc): 13.1 13.22 | Water Column/ Gallons in Well: 10.8 x .16 = 1.72 | Initial PID Reading (ppm): 0.2

Pump On/Off: 1703 | Volumes Purged: 0.28 | Purge Method: low-flow purge | Sample Method: low flow

Sample Time: Label 1725, Start, End | Replicate/ Code No. | Centrifugal, Submersible, Peristaltic X | Sampled by: JC ~~RB~~

Time	Minutes Elapsed	Rate (gpm) (mL/min)	Depth to Water (ft)	Gallons Purged	pH	Cond. (µS/cm) (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C) (°F)	Redox (mV)	Appearance Color	Appearance Odor
1703	0	200	7.42	0	7.72	189.1	—	3.61	14.4	99.5	Yellow	None
1706	3	"	7.36	.15	7.86	189.4	—	1.41	13.3	109.5	None	"
1709	6	"	7.34	.30	7.78	190.0	—	1.25	13.0	119.0	"	"
1712	9	"	7.32	.45	7.64	190.2	—	1.20	13.3	131.9	"	"
1715	12	"	7.30	.60	7.65	190.2	—	1.20	13.1	132.7	"	"
1718	15	"	7.28	.75	7.72	189.9		1.17	~~13.7~~ 13.2	131.0	"	"
	Sample label											
			1725									
					± 0.1	± 3%	± 10%	± 10%	± 3%	± 10		

Constituents Sampled	Container		Number	Preservative
GRO		VOA	3	HCl
BTEX/MTBE/EDC		VOA	3	HCl
EDB		VOA	2	HCl
DRO/HO	250 ml	AMBER	2	HCl
PAH	250 ml	Amber	2	none
Total Lead	250 ml	POLY	1	HNO3

Well Casing Volumes

Gallons/Foot: 1" = 0.04; 1.25" = 0.06; 1.5" = 0.09; 2" = 0.16; 2.5" = 0.26; 3" = 0.37; 3.5" = 0.50; 4" = 0.65; 6" = 1.47

Well Information

Well Location: MW-11

Condition of Well: 3 of 3 bolts

Well Completion: Flush Mount / Stick Up

Well Locked at Arrival: Yes / No

Well Locked at Departure: Yes / No

Key Number To Well:

MW-11

8/26/2015

ARCADIS Groundwater Sampling Form

Project No. GP09BPNA.WA60 | Well ID MW-12 | Date 9-2-15

Project Name/Location BP-Olympia / 1117 W Bay Drive, Olympia, WA | Weather Overcast / Sunbreak

Measuring Pt. Description: top of casing | Casing Diameter (in.): ~~2~~ 2" | Pump Intake (ft-btoc): ~6.5 ft | Well Material: X PVC / SS

Static Water Level (ft-btoc): 2.18 | Total Depth (ft-btoc): ~~12.46~~ 11.93 | Water Column/ Gallons in Well: 9.75 x 0.16 / 1.56 | Initial PID Reading (ppm): 0.2

Pump On/Off: 1600 | Volumes Purged: 0.38 | Purge Method: low-flow purge | Sample Method: low flow

Sample Time: Label 1620, Start, End | Replicate/ Code No. | Centrifugal / Submersible / Peristaltic X | Sampled by: JL ~~DB~~

Time	Minutes Elapsed	Rate (gpm) (mL/min)	Depth to Water (ft)	Gallons Purged	pH	Cond. (µS/cm) (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C) (°F)	Redox (mV)	Appearance	
											Color	Odor
1600	0	200	2.18	0	7.91	188.3	—	7.68	13.7	116.6	Clear	None
1603	3	200	2.29	0.15	8.08	187.6	—	1.57	13.6	122.5	Clear	"
1606	6	200	2.31	0.30	7.75	188.4	—	1.46	13.3	129.2	"	"
1609	9	200	2.32	0.45	7.65	187.0	—	1.41	13.3	131.2	"	"
1612	12	200	2.32	0.60	7.64	187.9	—	1.40	13.2	129.4	"	"
	Sample label @ 1620											
					± 0.1	± 3%	± 10%	± 10%	± 3%	± 10		

Constituents Sampled	Container		Number	Preservative
GRO		VOA	3	HCl
BTEX/MTBE/EDC		VOA	3	HCl
EDB		VOA	2	HCl
DRO/HO	250 ml	AMBER	2	HCl
PAH	250 ml	Amber	2	none
Total Lead	250 ml	POLY	1	HNO3

Well Casing Volumes

Gallons/Foot: 1" = 0.04; 1.25" = 0.06; 1.5" = 0.09; 2" = 0.16; 2.5" = 0.26; 3" = 0.37; 3.5" = 0.50; 4" = 0.65; 6" = 1.47

Well Information

Well Location: MW-12

Condition of Well: 2 of 3 bolts

Well Completion: Flush Mount / Stick Up

Well Locked at Arrival: Yes / No

Well Locked at Departure: Yes / No

Key Number To Well:

ANALYTICAL RESULTS

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Highlands Ranch CO 80129

September 21, 2015

Project: Former Olympia Bulk Plant

Submittal Date: 09/04/2015
Group Number: 1590593
PO Number: GP09BPNA.WA60
State of Sample Origin: WA

Client Sample Description	Lancaster Labs (LL) #
MW-6R Water	8036462
MW-6R Filtered Water	8036463
MW-7 Water	8036464
MW-7 Filtered Water	8036465
MW-8 Water	8036466
MW-8 Filtered Water	8036467
MW-9 Water	8036468
MW-9 Filtered Water	8036469
MW-10 Water	8036470
MW-10 Filtered Water	8036471
MW-11 Water	8036472
MW-11 Filtered Water	8036473
MW-12 Water	8036474
MW-12 Filtered Water	8036475
DUP-1 Water	8036476
DUP-1 Filtered Water	8036477
TRIP-BLANK Water	8036478

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our scopes of accreditation can be viewed at http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/ .

ELECTRONIC COPY TO	ARCADIS U.S., Inc.	Attn: Myles Perkins
ELECTRONIC COPY TO	ARCADIS U.S., Inc.	Attn: Brian Marcum

Respectfully Submitted,

Stacy L. Butt
Specialist

(717) 556-7236

Project Name: Former Olympia Bulk Plant
LL Group #: 1590593

General Comments:

Through our technical processes and second person review of data, we have established that our data/deliverables are in compliance with the methods and project requirements unless otherwise noted or previously resolved with the client. The compliance signature is located on the cover page of the Analysis Reports.

See the Laboratory Sample Analysis Record section of the Analysis Report for the method references.

All QC met criteria unless otherwise noted in an Analysis Specific Comment below. Refer to the QC Summary for specific values and acceptance criteria.

Project specific QC samples are not included in this data set

Matrix QC may not be reported if site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

Surrogate recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in an Analysis Specific Comment below.

The samples were received at the appropriate temperature and in accordance with the chain of custody unless otherwise noted.

Analysis Specific Comments:

No additional comments are necessary.

Sample Description: **MW-6R Water**
Former Olympia Bulk Plant COC: R219429
1117 West Bay Drive - Olympia, WA

LL Sample # WW 8036462
LL Group # 1590593
Account # 13255

Project Name: Former Olympia Bulk Plant

Collected: 09/02/2015 15:15 by JL

Submitted: 09/04/2015 09:35
Reported: 09/21/2015 14:19

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

OLY6R

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**		**ug/l**	**ug/l**	
10335	Benzene	71-43-2	N.D.		0.50	1.0	1
10335	1,2-Dichloroethane	107-06-2	N.D.		0.50	1.0	1
10335	Ethylbenzene	100-41-4	N.D.		0.50	1.0	1
10335	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		0.50	1.0	1
10335	Toluene	108-88-3	N.D.		0.50	1.0	1
10335	Xylene (Total)	1330-20-7	N.D.		0.50	1.0	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**		**ug/l**	**ug/l**	
08357	Benzo(a)anthracene	56-55-3	N.D.		0.010	0.051	1
08357	Benzo(a)pyrene	50-32-8	0.018	J	0.010	0.051	1
08357	Benzo(b)fluoranthene	205-99-2	0.016	J	0.010	0.051	1
08357	Benzo(k)fluoranthene	207-08-9	N.D.		0.010	0.051	1
08357	Chrysene	218-01-9	N.D.		0.010	0.051	1
08357	Dibenz(a,h)anthracene	53-70-3	N.D.		0.010	0.051	1
08357	Indeno(1,2,3-cd)pyrene	193-39-5	0.015	J	0.010	0.051	1
08357	1-Methylnaphthalene	90-12-0	N.D.		0.010	0.051	1
08357	2-Methylnaphthalene	91-57-6	N.D.		0.010	0.051	1
08357	Naphthalene	91-20-3	N.D.		0.030	0.061	1
GC Volatiles	**ECY 97-602 NWTPH-Gx**		**ug/l**		**ug/l**	**ug/l**	
08273	NWTPH-Gx water C7-C12	n.a.	N.D.		50	250	1
Pesticides/PCBs	**SW-846 8011**		**ug/l**		**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.		0.0094	0.028	1
GC Petroleum Hydrocarbons	**ECY 97-602 NWTPH-Dx modified**		**ug/l**		**ug/l**	**ug/l**	
12899	DX DRO C12-C24	n.a.	N.D.		46	100	1
12899	DX HRO C24-C40	n.a.	N.D.		100	250	1
Metals	**SW-846 6020**		**ug/l**		**ug/l**	**ug/l**	
06035	Lead	7439-92-1	0.72	J	0.13	1.0	1

General Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	BTEX, MTBE, EDC	SW-846 8260B	1	N152522AA	09/10/2015 03:28	Caitlin M Carmody	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	N152522AA	09/10/2015 03:28	Caitlin M Carmody	1

*=This limit was used in the evaluation of the final result

Sample Description: MW-6R Water
Former Olympia Bulk Plant COC: R219429
1117 West Bay Drive - Olympia, WA

LL Sample # WW 8036462
LL Group # 1590593
Account # 13255

Project Name: Former Olympia Bulk Plant

Collected: 09/02/2015 15:15 by JL

Submitted: 09/04/2015 09:35
Reported: 09/21/2015 14:19

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

OLY6R

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	15248WAP026	09/11/2015 19:34	Holly B Ziegler	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	15248WAP026	09/08/2015 17:30	Ryan A Schafran	1
08273	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	15247A94A	09/08/2015 15:54	Brett W Kenyon	1
01146	GC VOA Water Prep	SW-846 5030B	1	15247A94A	09/08/2015 15:54	Brett W Kenyon	1
10398	EDB in Wastewater	SW-846 8011	1	152550010A	09/19/2015 12:51	Richard A Shober	1
07786	EDB Extraction (8011)	SW-846 8011	1	152550010A	09/16/2015 09:00	Roman Kuropatkin	1
12899	DRO/DX Mini-extraction Master	ECY 97-602 NWTPH-Dx modified	1	152550007A	09/16/2015 15:41	Christine E Dolman	1
12907	Mini-extraction DRO DX (water)	ECY 97-602 NWTPH-Dx 06/97	1	152550007A	09/16/2015 02:00	Sherry L Morrow	1
06035	Lead	SW-846 6020	1	152526050004A	09/14/2015 11:08	Choon Y Tian	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	152526050004	09/11/2015 09:22	Katlin N Cataldi	1

*=This limit was used in the evaluation of the final result

Sample Description: **MW-6R Filtered Water**
Former Olympia Bulk Plant COC: R219429
1117 West Bay Drive - Olympia, WA

LL Sample # WW 8036463
LL Group # 1590593
Account # 13255

Project Name: Former Olympia Bulk Plant

Collected: 09/02/2015 15:15 by JL

Submitted: 09/04/2015 09:35
Reported: 09/21/2015 14:19

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
Metals Dissolved	**SW-846 6020**		**ug/l**	**ug/l**	**ug/l**	
06035	Lead	7439-92-1	N.D.	0.13	1.0	1

General Sample Comments

State of Washington Lab Certification No. C457
This sample was filtered in the lab for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06035	Lead	SW-846 6020	1	152526050004A	09/14/2015 11:10	Choon Y Tian	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	152526050004	09/11/2015 09:22	Katlin N Cataldi	1

*=This limit was used in the evaluation of the final result

Sample Description: **MW-7 Water**
Former Olympia Bulk Plant COC: R219429
1117 West Bay Drive - Olympia, WA

LL Sample # WW 8036464
LL Group # 1590593
Account # 13255

Project Name: Former Olympia Bulk Plant

Collected: 09/02/2015 20:30 by JL

Submitted: 09/04/2015 09:35
Reported: 09/21/2015 14:19

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

OLY07

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	**ug/l**	
10335	Benzene	71-43-2	N.D.	0.50	1.0	1
10335	1,2-Dichloroethane	107-06-2	N.D.	0.50	1.0	1
10335	Ethylbenzene	100-41-4	N.D.	0.50	1.0	1
10335	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	0.50	1.0	1
10335	Toluene	108-88-3	N.D.	0.50	1.0	1
10335	Xylene (Total)	1330-20-7	N.D.	0.50	1.0	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**	**ug/l**	**ug/l**	
08357	Benzo(a)anthracene	56-55-3	N.D.	0.010	0.051	1
08357	Benzo(a)pyrene	50-32-8	N.D.	0.010	0.051	1
08357	Benzo(b)fluoranthene	205-99-2	N.D.	0.010	0.051	1
08357	Benzo(k)fluoranthene	207-08-9	N.D.	0.010	0.051	1
08357	Chrysene	218-01-9	N.D.	0.010	0.051	1
08357	Dibenz(a,h)anthracene	53-70-3	N.D.	0.010	0.051	1
08357	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.010	0.051	1
08357	1-Methylnaphthalene	90-12-0	0.16	0.010	0.051	1
08357	2-Methylnaphthalene	91-57-6	0.14	0.010	0.051	1
08357	Naphthalene	91-20-3	0.062	0.030	0.061	1
GC Volatiles	**ECY 97-602 NWTPH-Gx**		**ug/l**	**ug/l**	**ug/l**	
08273	NWTPH-Gx water C7-C12	n.a.	N.D.	50	250	1
Pesticides/PCBs	**SW-846 8011**		**ug/l**	**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.	0.0096	0.029	1
GC Petroleum Hydrocarbons	**ECY 97-602 NWTPH-Dx modified**		**ug/l**	**ug/l**	**ug/l**	
12899	DX DRO C12-C24	n.a.	130	45	100	1
12899	DX HRO C24-C40	n.a.	N.D.	100	250	1
Metals	**SW-846 6020**		**ug/l**	**ug/l**	**ug/l**	
06035	Lead	7439-92-1	N.D.	0.13	1.0	1

General Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	BTEX, MTBE, EDC	SW-846 8260B	1	N152522AA	09/10/2015 03:05	Caitlin M Carmody	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	N152522AA	09/10/2015 03:05	Caitlin M Carmody	1

*=This limit was used in the evaluation of the final result

Sample Description: MW-7 Water
Former Olympia Bulk Plant COC: R219429
1117 West Bay Drive - Olympia, WA

LL Sample # WW 8036464
LL Group # 1590593
Account # 13255

Project Name: Former Olympia Bulk Plant

Collected: 09/02/2015 20:30 by JL

Submitted: 09/04/2015 09:35
Reported: 09/21/2015 14:19

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

OLY07

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	15248WAP026	09/11/2015 20:02	Holly B Ziegler	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	15248WAP026	09/08/2015 17:30	Ryan A Schafran	1
08273	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	15247A94A	09/08/2015 16:20	Brett W Kenyon	1
01146	GC VOA Water Prep	SW-846 5030B	1	15247A94A	09/08/2015 16:20	Brett W Kenyon	1
10398	EDB in Wastewater	SW-846 8011	1	152550010A	09/16/2015 20:32	Richard A Shober	1
07786	EDB Extraction (8011)	SW-846 8011	1	152550010A	09/16/2015 09:00	Roman Kuropatkin	1
12899	DRO/DX Mini-extraction Master	ECY 97-602 NWTPH-Dx modified	1	152550007A	09/16/2015 16:05	Christine E Dolman	1
12907	Mini-extraction DRO DX (water)	ECY 97-602 NWTPH-Dx 06/97	1	152550007A	09/16/2015 02:00	Sherry L Morrow	1
06035	Lead	SW-846 6020	1	152526050004A	09/14/2015 10:48	Choon Y Tian	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	152526050004	09/11/2015 09:22	Katlin N Cataldi	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: MW-7 Filtered Water
Former Olympia Bulk Plant COC: R219429
1117 West Bay Drive - Olympia, WA

LL Sample # WW 8036465
LL Group # 1590593
Account # 13255

Project Name: Former Olympia Bulk Plant

Collected: 09/02/2015 20:30 by JL

Submitted: 09/04/2015 09:35
Reported: 09/21/2015 14:19

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
Metals Dissolved	**SW-846 6020**		**ug/l**	**ug/l**	**ug/l**	
06035	Lead	7439-92-1	N.D.	0.13	1.0	1

General Sample Comments

State of Washington Lab Certification No. C457
This sample was filtered in the lab for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06035	Lead	SW-846 6020	1	152526050004A	09/14/2015 11:11	Choon Y Tian	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	152526050004	09/11/2015 09:22	Katlin N Cataldi	1

*=This limit was used in the evaluation of the final result

Sample Description: **MW-8 Water**
Former Olympia Bulk Plant COC: R219429
1117 West Bay Drive - Olympia, WA

LL Sample # WW 8036466
LL Group # 1590593
Account # 13255

Project Name: Former Olympia Bulk Plant

Collected: 09/02/2015 19:30 by JL

Submitted: 09/04/2015 09:35
Reported: 09/21/2015 14:19

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

OLY08

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	**ug/l**	
10335	Benzene	71-43-2	N.D.	0.50	1.0	1
10335	1,2-Dichloroethane	107-06-2	N.D.	0.50	1.0	1
10335	Ethylbenzene	100-41-4	N.D.	0.50	1.0	1
10335	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	0.50	1.0	1
10335	Toluene	108-88-3	N.D.	0.50	1.0	1
10335	Xylene (Total)	1330-20-7	N.D.	0.50	1.0	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**	**ug/l**	**ug/l**	
08357	Benzo(a)anthracene	56-55-3	N.D.	0.010	0.051	1
08357	Benzo(a)pyrene	50-32-8	N.D.	0.010	0.051	1
08357	Benzo(b)fluoranthene	205-99-2	N.D.	0.010	0.051	1
08357	Benzo(k)fluoranthene	207-08-9	N.D.	0.010	0.051	1
08357	Chrysene	218-01-9	0.012 J	0.010	0.051	1
08357	Dibenz(a,h)anthracene	53-70-3	N.D.	0.010	0.051	1
08357	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.010	0.051	1
08357	1-Methylnaphthalene	90-12-0	0.12	0.010	0.051	1
08357	2-Methylnaphthalene	91-57-6	0.051 J	0.010	0.051	1
08357	Naphthalene	91-20-3	0.096	0.031	0.061	1
GC Volatiles	**ECY 97-602 NWTPH-Gx**		**ug/l**	**ug/l**	**ug/l**	
08273	NWTPH-Gx water C7-C12	n.a.	N.D.	50	250	1
Pesticides/PCBs	**SW-846 8011**		**ug/l**	**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.	0.0095	0.028	1
GC Petroleum Hydrocarbons	**ECY 97-602 NWTPH-Dx modified**		**ug/l**	**ug/l**	**ug/l**	
12899	DX DRO C12-C24	n.a.	670	49	110	1
12899	DX HRO C24-C40	n.a.	1,000	110	270	1
Metals	**SW-846 6020**		**ug/l**	**ug/l**	**ug/l**	
06035	Lead	7439-92-1	N.D.	0.13	1.0	1

General Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	BTEX, MTBE, EDC	SW-846 8260B	1	N152522AA	09/10/2015 03:51	Caitlin M Carmody	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	N152522AA	09/10/2015 03:51	Caitlin M Carmody	1

*=This limit was used in the evaluation of the final result

Sample Description: MW-8 Water
Former Olympia Bulk Plant COC: R219429
1117 West Bay Drive - Olympia, WA

LL Sample # WW 8036466
LL Group # 1590593
Account # 13255

Project Name: Former Olympia Bulk Plant

Collected: 09/02/2015 19:30 by JL

Submitted: 09/04/2015 09:35
Reported: 09/21/2015 14:19

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

OLY08

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	15248WAP026	09/11/2015 20:30	Holly B Ziegler	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	15248WAP026	09/08/2015 17:30	Ryan A Schafran	1
08273	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	15247A94A	09/08/2015 16:45	Brett W Kenyon	1
01146	GC VOA Water Prep	SW-846 5030B	1	15247A94A	09/08/2015 16:45	Brett W Kenyon	1
10398	EDB in Wastewater	SW-846 8011	1	152550010A	09/16/2015 21:04	Richard A Shober	1
07786	EDB Extraction (8011)	SW-846 8011	1	152550010A	09/16/2015 09:00	Roman Kuropatkin	1
12899	DRO/DX Mini-extraction Master	ECY 97-602 NWTPH-Dx modified	1	152550007A	09/16/2015 16:28	Christine E Dolman	1
12907	Mini-extraction DRO DX (water)	ECY 97-602 NWTPH-Dx 06/97	1	152550007A	09/16/2015 02:00	Sherry L Morrow	1
06035	Lead	SW-846 6020	1	152526050004A	09/14/2015 11:13	Choon Y Tian	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	152526050004	09/11/2015 09:22	Katlin N Cataldi	1

*=This limit was used in the evaluation of the final result

Sample Description: **MW-8 Filtered Water**
Former Olympia Bulk Plant COC: R219429
1117 West Bay Drive - Olympia, WA

LL Sample # WW 8036467
LL Group # 1590593
Account # 13255

Project Name: Former Olympia Bulk Plant

Collected: 09/02/2015 19:30 by JL

Submitted: 09/04/2015 09:35
Reported: 09/21/2015 14:19

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
Metals Dissolved	**SW-846 6020**		**ug/l**	**ug/l**	**ug/l**	
06035	Lead	7439-92-1	N.D.	0.13	1.0	1

General Sample Comments

State of Washington Lab Certification No. C457
This sample was filtered in the lab for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06035	Lead	SW-846 6020	1	152526050004A	09/14/2015 11:15	Choon Y Tian	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	152526050004	09/11/2015 09:22	Katlin N Cataldi	1

*=This limit was used in the evaluation of the final result

Sample Description: MW-9 Water
Former Olympia Bulk Plant COC: R219429
1117 West Bay Drive - Olympia, WA

LL Sample # WW 8036468
LL Group # 1590593
Account # 13255

Project Name: Former Olympia Bulk Plant

Collected: 09/02/2015 18:50 by JL

Submitted: 09/04/2015 09:35
Reported: 09/21/2015 14:19

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

OLY09

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**		**ug/l**	**ug/l**	
10335	Benzene	71-43-2	N.D.		0.50	1.0	1
10335	1,2-Dichloroethane	107-06-2	N.D.		0.50	1.0	1
10335	Ethylbenzene	100-41-4	N.D.		0.50	1.0	1
10335	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		0.50	1.0	1
10335	Toluene	108-88-3	N.D.		0.50	1.0	1
10335	Xylene (Total)	1330-20-7	N.D.		0.50	1.0	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**		**ug/l**	**ug/l**	
08357	Benzo(a)anthracene	56-55-3	N.D.		0.010	0.050	1
08357	Benzo(a)pyrene	50-32-8	N.D.		0.010	0.050	1
08357	Benzo(b)fluoranthene	205-99-2	N.D.		0.010	0.050	1
08357	Benzo(k)fluoranthene	207-08-9	N.D.		0.010	0.050	1
08357	Chrysene	218-01-9	N.D.		0.010	0.050	1
08357	Dibenz(a,h)anthracene	53-70-3	N.D.		0.010	0.050	1
08357	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.		0.010	0.050	1
08357	1-Methylnaphthalene	90-12-0	0.12		0.010	0.050	1
08357	2-Methylnaphthalene	91-57-6	0.058		0.010	0.050	1
08357	Naphthalene	91-20-3	0.37		0.030	0.060	1
GC Volatiles	**ECY 97-602 NWTPH-Gx**		**ug/l**		**ug/l**	**ug/l**	
08273	NWTPH-Gx water C7-C12	n.a.	67	J	50	250	1
Pesticides/PCBs	**SW-846 8011**		**ug/l**		**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.		0.0096	0.029	1
GC Petroleum Hydrocarbons	**ECY 97-602 NWTPH-Dx modified**		**ug/l**		**ug/l**	**ug/l**	
12899	DX DRO C12-C24	n.a.	N.D.		45	100	1
12899	DX HRO C24-C40	n.a.	N.D.		100	250	1
Metals	**SW-846 6020**		**ug/l**		**ug/l**	**ug/l**	
06035	Lead	7439-92-1	0.30	J	0.13	1.0	1

General Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	BTEX, MTBE, EDC	SW-846 8260B	1	N152522AA	09/10/2015 04:14	Caitlin M Carmody	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	N152522AA	09/10/2015 04:14	Caitlin M Carmody	1

*=This limit was used in the evaluation of the final result

Sample Description: MW-9 Water
Former Olympia Bulk Plant COC: R219429
1117 West Bay Drive - Olympia, WA

LL Sample # WW 8036468
LL Group # 1590593
Account # 13255

Project Name: Former Olympia Bulk Plant

Collected: 09/02/2015 18:50 by JL

Submitted: 09/04/2015 09:35
Reported: 09/21/2015 14:19

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

OLY09

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	15248WAP026	09/11/2015 20:58	Holly B Ziegler	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	15248WAP026	09/08/2015 17:30	Ryan A Schafran	1
08273	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	15247A94A	09/08/2015 17:10	Brett W Kenyon	1
01146	GC VOA Water Prep	SW-846 5030B	1	15247A94A	09/08/2015 17:10	Brett W Kenyon	1
10398	EDB in Wastewater	SW-846 8011	1	152550010A	09/16/2015 21:20	Richard A Shober	1
07786	EDB Extraction (8011)	SW-846 8011	1	152550010A	09/16/2015 09:00	Roman Kuropatkin	1
12899	DRO/DX Mini-extraction Master	ECY 97-602 NWTPH-Dx modified	1	152550007A	09/16/2015 16:52	Christine E Dolman	1
12907	Mini-extraction DRO DX (water)	ECY 97-602 NWTPH-Dx 06/97	1	152550007A	09/16/2015 02:00	Sherry L Morrow	1
06035	Lead	SW-846 6020	1	152526050004A	09/14/2015 11:17	Choon Y Tian	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	152526050004	09/11/2015 09:22	Katlin N Cataldi	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: MW-9 Filtered Water
Former Olympia Bulk Plant COC: R219429
1117 West Bay Drive - Olympia, WA

LL Sample # WW 8036469
LL Group # 1590593
Account # 13255

Project Name: Former Olympia Bulk Plant

Collected: 09/02/2015 18:50 by JL

Submitted: 09/04/2015 09:35
Reported: 09/21/2015 14:19

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
Metals Dissolved	**SW-846 6020**		**ug/l**	**ug/l**	**ug/l**	
06035	Lead	7439-92-1	N.D.	0.13	1.0	1

General Sample Comments

State of Washington Lab Certification No. C457
This sample was filtered in the lab for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06035	Lead	SW-846 6020	1	152526050004A	09/14/2015 11:19	Choon Y Tian	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	152526050004	09/11/2015 09:22	Katlin N Cataldi	1

*=This limit was used in the evaluation of the final result

Sample Description: MW-10 Water
Former Olympia Bulk Plant COC: R219429
1117 West Bay Drive - Olympia, WA

LL Sample # WW 8036470
LL Group # 1590593
Account # 13255

Project Name: Former Olympia Bulk Plant

Collected: 09/02/2015 18:00 by JL

Submitted: 09/04/2015 09:35
Reported: 09/21/2015 14:19

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Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

OLY10

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	**ug/l**	
10335	Benzene	71-43-2	N.D.	0.50	1.0	1
10335	1,2-Dichloroethane	107-06-2	N.D.	0.50	1.0	1
10335	Ethylbenzene	100-41-4	N.D.	0.50	1.0	1
10335	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	0.50	1.0	1
10335	Toluene	108-88-3	N.D.	0.50	1.0	1
10335	Xylene (Total)	1330-20-7	N.D.	0.50	1.0	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**	**ug/l**	**ug/l**	
08357	Benzo(a)anthracene	56-55-3	N.D.	0.010	0.051	1
08357	Benzo(a)pyrene	50-32-8	N.D.	0.010	0.051	1
08357	Benzo(b)fluoranthene	205-99-2	N.D.	0.010	0.051	1
08357	Benzo(k)fluoranthene	207-08-9	N.D.	0.010	0.051	1
08357	Chrysene	218-01-9	N.D.	0.010	0.051	1
08357	Dibenz(a,h)anthracene	53-70-3	N.D.	0.010	0.051	1
08357	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.010	0.051	1
08357	1-Methylnaphthalene	90-12-0	N.D.	0.010	0.051	1
08357	2-Methylnaphthalene	91-57-6	N.D.	0.010	0.051	1
08357	Naphthalene	91-20-3	N.D.	0.030	0.061	1
GC Volatiles	**ECY 97-602 NWTPH-Gx**		**ug/l**	**ug/l**	**ug/l**	
08273	NWTPH-Gx water C7-C12	n.a.	N.D.	50	250	1
Pesticides/PCBs	**SW-846 8011**		**ug/l**	**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.	0.0094	0.028	1
GC Petroleum Hydrocarbons	**ECY 97-602 NWTPH-Dx modified**		**ug/l**	**ug/l**	**ug/l**	
12899	DX DRO C12-C24	n.a.	N.D.	45	100	1
12899	DX HRO C24-C40	n.a.	N.D.	100	250	1
Metals	**SW-846 6020**		**ug/l**	**ug/l**	**ug/l**	
06035	Lead	7439-92-1	2.1	0.13	1.0	1

General Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	BTEX, MTBE, EDC	SW-846 8260B	1	N152522AA	09/10/2015 04:37	Caitlin M Carmody	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	N152522AA	09/10/2015 04:37	Caitlin M Carmody	1

*=This limit was used in the evaluation of the final result

Sample Description: MW-10 Water
Former Olympia Bulk Plant COC: R219429
1117 West Bay Drive - Olympia, WA

LL Sample # WW 8036470
LL Group # 1590593
Account # 13255

Project Name: Former Olympia Bulk Plant

Collected: 09/02/2015 18:00 by JL

Submitted: 09/04/2015 09:35
Reported: 09/21/2015 14:19

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Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

OLY10

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	15248WAP026	09/14/2015 16:05	Holly B Ziegler	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	15248WAP026	09/08/2015 17:30	Ryan A Schafran	1
08273	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	15247A94A	09/08/2015 17:35	Brett W Kenyon	1
01146	GC VOA Water Prep	SW-846 5030B	1	15247A94A	09/08/2015 17:35	Brett W Kenyon	1
10398	EDB in Wastewater	SW-846 8011	1	152550010A	09/16/2015 21:36	Richard A Shober	1
07786	EDB Extraction (8011)	SW-846 8011	1	152550010A	09/16/2015 09:00	Roman Kuropatkin	1
12899	DRO/DX Mini-extraction Master	ECY 97-602 NWTPH-Dx modified	1	152550007A	09/16/2015 17:39	Christine E Dolman	1
12907	Mini-extraction DRO DX (water)	ECY 97-602 NWTPH-Dx 06/97	1	152550007A	09/16/2015 02:00	Sherry L Morrow	1
06035	Lead	SW-846 6020	1	152526050004A	09/14/2015 11:20	Choon Y Tian	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	152526050004	09/11/2015 09:22	Katlin N Cataldi	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: MW-10 Filtered Water
Former Olympia Bulk Plant COC: R219429
1117 West Bay Drive - Olympia, WA

LL Sample # WW 8036471
LL Group # 1590593
Account # 13255

Project Name: Former Olympia Bulk Plant

Collected: 09/02/2015 18:00 by JL

Submitted: 09/04/2015 09:35
Reported: 09/21/2015 14:19

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Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
Metals Dissolved	**SW-846 6020**		**ug/l**		**ug/l**	**ug/l**	
06035	Lead	7439-92-1	0.15	J	0.13	1.0	1

General Sample Comments

State of Washington Lab Certification No. C457
This sample was filtered in the lab for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06035	Lead	SW-846 6020	1	152526050004A	09/14/2015 11:22	Choon Y Tian	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	152526050004	09/11/2015 09:22	Katlin N Cataldi	1

*=This limit was used in the evaluation of the final result

Sample Description: MW-11 Water
Former Olympia Bulk Plant COC: R219429
1117 West Bay Drive - Olympia, WA

LL Sample # WW 8036472
LL Group # 1590593
Account # 13255

Project Name: Former Olympia Bulk Plant

Collected: 09/02/2015 17:25 by JL

Submitted: 09/04/2015 09:35
Reported: 09/21/2015 14:19

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OLY11

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**		**ug/l**	**ug/l**	
10335	Benzene	71-43-2	N.D.		0.50	1.0	1
10335	1,2-Dichloroethane	107-06-2	N.D.		0.50	1.0	1
10335	Ethylbenzene	100-41-4	N.D.		0.50	1.0	1
10335	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		0.50	1.0	1
10335	Toluene	108-88-3	N.D.		0.50	1.0	1
10335	Xylene (Total)	1330-20-7	N.D.		0.50	1.0	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**		**ug/l**	**ug/l**	
08357	Benzo(a)anthracene	56-55-3	N.D.		0.010	0.050	1
08357	Benzo(a)pyrene	50-32-8	N.D.		0.010	0.050	1
08357	Benzo(b)fluoranthene	205-99-2	N.D.		0.010	0.050	1
08357	Benzo(k)fluoranthene	207-08-9	N.D.		0.010	0.050	1
08357	Chrysene	218-01-9	N.D.		0.010	0.050	1
08357	Dibenz(a,h)anthracene	53-70-3	N.D.		0.010	0.050	1
08357	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.		0.010	0.050	1
08357	1-Methylnaphthalene	90-12-0	N.D.		0.010	0.050	1
08357	2-Methylnaphthalene	91-57-6	N.D.		0.010	0.050	1
08357	Naphthalene	91-20-3	N.D.		0.030	0.060	1
GC Volatiles	**ECY 97-602 NWTPH-Gx**		**ug/l**		**ug/l**	**ug/l**	
08273	NWTPH-Gx water C7-C12	n.a.	N.D.		50	250	1
Pesticides/PCBs	**SW-846 8011**		**ug/l**		**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.		0.0096	0.029	1
GC Petroleum Hydrocarbons	**ECY 97-602 NWTPH-Dx modified**		**ug/l**		**ug/l**	**ug/l**	
12899	DX DRO C12-C24	n.a.	N.D.		48	110	1
12899	DX HRO C24-C40	n.a.	N.D.		110	270	1
Metals	**SW-846 6020**		**ug/l**		**ug/l**	**ug/l**	
06035	Lead	7439-92-1	0.87	J	0.13	1.0	1

General Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	BTEX, MTBE, EDC	SW-846 8260B	1	N152522AA	09/10/2015 05:00	Caitlin M Carmody	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	N152522AA	09/10/2015 05:00	Caitlin M Carmody	1

*=This limit was used in the evaluation of the final result

Sample Description: MW-11 Water
Former Olympia Bulk Plant COC: R219429
1117 West Bay Drive - Olympia, WA

LL Sample # WW 8036472
LL Group # 1590593
Account # 13255

Project Name: Former Olympia Bulk Plant

Collected: 09/02/2015 17:25 by JL

Submitted: 09/04/2015 09:35
Reported: 09/21/2015 14:19

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Highlands Ranch CO 80129

OLY11

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	15248WAP026	09/14/2015 16:33	Holly B Ziegler	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	15248WAP026	09/08/2015 17:30	Ryan A Schafran	1
08273	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	15247A94A	09/08/2015 18:00	Brett W Kenyon	1
01146	GC VOA Water Prep	SW-846 5030B	1	15247A94A	09/08/2015 18:00	Brett W Kenyon	1
10398	EDB in Wastewater	SW-846 8011	1	152550010A	09/16/2015 21:52	Richard A Shober	1
07786	EDB Extraction (8011)	SW-846 8011	1	152550010A	09/16/2015 09:00	Roman Kuropatkin	1
12899	DRO/DX Mini-extraction Master	ECY 97-602 NWTPH-Dx modified	1	152550007A	09/16/2015 18:02	Christine E Dolman	1
12907	Mini-extraction DRO DX (water)	ECY 97-602 NWTPH-Dx 06/97	1	152550007A	09/16/2015 02:00	Sherry L Morrow	1
06035	Lead	SW-846 6020	1	152526050004A	09/14/2015 11:31	Choon Y Tian	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	152526050004	09/11/2015 09:22	Katlin N Cataldi	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: MW-11 Filtered Water
Former Olympia Bulk Plant COC: R219429
1117 West Bay Drive - Olympia, WA

LL Sample # WW 8036473
LL Group # 1590593
Account # 13255

Project Name: Former Olympia Bulk Plant

Collected: 09/02/2015 17:25 by JL

Submitted: 09/04/2015 09:35
Reported: 09/21/2015 14:19

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
Metals Dissolved	**SW-846 6020**		**ug/l**	**ug/l**	**ug/l**	
06035	Lead	7439-92-1	N.D.	0.13	1.0	1

General Sample Comments

State of Washington Lab Certification No. C457
This sample was filtered in the lab for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06035	Lead	SW-846 6020	1	152526050004A	09/14/2015 11:33	Choon Y Tian	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	152526050004	09/11/2015 09:22	Katlin N Cataldi	1

*=This limit was used in the evaluation of the final result

Sample Description: MW-12 Water
Former Olympia Bulk Plant COC: R219429
1117 West Bay Drive - Olympia, WA

LL Sample # WW 8036474
LL Group # 1590593
Account # 13255

Project Name: Former Olympia Bulk Plant

Collected: 09/02/2015 16:20 by JL

Submitted: 09/04/2015 09:35
Reported: 09/21/2015 14:19

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

OLY12

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	**ug/l**	
10335	Benzene	71-43-2	N.D.	0.50	1.0	1
10335	1,2-Dichloroethane	107-06-2	N.D.	0.50	1.0	1
10335	Ethylbenzene	100-41-4	N.D.	0.50	1.0	1
10335	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	0.50	1.0	1
10335	Toluene	108-88-3	N.D.	0.50	1.0	1
10335	Xylene (Total)	1330-20-7	N.D.	0.50	1.0	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**	**ug/l**	**ug/l**	
08357	Benzo(a)anthracene	56-55-3	N.D.	0.010	0.050	1
08357	Benzo(a)pyrene	50-32-8	N.D.	0.010	0.050	1
08357	Benzo(b)fluoranthene	205-99-2	N.D.	0.010	0.050	1
08357	Benzo(k)fluoranthene	207-08-9	N.D.	0.010	0.050	1
08357	Chrysene	218-01-9	N.D.	0.010	0.050	1
08357	Dibenz(a,h)anthracene	53-70-3	N.D.	0.010	0.050	1
08357	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.010	0.050	1
08357	1-Methylnaphthalene	90-12-0	N.D.	0.010	0.050	1
08357	2-Methylnaphthalene	91-57-6	N.D.	0.010	0.050	1
08357	Naphthalene	91-20-3	N.D.	0.030	0.060	1
GC Volatiles	**ECY 97-602 NWTPH-Gx**		**ug/l**	**ug/l**	**ug/l**	
08273	NWTPH-Gx water C7-C12	n.a.	N.D.	50	250	1
Pesticides/PCBs	**SW-846 8011**		**ug/l**	**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.	0.0096	0.029	1
GC Petroleum Hydrocarbons	**ECY 97-602 NWTPH-Dx modified**		**ug/l**	**ug/l**	**ug/l**	
12899	DX DRO C12-C24	n.a.	N.D.	48	110	1
12899	DX HRO C24-C40	n.a.	N.D.	110	270	1
Metals	**SW-846 6020**		**ug/l**	**ug/l**	**ug/l**	
06035	Lead	7439-92-1	N.D.	0.13	1.0	1

General Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	BTEX, MTBE, EDC	SW-846 8260B	1	N152522AA	09/10/2015 05:24	Caitlin M Carmody	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	N152522AA	09/10/2015 05:24	Caitlin M Carmody	1

*=This limit was used in the evaluation of the final result

Sample Description: MW-12 Water
Former Olympia Bulk Plant COC: R219429
1117 West Bay Drive - Olympia, WA

LL Sample # WW 8036474
LL Group # 1590593
Account # 13255

Project Name: Former Olympia Bulk Plant

Collected: 09/02/2015 16:20 by JL

Submitted: 09/04/2015 09:35
Reported: 09/21/2015 14:19

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

OLY12

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	15248WAP026	09/14/2015 17:01	Holly B Ziegler	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	15248WAP026	09/08/2015 17:30	Ryan A Schafran	1
08273	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	15247A94A	09/08/2015 18:26	Brett W Kenyon	1
01146	GC VOA Water Prep	SW-846 5030B	1	15247A94A	09/08/2015 18:26	Brett W Kenyon	1
10398	EDB in Wastewater	SW-846 8011	1	152550010A	09/16/2015 22:07	Richard A Shober	1
07786	EDB Extraction (8011)	SW-846 8011	1	152550010A	09/16/2015 09:00	Roman Kuropatkin	1
12899	DRO/DX Mini-extraction Master	ECY 97-602 NWTPH-Dx modified	1	152550007A	09/16/2015 18:26	Christine E Dolman	1
12907	Mini-extraction DRO DX (water)	ECY 97-602 NWTPH-Dx 06/97	1	152550007A	09/16/2015 02:00	Sherry L Morrow	1
06035	Lead	SW-846 6020	1	152526050004A	09/14/2015 11:35	Choon Y Tian	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	152526050004	09/11/2015 09:22	Katlin N Cataldi	1

*=This limit was used in the evaluation of the final result

Sample Description: **MW-12 Filtered Water**
Former Olympia Bulk Plant COC: R219429
1117 West Bay Drive - Olympia, WA

LL Sample # WW 8036475
LL Group # 1590593
Account # 13255

Project Name: Former Olympia Bulk Plant

Collected: 09/02/2015 16:20 by JL

Submitted: 09/04/2015 09:35
Reported: 09/21/2015 14:19

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
Metals Dissolved	**SW-846 6020**		**ug/l**	**ug/l**	**ug/l**	
06035	Lead	7439-92-1	N.D.	0.13	1.0	1

General Sample Comments

State of Washington Lab Certification No. C457
This sample was filtered in the lab for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06035	Lead	SW-846 6020	1	152526050004A	09/14/2015 11:37	Choon Y Tian	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	152526050004	09/11/2015 09:22	Katlin N Cataldi	1

*=This limit was used in the evaluation of the final result

Sample Description: DUP-1 Water
Former Olympia Bulk Plant COC: R219429
1117 West Bay Drive - Olympia, WA

LL Sample # WW 8036476
LL Group # 1590593
Account # 13255

Project Name: Former Olympia Bulk Plant

Collected: 09/02/2015 by JL

Submitted: 09/04/2015 09:35
Reported: 09/21/2015 14:19

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

OLYFD

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	**ug/l**	
10335	Benzene	71-43-2	N.D.	0.50	1.0	1
10335	1,2-Dichloroethane	107-06-2	N.D.	0.50	1.0	1
10335	Ethylbenzene	100-41-4	N.D.	0.50	1.0	1
10335	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	0.50	1.0	1
10335	Toluene	108-88-3	N.D.	0.50	1.0	1
10335	Xylene (Total)	1330-20-7	N.D.	0.50	1.0	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**	**ug/l**	**ug/l**	
08357	Benzo(a)anthracene	56-55-3	N.D.	0.010	0.051	1
08357	Benzo(a)pyrene	50-32-8	N.D.	0.010	0.051	1
08357	Benzo(b)fluoranthene	205-99-2	N.D.	0.010	0.051	1
08357	Benzo(k)fluoranthene	207-08-9	N.D.	0.010	0.051	1
08357	Chrysene	218-01-9	N.D.	0.010	0.051	1
08357	Dibenz(a,h)anthracene	53-70-3	N.D.	0.010	0.051	1
08357	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.010	0.051	1
08357	1-Methylnaphthalene	90-12-0	0.21	0.010	0.051	1
08357	2-Methylnaphthalene	91-57-6	0.18	0.010	0.051	1
08357	Naphthalene	91-20-3	0.088	0.030	0.061	1
GC Volatiles	**ECY 97-602 NWTPH-Gx**		**ug/l**	**ug/l**	**ug/l**	
08273	NWTPH-Gx water C7-C12	n.a.	N.D.	50	250	1
Pesticides/PCBs	**SW-846 8011**		**ug/l**	**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.	0.0094	0.028	1
GC Petroleum Hydrocarbons	**ECY 97-602 NWTPH-Dx modified**		**ug/l**	**ug/l**	**ug/l**	
12899	DX DRO C12-C24	n.a.	110	45	100	1
12899	DX HRO C24-C40	n.a.	N.D.	100	250	1
Metals	**SW-846 6020**		**ug/l**	**ug/l**	**ug/l**	
06035	Lead	7439-92-1	N.D.	0.13	1.0	1

General Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	BTEX, MTBE, EDC	SW-846 8260B	1	N152522AA	09/10/2015 05:47	Caitlin M Carmody	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	N152522AA	09/10/2015 05:47	Caitlin M Carmody	1

*=This limit was used in the evaluation of the final result

Sample Description: DUP-1 Water
Former Olympia Bulk Plant COC: R219429
1117 West Bay Drive - Olympia, WA

LL Sample # WW 8036476
LL Group # 1590593
Account # 13255

Project Name: Former Olympia Bulk Plant

Collected: 09/02/2015 by JL

Submitted: 09/04/2015 09:35
Reported: 09/21/2015 14:19

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

OLYFD

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	15248WAP026	09/14/2015 17:29	Holly B Ziegler	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	15248WAP026	09/08/2015 17:30	Ryan A Schafran	1
08273	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	15247A94A	09/08/2015 18:51	Brett W Kenyon	1
01146	GC VOA Water Prep	SW-846 5030B	1	15247A94A	09/08/2015 18:51	Brett W Kenyon	1
10398	EDB in Wastewater	SW-846 8011	1	152550010A	09/16/2015 22:55	Richard A Shober	1
07786	EDB Extraction (8011)	SW-846 8011	1	152550010A	09/16/2015 09:00	Roman Kuropatkin	1
12899	DRO/DX Mini-extraction Master	ECY 97-602 NWTPH-Dx modified	1	152550007A	09/16/2015 18:49	Christine E Dolman	1
12907	Mini-extraction DRO DX (water)	ECY 97-602 NWTPH-Dx 06/97	1	152550007A	09/16/2015 02:00	Sherry L Morrow	1
06035	Lead	SW-846 6020	1	152526050004A	09/14/2015 11:28	Choon Y Tian	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	152526050004	09/11/2015 09:22	Katlin N Cataldi	1

*=This limit was used in the evaluation of the final result

Sample Description: DUP-1 Filtered Water
Former Olympia Bulk Plant COC: R219429
1117 West Bay Drive - Olympia, WA

LL Sample # WW 8036477
LL Group # 1590593
Account # 13255

Project Name: Former Olympia Bulk Plant

Collected: 09/02/2015 by JL

Submitted: 09/04/2015 09:35
Reported: 09/21/2015 14:19

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
Metals Dissolved	**SW-846 6020**		**ug/l**	**ug/l**	**ug/l**	
06035	Lead	7439-92-1	N.D.	0.13	1.0	1

General Sample Comments

State of Washington Lab Certification No. C457
This sample was filtered in the lab for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06035	Lead	SW-846 6020	1	152526050004A	09/14/2015 11:29	Choon Y Tian	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	152526050004	09/11/2015 09:22	Katlin N Cataldi	1

*=This limit was used in the evaluation of the final result

Sample Description: TRIP-BLANK Water
Former Olympia Bulk Plant COC: R219429
1117 West Bay Drive - Olympia, WA

LL Sample # WW 8036478
LL Group # 1590593
Account # 13255

Project Name: Former Olympia Bulk Plant

Collected: 09/02/2015

Submitted: 09/04/2015 09:35
Reported: 09/21/2015 14:19

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

TBOLY

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	**ug/l**	
10335	Benzene	71-43-2	N.D.	0.50	1.0	1
10335	1,2-Dichloroethane	107-06-2	N.D.	0.50	1.0	1
10335	Ethylbenzene	100-41-4	N.D.	0.50	1.0	1
10335	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	0.50	1.0	1
10335	Toluene	108-88-3	N.D.	0.50	1.0	1
10335	Xylene (Total)	1330-20-7	N.D.	0.50	1.0	1
GC Volatiles	**ECY 97-602 NWTPH-Gx**		**ug/l**	**ug/l**	**ug/l**	
08273	NWTPH-Gx water C7-C12	n.a.	N.D.	50	250	1

General Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	BTEX, MTBE, EDC	SW-846 8260B	1	N152522AA	09/10/2015 06:10	Caitlin M Carmody	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	N152522AA	09/10/2015 06:10	Caitlin M Carmody	1
08273	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	15247A94A	09/08/2015 13:22	Brett W Kenyon	1
01146	GC VOA Water Prep	SW-846 5030B	1	15247A94A	09/08/2015 13:22	Brett W Kenyon	1

*=This limit was used in the evaluation of the final result

Quality Control Summary

Client Name: Atlantic Richfield c/o ARCADIS Group Number: 1590593
Reported: 09/21/2015 14:19

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Laboratory Compliance Quality Control

Analysis Name	Blank Result	Blank MDL**	Blank LOQ	Report Units	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: N152522AA	Sample number(s): 8036462,8036464,8036466,8036468,8036470,8036472,8036474,8036476,8036478								
Benzene	N.D.	0.50	1.0	ug/l	109	111	78-120	2	30
1,2-Dichloroethane	N.D.	0.50	1.0	ug/l	111	113	72-127	2	30
Ethylbenzene	N.D.	0.50	1.0	ug/l	98	98	78-120	1	30
Methyl Tertiary Butyl Ether	N.D.	0.50	1.0	ug/l	107	109	75-120	2	30
Toluene	N.D.	0.50	1.0	ug/l	95	96	80-120	1	30
Xylene (Total)	N.D.	0.50	1.0	ug/l	92	93	80-120	1	30
Batch number: 15248WAP026	Sample number(s): 8036462,8036464,8036466,8036468,8036470,8036472,8036474,8036476								
Benzo(a)anthracene	N.D.	0.010	0.050	ug/l	98	96	76-119	2	30
Benzo(a)pyrene	N.D.	0.010	0.050	ug/l	99	98	70-120	1	30
Benzo(b)fluoranthene	N.D.	0.010	0.050	ug/l	109	110	76-132	0	30
Benzo(k)fluoranthene	N.D.	0.010	0.050	ug/l	99	97	69-126	2	30
Chrysene	N.D.	0.010	0.050	ug/l	95	94	76-121	2	30
Dibenz(a,h)anthracene	N.D.	0.010	0.050	ug/l	98	101	47-136	3	30
Indeno(1,2,3-cd)pyrene	N.D.	0.010	0.050	ug/l	97	99	56-129	1	30
1-Methylnaphthalene	N.D.	0.010	0.050	ug/l	95	96	65-122	2	30
2-Methylnaphthalene	N.D.	0.010	0.050	ug/l	95	98	59-124	3	30
Naphthalene	N.D.	0.030	0.060	ug/l	90	93	60-122	4	30
Batch number: 15247A94A	Sample number(s): 8036462,8036464,8036466,8036468,8036470,8036472,8036474,8036476,8036478								
NWTPH-Gx water C7-C12	N.D.	50.	250	ug/l	90	93	80-123	4	30
Batch number: 152550010A	Sample number(s): 8036462,8036464,8036466,8036468,8036470,8036472,8036474,8036476								
Ethylene dibromide	N.D.	0.010	0.030	ug/l	109	92	60-140	17	20
Batch number: 152550007A	Sample number(s): 8036462,8036464,8036466,8036468,8036470,8036472,8036474,8036476								
DX DRO C12-C24	N.D.	45.	100	ug/l	51	57	50-113	10	20
DX HRO C24-C40	N.D.	100.	250	ug/l					
Batch number: 152526050004A	Sample number(s): 8036462-8036477								
Lead	N.D.	0.13	1.0	ug/l	102		80-120		

Sample Matrix Quality Control

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

Quality Control Summary

Client Name: Atlantic Richfield c/o ARCADIS Group Number: 1590593
Reported: 09/21/2015 14:19
Unspiked (UNSPK) = the sample used in conjunction with the matrix spike
Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD MAX	BKG Conc	DUP Conc	DUP RPD	Dup RPD Max
Batch number: N152522AA	Sample number(s): 8036462,8036464,8036466,8036468,8036470,8036472,8036474,8036476,8036478 UNSPK: P026767								
Benzene	117	116	78-120	1	30				
1,2-Dichloroethane	117	116	72-127	1	30				
Ethylbenzene	105	103	78-120	2	30				
Methyl Tertiary Butyl Ether	109	109	75-120	1	30				
Toluene	102	101	80-120	1	30				
Xylene (Total)	98	98	80-120	1	30				
Batch number: 152550010A	Sample number(s): 8036462,8036464,8036466,8036468,8036470,8036472,8036474,8036476 UNSPK: 8036462 BKG: 8036464								
Ethylene dibromide	105		60-140			N.D.	N.D.	0 (1)	30
Batch number: 152526050004A	Sample number(s): 8036462-8036477 UNSPK: 8036464 BKG: 8036464								
Lead	106	106	75-125	1	20	N.D.	N.D.	0 (1)	20

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: BTEX, MTBE, EDC
Batch number: N152522AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8036462	103	101	92	99
8036464	103	102	92	100
8036466	102	101	92	99
8036468	104	103	92	99
8036470	104	103	92	99
8036472	103	102	92	98
8036474	105	100	92	99
8036476	104	103	92	98
8036478	105	104	92	99
Blank	102	101	93	102
LCS	103	100	95	102
LCSD	105	99	95	102
MS	104	101	96	103
MSD	104	101	94	102
Limits:	80-116	77-113	80-113	78-113

Analysis Name: PAHs in waters by SIM
Batch number: 15248WAP026

	Fluoranthene-d10	Benzo(a)pyrene-d12	1-Methylnaphthalene-d10
8036462	99	98	90
8036464	86	101	92
8036466	81	83	91

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

Quality Control Summary

Client Name: Atlantic Richfield c/o ARCADIS Group Number: 1590593
Reported: 09/21/2015 14:19

Surrogate Quality Control

8036468	91	83	90
8036470	92	82	85
8036472	80	78	79
8036474	84	87	75
8036476	64	74	67
Blank	89	89	75
LCS	96	99	87
LCSD	97	103	90
Limits:	56-134	44-149	52-127

Analysis Name: NWTPH-Gx water C7-C12
Batch number: 15247A94A

	Trifluorotoluene-F
8036462	76
8036464	76
8036466	76
8036468	77
8036470	76
8036472	76
8036474	75
8036476	77
8036478	76
Blank	76
LCS	97
LCSD	95
Limits:	63-135

Analysis Name: EDB in Wastewater
Batch number: 152550010A

	1,1,2,2-Tetrachloroethane
8036462	105
8036464	118
8036466	123
8036468	121
8036470	116
8036472	109
8036474	123
8036476	124
Blank	122
DUP	113
LCS	112
LCSD	107
MS	103
Limits:	46-136

Analysis Name: DRO/DX Mini-extraction Master
Batch number: 152550007A

	Orthoterphenyl
8036462	82
8036464	61
8036466	62
8036468	78
8036470	80
8036472	84

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

Quality Control Summary

Client Name: Atlantic Richfield c/o ARCADIS Group Number: 1590593
Reported: 09/21/2015 14:19

Surrogate Quality Control

8036474	80
8036476	64
Blank	80
LCS	75
LCSD	78
Limits:	50-150

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

13255 1590593 8036462-78

bp rm Laboratory Management Program LaMP — Chain of Custody Record R219429

Page 1 of 1

BP Site Node Path: _____ Req Due Date (mm/dd/yy): Standard TAT Rush TAT: Yes ___ No ___

BP Facility No: Former Olympia Bulk Plant Lab Work Order Number: _____

Lab Name: Lancaster Laboratories	Facility Address: 1117 W Bay Drive	Consultant/Contractor: Arcadis
Lab Address: 2425 New Holland Pike Lancaster, PA	City, State, ZIP Code: Olympia, WA	Consultant/Contractor Project No: 30090004.WA.WA01
Lab PM: Stacy Britt	Lead Regulatory Agency: WADOE	Address: 1100 Olive Way
Lab Phone: 717-656-2300	California Global ID No.: —	Consultant/Contractor PM: Brian Marcus
Lab Shipping Accnt: —	Enfos Proposal No: —	Phone: 206-726-4578 Email: Brian.Marcus@arcadis-us.com
Lab Bottle Order No: —	Accounting Mode: Provision ___ OOC-BU ___ OOC-RM ___	Email EDD To: Brian Marcus and to lab.enfosdoc@bp.com
Other Info: —	Stage: Activity:	Invoice To: BP ___ Contractor ✓

BP Project Manager (PM):

BP PM Phone:

BP PM Email:

Lab No.	Sample Description	Date	Time	Matrix: Soil / Solid	Matrix: Water / Liquid	Matrix: Air / Vapor	Matrix: Is this location a well?	No. Containers / Preservative: Total Number of Containers	Unpreserved	H2SO4	HNO3	HCl	Methanol	Requested Analyses: total Lead	NWTPH-Gx	NWTPH-Dx/HO	BTEX MTBE EDC	EDB by 8011	PAHs by 8270C SIM	dissolved lead
	MW-6R	9-2-15	1515		✓			14	3		1	10		✓	✓	—	—	—	—	✓
	MW-7	↓	2030		✓			14	3		1	10		✓	✓	—	—	—	—	✓
	MW-8		1930		✓			14	3		1	10		✓	✓	—	—	—	—	✓
	MW-9		1850		✓			14	3		1	10		✓	✓	—	—	—	—	✓
	MW-10		1800		✓			14	3		1	10		✓	✓	—	—	—	—	✓
	MW-11		1725		✓			14	3		1	10		✓	✓	—	—	—	—	✓
	MW-12	↓	1620		✓			14	3		1	10		✓	✓	—	—	—	—	✓
	DUP-1		—		✓			14	3		1	10		✓	✓	—	—	—	—	✓
	TRIP-BLANK	↓	—		✓			2			0	2		✓	✓	—	—	—	—	✓

Report Type & QC Level

Standard ___

Full Data Package ___

Comments

Note: If sample not collected, indicate "No Sample" in comments and single-strike out and initial any preprinted sample description.

Sampler's Name: Jason Little	Relinquished By / Affiliation	Date	Time	Accepted By / Affiliation	Date	Time
Sampler's Company: Arcadis	Arcadis					
Shipment Method: UPS Next Day Ship Date: 9-3-15						
Shipment Tracking No:					9/4/15	935

Special Instructions:

THIS LINE - LAB USE ONLY: Custody Seals In Place: (Yes) / No | Temp Blank: (Yes) / No | Cooler Temp on Receipt: 1.4-1.9 °F/C | Trip Blank: (Yes) / No | MS/MSD Sample Submitted: Yes / (No)

eurofins | Lancaster Laboratories Environmental

Sample Administration Receipt Documentation Log

Doc Log ID: 102838

Group Number(s): 1540593

Client: Arcadis

Delivery and Receipt Information

Delivery Method:	UPS	Arrival Timestamp:	09/04/2015 9:35
Number of Packages:	2	Number of Projects:	1
State/Province of Origin:	WA		

Arrival Condition Summary

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	Yes	Sample Date/Times match COC:	No
Custody Seal Intact:	Yes	VOA Vial Headspace ≥ 6mm:	No
Samples Chilled:	Yes	Total Trip Blank Qty:	4
Paperwork Enclosed:	Yes	Trip Blank Type:	HCl
Samples Intact:	Yes	Air Quality Samples Present:	No
Missing Samples:	No		
Extra Samples:	No		
Discrepancy in Container Qty on COC:	No		

Unpacked by Wesley Miller (2308) at 15:03 on 09/04/2015

Samples Chilled Details

Thermometer Types: DT = Digital (Temp. Bottle) IR = Infrared (Surface Temp) All Temperatures in °C.

Cooler #	Thermometer ID	Corrected Temp	Therm. Type	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT121	1.4	DT	Wet	Y	Bagged	N
2	DT121	1.9	DT	Wet	Y	Bagged	N

Sample Date/Time Discrepancy Details

Sample ID on COC	Date/Time on Label	Comments
MW-9	9/02/2015 16:50	

2425 New Holland Pike
Lancaster, PA 17605-2425
T 717-656-2300
F 717-656-2681
www.LancasterLabs.com

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

RL	Reporting Limit	**BMQL**	Below Minimum Quantitation Level
N.D.	none detected	**MPN**	Most Probable Number
TNTC	Too Numerous To Count	**CP Units**	cobalt-chloroplatinate units
IU	International Units	**NTU**	nephelometric turbidity units
umhos/cm	micromhos/cm	**ng**	nanogram(s)
C	degrees Celsius	**F**	degrees Fahrenheit
meq	milliequivalents	**lb.**	pound(s)
g	gram(s)	**kg**	kilogram(s)
µg	microgram(s)	**mg**	milligram(s)
mL	milliliter(s)	**L**	liter(s)
m3	cubic meter(s)	**µL**	microliter(s)
		pg/L	picogram/liter

<	less than
>	greater than
ppm	parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.
ppb	parts per billion
Dry weight basis	Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.

Laboratory Data Qualifiers:

B - Analyte detected in the blank
C - Result confirmed by reanalysis
E - Concentration exceeds the calibration range
J (or G, I, X) - estimated value ≥ the Method Detection Limit (MDL or DL) and the < Limit of Quantitation (LOQ or RL)
P - Concentration difference between the primary and confirmation column >40%. The lower result is reported.
U - Analyte was not detected at the value indicated
V - Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference…

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods.
Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, ISO17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as “analyze immediately” are not performed within 15 minutes.

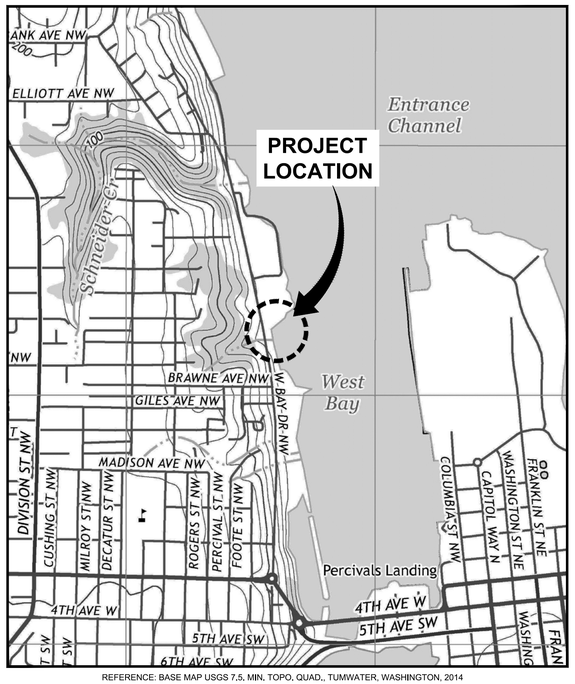
WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

APPENDIX E

Construction Plans and Specifications

CONTRACT DRAWINGS

FORMER INDUSTRIAL PETROLEUM DISTRIBUTORS BULK TERMINAL OLYMPIA, WASHINGTON



REFERENCE: BASE MAP USGS 7.5. MIN, TOPO, QUAD., TUMWATER, WASHINGTON, 2014

LOCATION MAP

0 1000' 2000'

GRAPHIC SCALE

WASHINGTON

1120 WEST BAY DRIVE NORTHWEST OLYMPIA, WASHINGTON

SEPTEMBER 2016

ARCADIS Design & Consultancy for natural and built assets

ARCADIS U.S., INC.

KEY CONTACTS:

ENGINEER:
ARCADIS U.S., INC.
1100 OLIVE WAY, SUITE 800
SEATTLE, WA 98101
TELEPHONE: 206.726.4726

CONTACT: CARSTEN BECKER, PE

INDEX TO DRAWINGS

GENERAL NOTES

1. THE TERM "SITE", AS USED IN THESE DRAWINGS, REFERS TO THE FACILITY LOCATED AT 1120 WEST BAY DRIVE NORTHWEST, OLYMPIA, WASHINGTON.

2. "CONTRACTOR" REFERES TO ALL CONTRACTORS RESPONSIBLE FOR COMPLETION OF THE ACTIVITES SHOWN HEREIN. "ENGINEER" REFERS TO ARCADIS U.S., INC.

3. PRIOR TO CONTRACTOR MOBILIZATION, ALL CONTRACTOR PERSONNEL THAT WILL BE ON-SITE, INCLUDING ALL SUBCONTRACTORS, SHALL READ AND UNDERSTAND THE CURRENT PROJECT HEALTH AND SAFETY PLAN (HASP). ALL PERSONNEL SHALL SIGN A CERTIFICATION STATEMENT INDICATING THAT THEY HAVE READ THE HASP, UNDERSTAND ITS CONTENTS, AND SHALL ADHERE TO ALL PROCEEDURES CONTAINED THEREIN.

4. CONTRACTOR ACTIVITIES SHALL BE PERFORMED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HASP.

5. IN THE EVENT AN UNSAFE CONDITION IS DETECTED BY THE CONTRACTOR, SUBCONTRACTOR OR THE ENGINEER, ALL WORK IN THE AREA OF THE UNSAFE CONDITION SHALL BE STOPPED IMMEDIATELY. THE UNSAFE CONDITION SHALL BE RESOLVED BASED ON THE PROVISIONS OF THE HASP.

6. EXISTING SITE FEATURES THAT ARE DAMAGED OR DESTROYED (OTHER THAN THOSE FEATURES SPECIFICALLY INDICATED ON THESE DRAWINGS TO BE REMOVED OR ALTERED) BY THE CONTRACTOR DURING THE COURSE OF THE PROJECT SHALL BE REPAIRED OR REPLACED BY THE CONTRACTOR TO THE SATISFACTION OF THE ENGINEER – AT THE CONTRACTOR'S OWN EXPENSE.

7. CONTRACTOR SHALL INSTALL AND MAINTAIN TEMPORARY TRAFFIC CONTROL DEVICES ADJACENT TO AND WITHIN THE PROJECT AS REQUIRED BY THE TRAFFIC CONTROL PLAN IN THE HASP AND/OR FEDERAL AND STATE AND LOCAL REGULATIONS.

8. ALL NECESSARY CONSTRUCTION PERMITS AND INSPECTION SHALL BE OBTAINED AND PAID FOR BY THE CONTRACTOR.

9. CONTRACTOR SHALL CONFIRM A CONSTRUCTION SCHEDULE WITH THE ENGINEER AT LEAST 72-HOURS PRIOR TO ANY WORK AT THE SITE. THE PROPOSED SCHEDULE SHALL INCLUDE ESTIMATED START DATE, DURATION, AND COMPLETION TIMES FOR EACH INCLUDED ACTIVITY. CHANGES TO THIS SCHEDULE SHALL BE COMMUNICATED WITH THE ENGINEER WITHIN 24-HOURS.

10. CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING ONE CALL (WASHINGTON UTILITY NOTIFICATION CENTER) AT 800-424-5555 PRIOR TO EXCAVATING. CONTRACTOR SHALL ALLOW SUFFICIENT TIME FOR UTILITIES TO BE MARKED. DO NOT EXCAVATE BEFORE ALL UTILITIES ARE MARKED.

11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING UTILITIES EXCEPT FOR THOSE CALLED OUT TO BE DEMOLISHED AND REPLACED IN THESE DRAWINGS.

12. CONTRACTOR WILL SECURE THE SERVICES OF AN APPROPRIATELY QUALIFIED UTILITY LOCATOR TO LOCATE AND IDENTIFY SUBSURFACE UTILITIES AND OBSTRUCTIONS. UTILITIES AND THEIR LOCATIONS ON THESE DRAWINGS ARE APPROXIMATE.

13. MEASURES SHALL BE TAKEN BY THE CONTRACTOR TO PROTECT ADJACENT AREAS AND PROPERTIES, PUBLIC AND PRIVATE, AT ALL TIMES DURING CONSTRUCTION.

14. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING ALL FIELD DIMENSIONS AND ALL SITE CONDITIONS BEFORE STARTING WORK.

SITE PREPARATION

1. OPEN EXCAVATION AREAS SHALL BE CLEARLY MARK WITH CONSTRUCTION TAPE OR SURROUNDED BY TEMPORARY CHAIN LINK FENCING AFTER WORK HOURS.

2. ENTRANCE GATE SHALL BE SECURED OR BARRICADED WITH 48-INCH ORANGE SAFETY CONES WHEN NOT IN USE.

EXCAVATION REQUIREMENTS

1. EXCAVATE SITE SOILS IN PHASES AS SHOWN ON THE EXCAVATION PLAN (DRAWING C-3). SOIL SAMPLING WAS PERFORMED ON A SAMPLING GRID SHOWN ON DRAWINGS C-2 AND C-3. THIS GRID SHALL BE USED AS THE "EXCAVATION GRID" DURING SOIL REMOVAL. SOILS WILL BE EXCAVATED IN 5-FOOT DEPTH INCREMENTS.

2. EXCAVATED SOILS SHALL BE TEMPORARILY STORED IN A STOCKPILE OR DIRECTLY LOADED INTO A HAUL TRUCK FOR DISPOSAL.

3. SOILS LEFT IN THE STOCKPILE AFTER WORK HOURS SHALL BE COVERED WITH 10-MIL PLASTIC SHEETING (OR SIMILAR).

4. CONTRACTOR SHALL SEGREGATE CLEAN OVERBURDEN FROM IMPACTED SOILS AND PLACE THE SOILS IN SEPARATE STOCKPILES. CLEAN OVERBURDEN SHALL BE REUSED AT THE SITE AS GENERAL FILL. IMPACTED SOILS AND WATER SHALL BE DISPOSED OF AT AN APPROVED DISPOSAL FACILITY.

5. CONTRACTOR SHALL BE RESPONSIBLE FOR PERFORMING THE WORK IN ACCORDANCE WITH OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) REGULATIONS, INCLUDING THOSE FOR SLOPING AND BENCHING.

6. TRENCH BOXES OR OTHER TYPES OF TEMPORARY SHORING SHALL BE USED WHERE SLOPING AND BENCHING IS NOT SAFE. TRENCH BOXES MUST BE USED FOR EXCAVATIONS AT THE SITE DEEPER THAN 10 FEET. CONTRACTOR SHALL BE RESPONSIBLE FOR ASSESSING THE NEED FOR TRENCH BOXES OR TEMPORARY SHORING FOR SHALLOWER EXCAVATIONS BASED ON THE SITE CONDITIONS, INCLUDING, BUT NOT LIMITED TO, THE SOIL AND GROUNDWATER CONDITIONS.

7. CONTRACTOR SHALL RETAIN A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF WASHINGTON TO DESIGN TEMPORARY SHORING (INCLUDING TRENCH BOXES).

8. CONTRACTOR SHALL REMOVE BELOW-GROUND DEBRIS, AS NEEDED, TO FACILITATE TRENCH BOX INSTALLATION AND ACHIEVE THE REMOVAL LIMITS SPECIFIED IN THE DRAWINGS OR AS DIRECTED BY THE ENGINEER.

9. OPERATORS AND FOREMAN SHALL HAVE A MINIMUM OF THREE YEARS EXPERIENCE INSTALLING EXCAVATION SUPPORT AND PROTECTION SYSTEMS.

10. TRENCH BOX MATERIALS SHALL BE UNDAMAGED AND SHALL CONFORM TO PERTINENT AISC, AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI), ASTM OR OTHER INDUSTRY STANDARDS.

11. CONTRACTOR SHALL NOTIFY THE ENGINEER AT LEAST FIVE DAYS PRIOR TO BEGINNING EXCAVATION SUPPORT AND PROTECTION INSTALLATION OPERATIONS AT ANY LOCATION.

12. TRENCH BOX SYSTEMS SHALL BE PROPERLY DECONTAMINATED.

BACKFILL REQUIREMENTS

1. WASHINGTON STATE DEPARTMENT OF TRANSPORT (WSDOT) STANDARD SPECIFICATIONS FOR ROAD, BRIDGE, AND MUNICIPAL CONSTRUCTION (M 41-10, 2016 VERSION) SHALL APPLY TO SELECTION AND APPROVAL OF VARIOUS MATERIALS WHERE INDICATED. THE STANDARD SPECIFICATIONS ARE AVAILABLE FOR DOWNLOAD ON WSDOT'S WEBSITE.

2. SATURATED ZONE BACKFILL SHALL CONSIST OF WSDOT CRUSHED SURFACING/BASE COURSE (PER WSDOT STANDARD SPECIFICATION SECTION 9-03.9(3) – BASE COURSE).

3. CRUSHED SURFACING SHALL CONSIST OF WSDOT CRUSHED SURFACING/TOP COURSE AND KEYSTONE (PER WSDOT STANDARD SPECIFICATION SECTION 9-03.9(3) – TOP COURSE AND KEYSTONE).

4. GENERAL FILL SHALL CONSIST OF CLEAN OVERBURDEN EXCAVATED AT THE SITE OR WSDOT COMMON BORROW (PER WSDOT STANDARD SPECIFICATION SECTION 9-03.14(3)).

5. SATURATED ZONE BACKFILL SHALL BE CAREFULLY PLACED ON THE BOTTOM OF THE EXCAVATION (UNDER WATER) USING AN EXCAVATOR BUCKET. THE MATERIAL SHALL NOT BE DUMPED INTO THE WATER FROM ELEVATIONS ABOVE THE WATER TABLE OR ANY ELEVATION ABOVE THE BOTTOM OF THE EXCAVATION. EACH 18-INCH LOOSE LIFT OF PLACED FILL SHALL BE TAMPED WITH THE EXCAVATOR BUCKET TO COMPACT THE FILL. FILL SATURATED ZONE BACKFILL TO 6 INCHES ABOVE THE WATER TABLE AND THEN COMPACT THE MATERIAL USING A VIBRATORY DRUM COMPACTOR WITH A MINIMUM OPERATING WEIGHT OF 4 TONS AND MINIMUM CENTRIFUGAL FORCE OF 50 KILO NEWTON (KN), OR EQUIVALENT COMPACTION EQUIPMENT APPROVED BY THE ENGINEER. THE MATERIAL SHALL BE ROLLED IN VIBRATORY MODE WITH A MINIMUM OF FOUR PASSES UNTIL A NON-YIELDING STATE IS ACHIEVED.

6. PLACE GENERAL FILL IN UNIFORM LAYERS NOT EXCEEDING A LOOSE LIFT THICKNESS OF 10 INCHES. CONTROL THE MOISTURE CONTENT OF THE FILL TO WITHIN 3% OF THE OPTIMUM MOISTURE. OPTIMUM MOISTURE IS THE MOISTURE CONTENT CORRESPONDING TO THE MAXIMUM DRY DENSITY OF THE MATERIAL. COMPACT EACH LAYER TO A MINUMUM DENSITY OF 90% OF THE MAXIMUM DRY DENSITY OF THE MATERIAL DETERMINED USING ASTM INTERNATIONAL STANDARD ASTM D698.

7. COMPACT CRUSHED SURFACING USING A VIBRATORY DRUM COMPACTOR WITH A MINIMUM OPERATING WEIGHT OF 4 TONS AND MINIMUM CENTRIFUGAL FORCE OF 50 KILO NEWTON (KN), OR EQUIVALENT COMPACTION EQUIPMENT APPROVED BY THE ENGINEER. THE MATERIAL SHALL BE ROLLED IN VIBRATORY MODE WITH A MINIMUM OF FOUR PASSES UNTIL A NON-YIELDING STATE IS ACHIEVED.

8. PRIOR TO IMPORT MATERIAL ARRIVING ON SITE, CONTRACTOR SHALL PROVIDE ANALYTICAL TESTING RESULTS FOR IMPORT MATERIAL TO THE ENGINEER.

CONTRACTOR SUBMITTALS

1. A SOURCE, NAME, AND POINT OF CONTACT TELEPHONE NUMBER SHALL BE PROVIDED FOR ALL IMPORT MATERIALS FURNISHED BY THE CONTRACTOR

2. THE ENGINEER MAY REQUEST ADDITIONAL SUBMITTALS BEYOND THOSE SPECIFIED HEREIN.

3. SUBMITTALS SHALL BE TRANSMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL PRIOR TO THE USE OF ASSOCIATED MATERIALS ON-SITE. UPON REVIEW, THE ENGINEER WILL INDICATE WHETHER THE SUBMITTAL IS APPROVED, APPROVED AS NOTED, REQUIRES RESUBMITTAL TO ADDRESS DEFICIENCIES OR REJECTED.

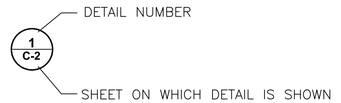
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING WITH THE ENGINEER THAT ALL REQUIRED SUBMITTALS FOR A GIVEN MATERIAL HAVE BEEN APPROVED BY THE ENGINEER PRIOR TO BRINGING THE MATERIAL ON-SITE. MATERIALS NOT IN CONFORMANCE WITH THE REQUIREMENTS CONTAINED HEREIN AS DETERMINED BY THE ENGINEER BASED ON REVIEW OF THE ASSOCIATED SUBMITTALS SHALL NOT BE PERMITTED ON-SITE.

5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR TRACKING TRUCKS TO BE LOADED WITH EXCAVATION MATERIAL.

6. THE FOLLOWING BACKFILL MATERIAL INFORMATION SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL PRIOR TO USE ONSITE;
   A. THE SOURCE FOR ALL IMPORT MATERIAL
   B. SPECIFICATIONS AND TESTING RESULTS FOR ALL IMPORTED MATERIAL.

7. THE FOLLOWING TRENCH BOX SYSTEM INFORMATION SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL PRIOR TO USE ONSITE;
   A. CERTIFICATION: PROVIDE DOCUMENTATION OF AGREEMENT WITH TRENCH BOX SYSTEM MANUFACTURER FOR PROVISIONS OF QUALITY CONTROL SERVICES DURING INSTALLATION. AGREEMENT SHALL DOCUMENT THAT MANUFACTURER WILL PROVIDE FIELD TECHNICIAN SERVICES DURING THE FIRST 3 DAYS OF OPERATION OF THE TRENCH BOX SYSTEM.
   B. INSTALLATION PLAN: SUBMIT AN EXCAVATION SUPPORT INSTALLATION PLAN
   C. SHOP DRAWINGS: SHOP DRAWINGS SHALL SHOW THE PROPOSED TRENCH BOX SYSTEM AND DETAILS FOR EACH REMOVAL AREa and DETAILS PERTAINING TO CONNECTIONS OF TRENCH BOX COMPONENTS (I.E., POSTS TO BRACING MEMBER.
   D. MANUFACTURER'S DATA: STRUCTURAL PROPERTIES OF THE TRENCH BOX COMPONENTS, INCLUDING MOMENT OF INERTIA, MOMENT CAPACITY, THICKNESS, AND WIDTH/DEPTH DIMENSIONS.

LEGEND:



THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name
CARSTEN BECKER
Professional Engineer's No.
39822

State	Date Signed	Project Mgr.
WA	09/21/16	B.MARCUM
Designed by	Drawn by	Checked by
R. KILKENNY	A.REYES	C. BECKER

ARCADIS Design & Consultancy for natural and built assets

ARCADIS U.S., INC.

FORMER INDUSTRIAL PETROLEUM DISTRIBUTORS • 1120 WEST BAY DRIVE NORTHWEST, OLYMPIA, WASHINGTON
CONTRACT DRAWINGS

GENERAL NOTES AND SPECIFICATIONS

ARCADIS Project No.
GP09BPNA.WA60.K0000

Date
SEPTEMBER 2016

ARCADIS
1100 OLIVE WAY, SUITE 800
SEATTLE, WA 98102
TEL.206.726.4739

G-1

ENVIRONMENTAL PROTECTION:

1. THE CONTRACTOR SHALL SUBMIT THEIR ENVIRONMENTAL PROTECTION PLAN, WHICH SHALL INCLUDE SPILL PREVENTION AND RESPONSE PROCEDURES.
2. THE CONTRACTOR SHALL USE BEST MANAGEMENT PRACTICES (BMPs) AND INSTALL AND MAINTAIN TEMPORARY POLLUTION CONTROL FEATURES AS PART OF THE WORK.
3. THE CONTRACTOR SHALL BE PREPARED AT ALL TIMES TO INTERCEPT, CLEAN UP, AND DISPOSE ANY SPILLS THAT MAY OCCUR.
4. THE CONTRACTOR SHALL KEEP ALL MATERIALS REQUIRED TO CLEAN UP SPILLS (SPILL KITS) READILY AVAILABLE ON SITE.
5. CONTRACTOR SHALL SUBMIT A DECONTAMINATION PLAN TO PROVIDE DETAILS ON DECONTAMINATION PROCEDURES, DECONTAMINATION AREAS, AND THE MANAGEMENT OF DECONTAMINATION WASTES.
6. DECONTAMINTE EQUIPMENT AND REUSABLE MATERIALS PRIOR TO DEPARTURE FROM THE SITE, PRIOR TO RELOCATION WITHIN THE SITE (IF RELOCATING TO A CLEAN AREA), AND PRIOR TO HANDLING CLEAN MATERIALS.
7. DECONTAMINTE EQUIPMENT AND REUSABLE MATERIALS BY REMOVING VISIBLE SOLIDS AND THEN HIGH-PRESSURE WASHING AND/OR STEAM CLEANING. SURFACTANTS AND DETERGENTS MAY BE USED AS APPROVED BY THE ENGINEER.
8. EACH PIECE OF EQUIPMENT OR MATERIAL MUST BE INSPECTED BY THE CONTRACTOR PRIOR TO DEPARTURE FROM THE SITE TO VERIFY THAT DECONTAMINATION HAS BEEN CONDUCTED. CONTRACTOR SHALL PROVIDE DOCUMENTATION OF DECONTAMINATION TO THE ENGINEER.
9. CONTAIN DECONTAMINATION WATER, SOLIDS, AND OTHER MATERIALS GENERATED DURING EQUIPMENT DECONTAMINATION AT THE SITE, AND DO NOT ALLOW THESE MATERIALS TO BE RELEASED TO PUGET SOUND OR TO CONTACT NATIVE MATERIALS.

STORM WATER POLLUTION CONTROL

1. THIS PROJECT SHALL BE IN COMPLIANCE WITH ALL APPLICABLE FEDERAL, STATE, AND LOCAL REQUIREMENTS FOR SOIL AND EROSION CONTROL AND STORM WATER MANAGEMENT. THESE REQUIREMENTS AS THEY PERTAIN TO THIS PROJECT ARE DETAILED IN THE STORMWATER POLLUTION PREVENTION PLAN (SWPPP) THAT HAS BEEN APPROVED BY THE WASHINGTON STATE DEPARTMENT OF ECOLOGY(CONSTRUCTION STORMWATER GENERAL PERMIT # WAR303363).
2. CONTRACTOR ACTIVITIES SHALL BE PERFORMED IN ACCORDANCE WITH THE STORM WATER POLLUTION PREVENTION PLAN (SWPPP).
3. A COPY OF THE SWPPP SHALL REMAIN ON SITE AT ALL TIMES.
4. RECORDS OF ALL INSPECTIONS, COMPLIANCE CERTIFICATION AND NON-COMPLIANCE REPORTING SHALL BE RETAINED FOR A PERIOD OF AT LEAST (3) YEARS.
5. GENERAL MANAGEMENT PRACTICES, HEREIN, SHALL BE FOLLOWED TO MINIMIZE THE STORM WATER POLLUTION EMANATING FROM THIS WORK SITE AND ACHIEVE THE FOLLOWING (DETAILED IN THE SWPPP):
   - A. KEEP MATERIALS OUT OF DRAINAGEWAYS
   - B. REDUCE OFF-SITE TRACKING OF SEDIMENT
   - C. KEEP POLLUTANTS OFF EXPOSED SURFACES
   - D. PREVENT POLLUTANT CONTACT WITH RAINFALL OR RUNOFF
   - E. PROTECT EXISTING VEGETATION TO BE RETAINED
   - F. MINIMIZE WASTE AND DISPOSE OF WASTE PROPERLY
   - G. PREVENT SPILLS AND LEAKS; CLEAN SPILLS AND LEAKS IMMEDIATELY
   - H. COVER AND SECURELY STORE ALL MATERIALS
   - I. KEEP CONCRETE AND CEMENT MORTAR OUT OF DRAINAGE WAYS AND STREAMS
   - J. AVOID OVER-APPLYING FERTILIZERS, PESTICIDES OR HERBICIDES
   - K. CONTROL EROSION AND RUN-OFF OF SEDIMENT
   - L. BEST MANAGEMENT PRACTICE (BMP) C-105 STABILIZED CONSTRUCTION ENTRANCE SHALL BE FOLLOWED. THE EXISTING ENTRANCE IS IMPROVED WITH ASPHALT PAVING PRIOR TO ENTERING THE PUBLIC RIGHT OF WAY FOR A DISTANCE OF OVER 100 FEET. VEHICLES LEAVING THE SITE SHALL BE INSPECTED AND DRY DECONTAMINATION SHALL BE CONDUCTED BY SCRUB/BRUSH AND/OR THE USE OF RUMBLE STRIPS PRIOR TO THE STABILIZED CONSTRUCTION ENTRANCE.
6. NO DISCHARGE FROM WASHING CONCRETE, CEMENT, STUCCO, OR OTHER SUCH MATERIAL SHALL BE ALLOWED TO ENTER ANY DRAINAGEWAY, PAVED AREA, OR ADJACENT PROPERTY. ALL RESIDUE SHALL BE DISPOSED OF PER STATE/FEDERAL STANDARDS AND REGULATIONS.
7. THE SEQUENCE OF CONSTRUCTION ACTIVITIES AND THE PROPOSED MITIGATION ELEMENTS SHALL BE AS FOLLOWS:
   - A. COMPLETE NOTICE OF INTENT (NOI) 60 DAYS PRIOR TO START OF FIELD ACTIVITIES.
   - B. INSPECT CONSTRUCTION ENTRANCE AT ALL ACCESS POINTS.
   - C. INSTALL SILT FENCE AT GRADING LIMITS AND OTHER AREAS AS INDICATED.
   - D. GRUB, CLEAR AND/OR ROUGH GRADE THE SITE AS NEEDED.
   - E. CREATE TEMPORARY CONSTRUCTION AND WASTE MATERIALS STORAGE AND CONTAINMENT AREA.
   - F. PROTECT EXISTING DRAINAGE INLETS WITH WATTLES AS INDICATED.
   - G. REMOVE SILT FENCE AND ALL SWPPP EROSION AND SEDIMENT CONTROL MEASURES.
   - H. REMOVE TEMPORARY CONSTRUCTION AND WASTE MATERIAL CONTAINMENT AREA.
   - I. COMPLETE NOTICE OF TERMINATION (NOT) PROCESS FOR PROJECT.
8. ALL DUST CONTROL SHALL BE MANAGED BY THE APPLICATION OF WATER.
9. THE SWPPP SHALL INCLUDE MAINTENANCE, REPAIR, AND TRACKING PROCEDURES TO ENSURE THAT ALL GRADED SURFACES, MITIGATION MEASURES, AND OTHER PROTECTIVE MEASURES ARE IMPLEMENTED AND MAINTAINED IN A GOOD AND EFFECTIVE CONDITION AND ARE REPAIRED OR RESTORED IF DAMAGED. THE REQUIRED INSPECTION REPORTS SHALL CONTAIN THE FOLLOWING INFORMATION:
   - A. NAME OF INSPECTOR
   - B. DATE
   - C. MAJOR OBSERVATIONS, AND DIGITAL PHOTOGRAPHS
   - D. SEDIMENT REMOVAL IF SEDIMENT TRAP CAPACITY IS REDUCED BY 50% OR SEDIMENT DEPTH EXCEEDS 6", WHICHEVER COMES FIRST
   - E. IF ALL CONDITIONS ARE DEEMED ACCEPTABLE AT TIME OF INSPECTION, THE REPORT SHALL BE CERTIFIED TO BE IN COMPLIANCE WITH THE SWPPP
   - F. QUALIFICATIONS OF THE INSPECTOR

EROSION AND SEDIMENT CONTROL

1. EROSION AND SEDIMENT CONTROL SHALL BE ACHIEVED USING THE FOLLOWING TECHNIQUES:
   - A. CLEARLY IDENTIFY THE LIMITS OF GRADING AND DISTURBANCE IN THE FIELD.
   - B. CONSTRUCTION FENCING OR OTHER EQUALLY ACCEPTABLE METHODS SHALL BE EMPLOYED TO LIMIT THE EXTENT OF DISTURBANCE TO APPROVED AREAS ONLY.
2. THE FOLLOWING CONTROL MEASURES SHALL BE USED AS SHOWN ON PLAN AND WHERE APPROPRIATE TO CONTROL OFFSITE DISCHARGE OF SEDIMENT.
   - A. TEMPORARY ROCK RIP-RAP
   - B. GEOTEXTILES
   - C. SILTATION FENCES
   - D. TEMPORARY SEDIMENT TRAPS
   - E. SANDBAG BARRIERS.
   - F. WATTLES
   - G. ROCK BERMS
3. BEST MANAGEMENT PRACTICES SHALL BE UTILIZED TO KEEP THE SITE FREE OF LOOSE DEBRIS. SOLID WASTE AND DEBRIS SHALL BE CONTAINED WITH SILT FENCING. SILT FENCING SHALL BE SUPPLEMENTED BY OTHER CONTROL MEANS INCLUDING, BUT NOT LIMITED TO:
   - A. ALL LOOSE DEBRIS SHALL BE PLACED INTO PROPER DEBRIS RECEPTACLE FACILITY
   - B. THE SITE SHALL BE POLICED AND DEBRIS CONTAINED PROPERLY ON A DAILY BASIS
   - C. OFFSITE ACCUMULATION OF SEDIMENT SHALL BE REMOVED EVERY SEVEN DAYS, AFTER A RAINFALL, IF SEDIMENT TRAP CAPACITY IS REDUCED BY 50%, OR SEDIMENT DEPTH EXCEEDS 6", WHICHEVER COMES FIRST. REMOVE AND DISPOSE OF SEDIMENT BY PROPER AND APPROVED METHODS ACCORDING TO ALL LOCAL, STATE AND FEDERAL REGULATIONS.

WASTE MANAGEMENT AND DISPOSAL

1. THE CONTRACTOR SHALL COMPLY WITH APPLICABLE STATE AND FEDERAL REGULATIONS, STANDARDS, AND GUIDELINES FOR HANDLING AND DISPOSAL OF SOLID AND HAZARDOUS WASTE.
2. EXCAVATED SOIL AND WASTE WATER SHALL BE DISPOSED OF AT AN APPROPRIATE DISPOSAL FACILIITY APPROVED BY THE ENGINEER.
3. CONTRACTOR SHALL HANDLE, LOAD/UNLOAD, TRANSPORT, TREAT, AND DISPOSE WASTE IN A MANNER THAT IS PROTECTIVE OF THE ENVIRONMENT.
4. THE CONTRACTOR WILL BE RESPONSIBLE FOR COMPLETION, MANAGEMENT, AND TRACKING OF ALL TRANSPORTATION AND DISPOSAL DOCUMENTATION, INCLUDING BILLS OF LADING, WASTE MANIFESTS, AND CERTIFICATES OF DISPOSAL.
5. THE CONTRACTOR WILL BE RESPONSIBLE FOR PROCESSING THE EXCAVATED SOIL SUCH THAT THE MATERIAL MEETS THE REQUIREMENTS OF THE DISPOSAL FACILITIES IN TERMS OF MAXIMUM PARTICLE SIZE/DEBRIS SIZE, MOISTURE CONTENT, AND PRESENCE OF FREE LIQUIDS. PROCESSING INCLUDES SCREENING OUT DEBRIS AND MOISTURE CONDITIONING. ADDITION OF STABILIZING AGENT FOR MOISTURE CONDITIONING OF WET SOIL SHALL BE MINIMIZED TO THE EXTENT POSSIBLE.
6. DEWATERING OF EXCAVATED SOIL SHALL BE ACCOMPLISHED BY GRAVITY DEWATERING USING A DEWATERING PAD AS SHOWN ON THE CONTRACT DRAWINGS. THE CONTRACTOR MAY SUBMIT AN ALTERNATE METHOD OF DEWATERING FOR APPROVAL BY THE ENGINEER. DEWATERING SHALL BE PERFORMED IN A FASHION THAT IS PROTECTIVE OF THE ENVIRONMENT AND PROTECTIVE OF SURFACES THAT ARE CLEAN OR HAVE BEEN REMEDIATED.
7. LOAD WASTE FOR TRANSPORT IN A MANNER THAT PREVENTS SPILLAGE OR SPREADING OF WASTE. PROVIDE PROTECTIVE TEMPORARY COVERING, SUCH AS POLYETHYLENE SHEETING (6-MIL VISQUEEN OR EQUIVALENT), TO PROTECT CLEAN AREAS SITUATED BETWEEN TRANSPORT AND THE EXCAVATION FROM CROSS-CONTAMINATION DUE TO SPILLAGE OR DRIPPING OF WASTE MATERIAL.
8. IMMEDIATELY CLEAN UP ANY WASTE MATERIAL SPILLED OR SPREAD INTO NON-CONTAMINATED AREAS. DISPOSE ANY SPREAD OR SPILLED CONTAMINATED MATERIAL.
9. ALL TRANSPORTS LEAVING THE WORK AREA SHALL HAVE ALL VISIBLE MUD AND WASTE REMOVED AT AN APPROPRIATE LOCATION PRIOR TO LEAVING THE WORK AREA.
10. FOR EACH WASTE DISPOSED AT FACILITIES, WEIGH EACH TRANSPORT AT THE DISPOSAL FACILITY TO DOCUMENT THE WEIGHT OF WASTE DISPOSED. PROVIDE A TARE WEIGHT FOR EACH TRANSPORT SO THAT THE NET WASTE WEIGHT CAN BE CALCULATED FROM THE GROSS TOTAL VEHIBLE WEIGHT.

CONSTRUCTION ENTRANCE

1. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT PREVENTS TRACKING OR FLOW OF MUD OFF OF THE SITE.
2. ALL MATERIALS SPILLED, DROPPED, WASHED, OR TRACKED FROM VEHICLES ONTO ROADWAYS OR INTO STORM DRAINS SHALL BE REMOVED IMMEDIATELY. WHEN NECESSARY, VEHICLE WHEELS SHOULD BE CLEANED TO REMOVE SEDIMENT PRIOR TO LEAVING THE SITE. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH AGGREGATE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP.
3. TRAPPED SEDIMENT SHALL BE REMOVED FROM THE SITE OR STABILIZED ON SITE AND PREVENTED FROM ENTERING STORM DRAINS, DITCHES, OR WATERWAYS. DISTURBED AREAS RESULTING FROM REMOVAL SHALL BE PERMANENTLY STABILIZED.
4. INSPECT STABILIZED ACCESS ACCORDING TO INSPECTION SCHEDULES.

SILT FENCE

1. SILT FENCE SHALL BE 10 FEET (MIN) FROM STEEP SLOPES. THE FENCE SHALL BE LEVEL.
2. ATTACH CONTINUOUS LENGTH OF FABRIC TO UP SLOPE SIDE OF FENCE POSTS. AVOID JOINTS, PARTICULARLY AT LOW POINTS IN THE FENCE LINE. WHERE JOINTS ARE NECESSARY, FASTEN FABRIC SECURELY TO SUPPORT POSTS WITH A MINIMUM 6 INCH OVERLAP TO THE NEXT POST.
3. SILT FENCE FABRIC SHALL NOT BE ATTACHED TO TREES OR ANY OTHER VEGETATION.
4. PLACE THE FABRIC IN THE TRENCH SO THE BOTTOM FOLDS ACROSS THE BOTTOM OF THE TRENCH. PLACE BACKFILL IN THE TRENCH OVER THE FABRIC TO THE GROUND LINE AND COMPACT WITH A POWER TAMPER.
5. THE GEOTEXTILE FABRIC SHALL BE PLACED IN THE EXCAVATED TRENCH, BACKFILLED, AND COMPACTED TO THE EXISTING GROUND SURFACE.
6. WOODEN SUPPORT POSTS SHALL BE A MINIMUM CROSS SECTIONAL AREA OF 3 SQUARE INCHES, AIR OR KILN DRIED OF HICKORY OR OAK AND 4 FEET LONG. STEEL POSTS SHALL BE STUDDED "TEE" OR "U" TYPE WITH A MINIMUM WEIGHT OF 1.3 POUNDS PER LINEAL FOOT AND 5 FEET LONG. POST SPACING SHALL BE A MAXIMUM OF 6.25 FEET ON CENTER
7. THE GEOTEXTILE FABRIC SHALL CONSIST OF EITHER WOVEN OR NON-WOVEN POLYESTER, POLYPROPYLENE, STABILIZED NYLON, POLYETHYLENE, OR POLYVINYLIDENE CHLORIDE. NON-WOVEN FABRIC MAY BE NEEDLE PUNCHED, HEAT BONDED, RESIN BONDED, OR COMBINATIONS THEREOF. ALL FABRIC SHALL MEET THE FOLLOWING REQUIREMENTS:

GEOTEXTILE FOR TEMPORARY SILT FENCE		
GEOTEXTILE PROPERTY	ASTM TEST METHOD	GEOTEXTILE PROPERTY REQURIEMENTS
AOS	D4751	NO. 30 MAX. FOR SILT WOVENS, NO. 50 FOR ALL OTHER GEOTEXTILE TYPES, NO. 100 MIN.
WATER PERMITTIVITY	D4491	0.02 SEC^{-1} MIN.
GRAB TENSILE STRENGTH, IN MACHINE AND X-MACHINE DIRECTION	D4632	180 LB. MIN. IN MACHINE DIRECTION, 100 LB MIN. IN X-MACHINE DIRECTION
GRAB TENSILE STRENGTH, IN MACHINE AND X-MACHINE DIRECTION	D4632	30% MAX. AT 180 LB OR MORE
ULTRAVIOLET (UV) RADIATION STABILITY	D4355	70% STRENGTH RETAINED MIN., AFTER 500 HOURS IN XENON ARC DEVICE

* ALL NUMERICAL VALUES REPRESENT MINIMUM/MAXIMUM AVERAGE ROLL VALUES. FOR EXAMPLE, THE AVERAGE OF MINIMUM TEST RESULTS ON ANY ROLL IN A LOT SHOULD MEET OR EXCEED THE MINIMUM SPECIFIED VALUES.

8. THE GEOTEXTILE FABRIC SHALL BE ATTACHED DIRECTLY TO THE UP SLOPE SIDE OF WOODEN POSTS WITH 0.5 INCH STAPLES IN AT LEAST 3 PLACES, OR WITH WOODEN LATH AND NAILS. ATTACHMENT TO STEEL POSTS WILL BE BY WIRE FASTENERS OR 50 POUND PLASTIC TIE STRAPS ON THE UP SLOPE SIDE.
9. INSPECT SEDIMENT FENCES ACCORDING TO REPORT INSPECTION SCHEDULES AND FOLLOWING ALL HEAVY RAIN OR HIGH WATER EVENTS.
10. SHOULD GEOTEXTILE FABRIC TEAR, DECOMPOSE, OR IN ANY WAY BECOME INEFFECTIVE, REPLACE IMMEDIATELY.
11. REMOVE SEDIMENT DEPOSITS PROMPTLY TO PROVIDE ADEQUATE STORAGE VOLUME FOR THE NEXT RAINFALL AND REDUCE PRESSURE ON FENCE. TAKE CARE TO AVOID UNDERMINING FENCE DURING CLEAN OUT.
12. ALL FENCING MATERIALS AND UNSTABLE SEDIMENT DEPOSITS SHALL BE REMOVED UPON COMPLETION OF THE WORK. DISTURBED AREAS SHALL BE GRADED, STABILIZE, SEEDED AND/OR MULCHED TO FOSTER VEGETATIVE GROWTH.

SEDIMENT TRAPS

1. LOCATE THE STORM DRAIN INLETS NORTH AND SOUTH OF THE SITE ALONG WEST BAY DRIVE. WATTLES SHALL BE PLACED CONTINUOUSLY AND ON ALL SIDES OF STORM DRAINS.
2. INTENDED FOR TEMPORARY USE.
3. WATTLES SHALL BE REMOVED AFTER SITE CLEAN UP IS COMPLETE.

POST EXCAVATION STORM WATER MANAGEMENT

1. THE FOLLOWING CONTROL MEASURES SHALL BE IMPLEMENTED BY ARCADIS TO REDUCE POLLUTANTS IN STORM WATER DISCHARGE AFTER THE HEAVY SITE CIVIL EXCAVATION PHASES HAVE BEEN COMPLETED AT THE PROJECT SITE.
   - A. ROUTINE INSPECTION OF DRAINAGE WAYS BEFORE AND AFTER STORM EVENTS, INCLUDING CLEANING AND REMOVAL OF SEDIMENT AND DEBRIS
   - B. IMPLEMENTATION OF EROSION CONTROL MEASURES AS NEEDED IN THE LONG-TERM TO MITIGATE THE EFFECTS OF EROSION ON OPEN SLOPES ADJACENT TO AND WITHIN THE EXCAVATION SITE.

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Cko

Professional Engineer's Name: CARSTEN BECKER		
Professional Engineer's No.: 39822		
State: WA	Date Signed: 09/21/16	Project Mgr.: B.MARCUM
Designed by: R. KILKENNY	Drawn by: A.REYES	Checked by: C. BECKER

ARCADIS Design & Consultancy for natural and built assets

ARCADIS U.S., INC.

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CONTRACT DRAWINGS

EROSION AND SEDIMENT CONTROL NOTES

ARCADIS Project No. GP09BPNA.WA60.K0000

Date SEPTEMBER 2016

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1100 OLIVE WAY, SUITE 800
SEATTLE, WA 98102
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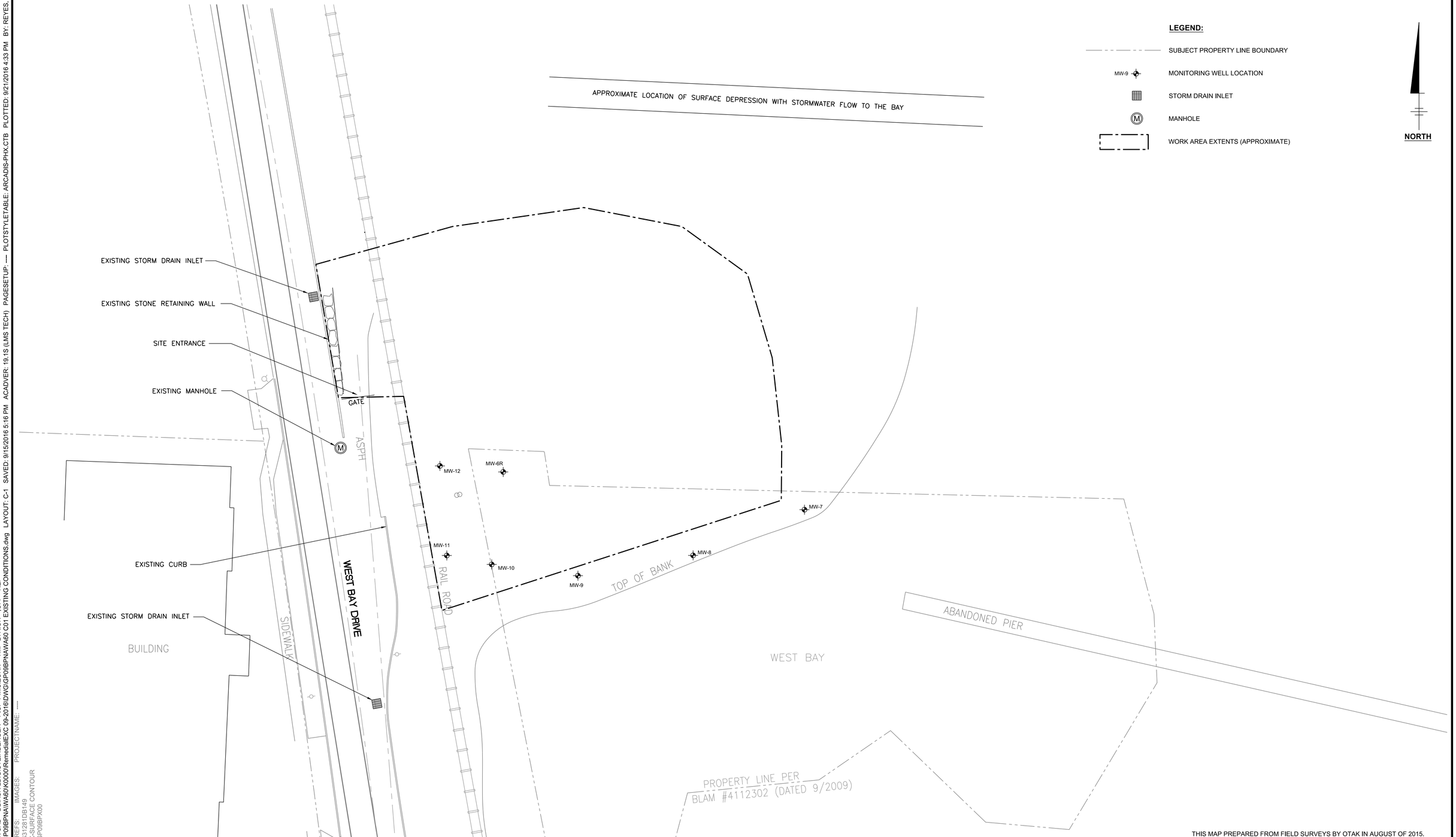
G-2



THIS MAP PREPARED FROM FIELD SURVEYS BY OTAK IN AUGUST OF 2015.

0 20' 40'
GRAPHIC SCALE: 1 in. = 20 ft.

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING:

USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: CARSTEN BECKER		
Professional Engineer's No.: 39822		
State: WA	Date Signed: 09/21/16	Project Mgr.: B.MARCUM
Designed by: R. KILKENNY	Drawn by: A.REYES	Checked by: C. BECKER

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ARCADIS U.S., INC.

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CONTRACT DRAWINGS

EXISTING CONDITIONS

ARCADIS Project No.
GP09BPNA.WA60.K0000

Date
SEPTEMBER 2016

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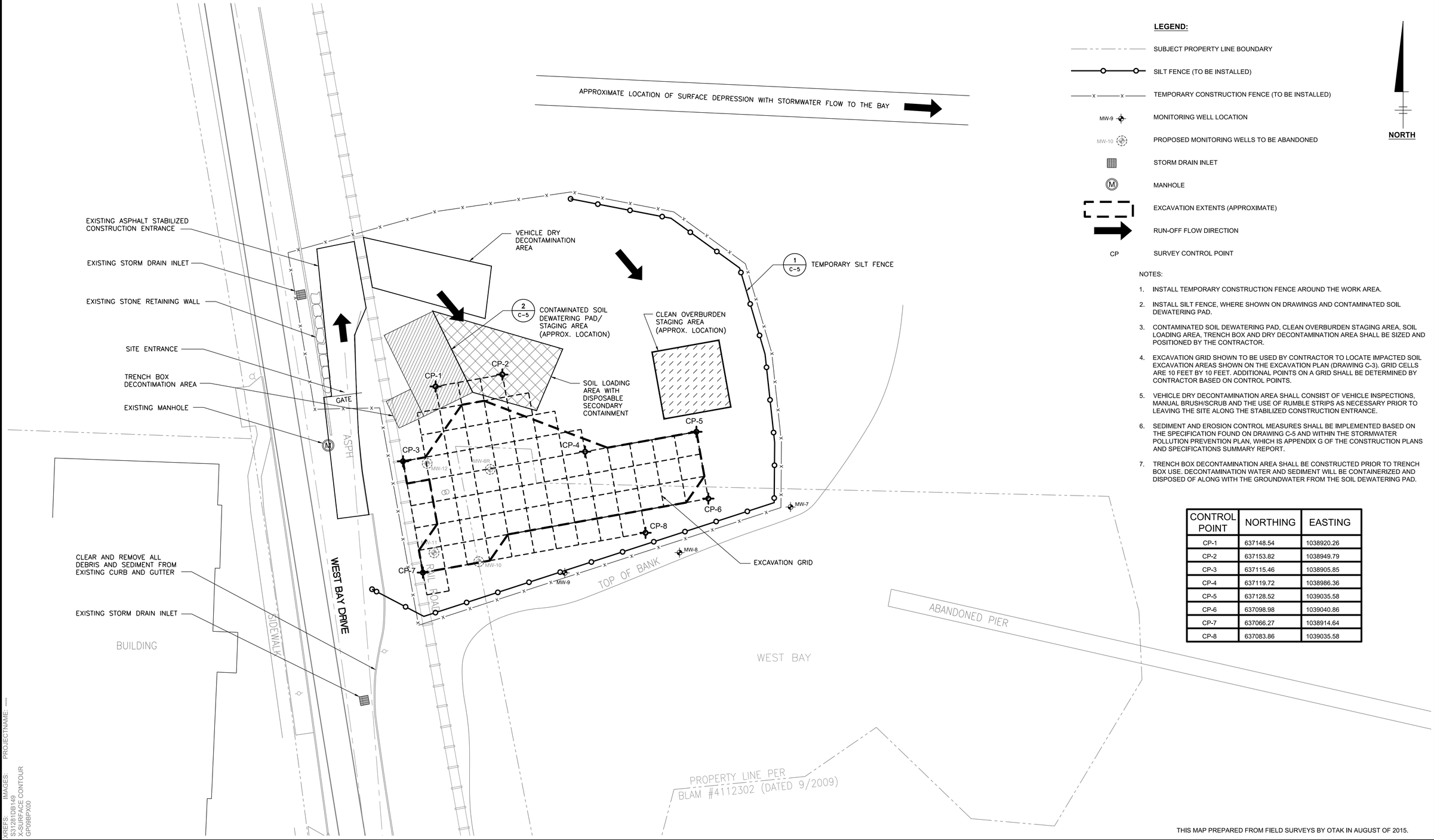
C-1



LEGEND:

- SUBJECT PROPERTY LINE BOUNDARY
- SILT FENCE (TO BE INSTALLED)
- TEMPORARY CONSTRUCTION FENCE (TO BE INSTALLED)
- MW-9 MONITORING WELL LOCATION
- MW-10 PROPOSED MONITORING WELLS TO BE ABANDONED
- STORM DRAIN INLET
- MANHOLE
- EXCAVATION EXTENTS (APPROXIMATE)
- RUN-OFF FLOW DIRECTION
- CP SURVEY CONTROL POINT

NORTH

NOTES:

1. INSTALL TEMPORARY CONSTRUCTION FENCE AROUND THE WORK AREA.
2. INSTALL SILT FENCE, WHERE SHOWN ON DRAWINGS AND CONTAMINATED SOIL DEWATERING PAD.
3. CONTAMINATED SOIL DEWATERING PAD, CLEAN OVERBURDEN STAGING AREA, SOIL LOADING AREA, TRENCH BOX AND DRY DECONTAMINATION AREA SHALL BE SIZED AND POSITIONED BY THE CONTRACTOR.
4. EXCAVATION GRID SHOWN TO BE USED BY CONTRACTOR TO LOCATE IMPACTED SOIL EXCAVATION AREAS SHOWN ON THE EXCAVATION PLAN (DRAWING C-3). GRID CELLS ARE 10 FEET BY 10 FEET. ADDITIONAL POINTS ON A GRID SHALL BE DETERMINED BY CONTRACTOR BASED ON CONTROL POINTS.
5. VEHICLE DRY DECONTAMINATION AREA SHALL CONSIST OF VEHICLE INSPECTIONS, MANUAL BRUSH/SCRUB AND THE USE OF RUMBLE STRIPS AS NECESSARY PRIOR TO LEAVING THE SITE ALONG THE STABILIZED CONSTRUCTION ENTRANCE.
6. SEDIMENT AND EROSION CONTROL MEASURES SHALL BE IMPLEMENTED BASED ON THE SPECIFICATION FOUND ON DRAWING C-5 AND WITHIN THE STORMWATER POLLUTION PREVENTION PLAN, WHICH IS APPENDIX G OF THE CONSTRUCTION PLANS AND SPECIFICATIONS SUMMARY REPORT.
7. TRENCH BOX DECONTAMINATION AREA SHALL BE CONSTRUCTED PRIOR TO TRENCH BOX USE. DECONTAMINATION WATER AND SEDIMENT WILL BE CONTAINERIZED AND DISPOSED OF ALONG WITH THE GROUNDWATER FROM THE SOIL DEWATERING PAD.

CONTROL POINT	NORTHING	EASTING
CP-1	637148.54	1038920.26
CP-2	637153.82	1038949.79
CP-3	637115.46	1038905.85
CP-4	637119.72	1038986.36
CP-5	637128.52	1039035.58
CP-6	637098.98	1039040.86
CP-7	637066.27	1038914.64
CP-8	637083.86	1039035.58

THIS MAP PREPARED FROM FIELD SURVEYS BY OTAK IN AUGUST OF 2015.

0 20' 40'
GRAPHIC SCALE: 1 INCH = 40 FT.
NOT TO SCALE

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: **CARSTEN BECKER**
Professional Engineer's No.: 39822

State	Date Signed	Project Mgr.
WA	09/21/16	B.MARCUM
Designed by	Drawn by	Checked by
R. KILKENNY	A.REYES	C. BECKER

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CONTRACT DRAWINGS

SITE PREPARATION PLAN

ARCADIS Project No. GP09BPNA.WA60.K0000
Date SEPTEMBER 2016

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C-2

CITY:EVMV DIV/GROUP:ENVCAD DB:ASR LD:G.STEINBERGER PIC: PM:S.ZORN TM: LYR:ON=*;OFF=*REF*
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XREFS: IMAGES: PROJECTNAME: ----
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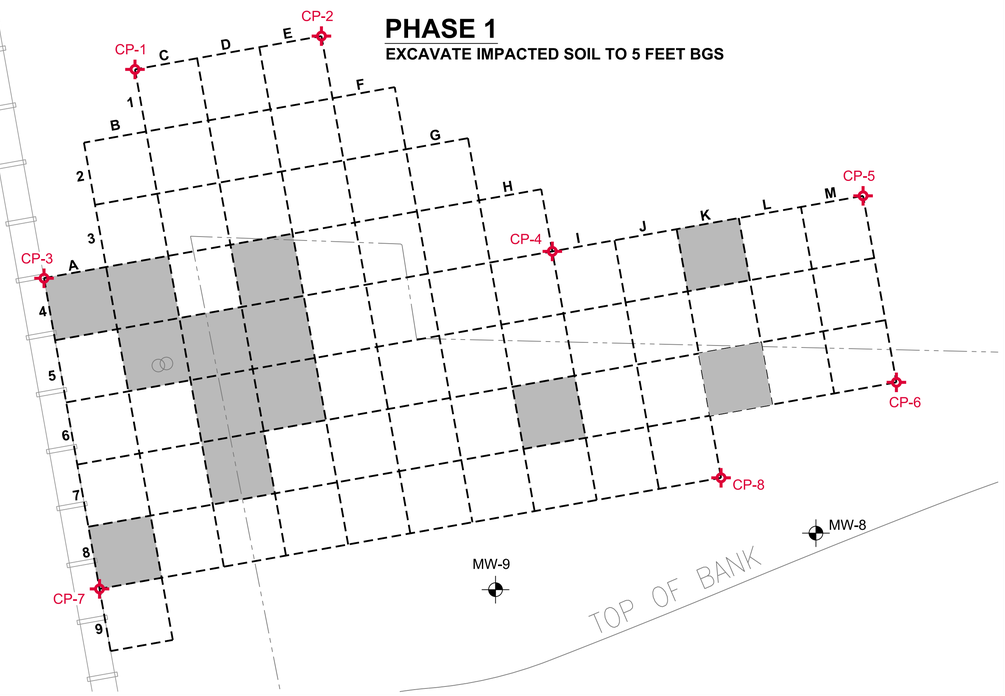
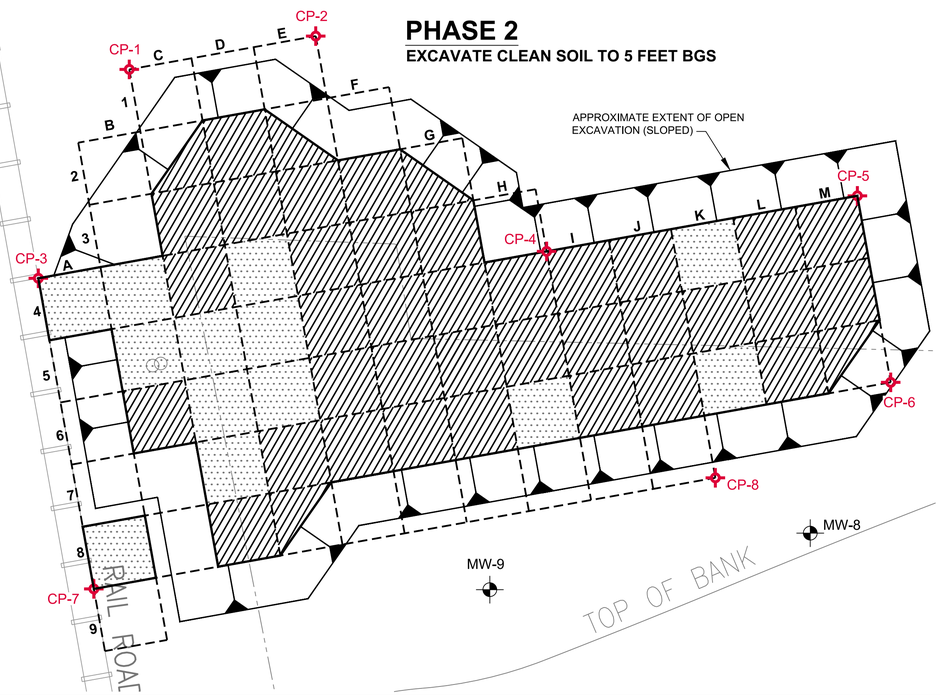
X-SURFACE CONTOUR
GP09BPX00

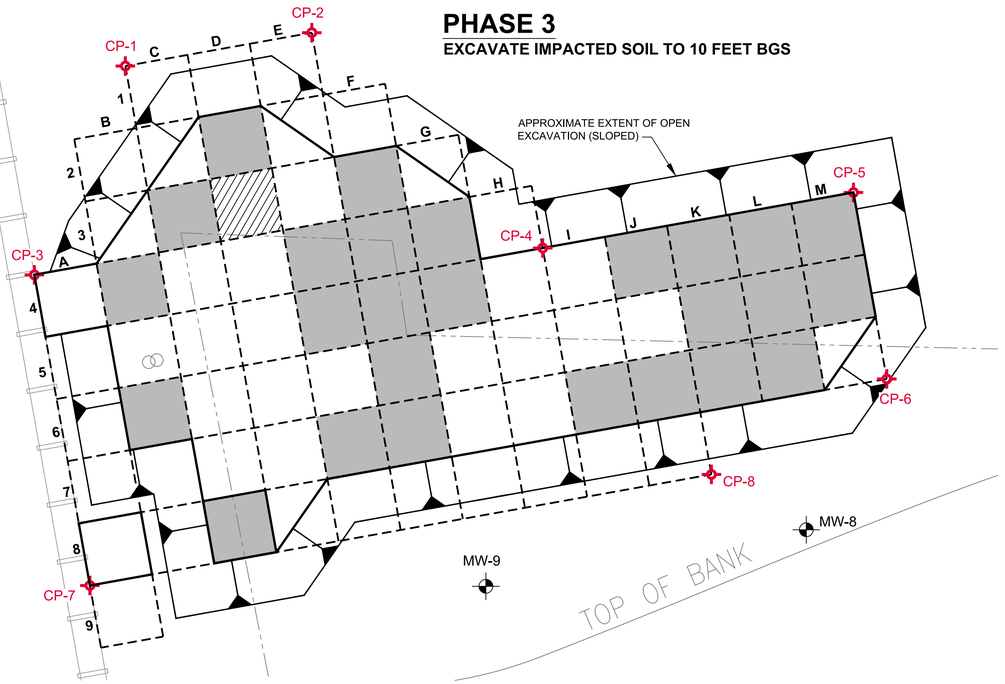
PHASE 1
EXCAVATE IMPACTED SOIL TO 5 FEET BGS



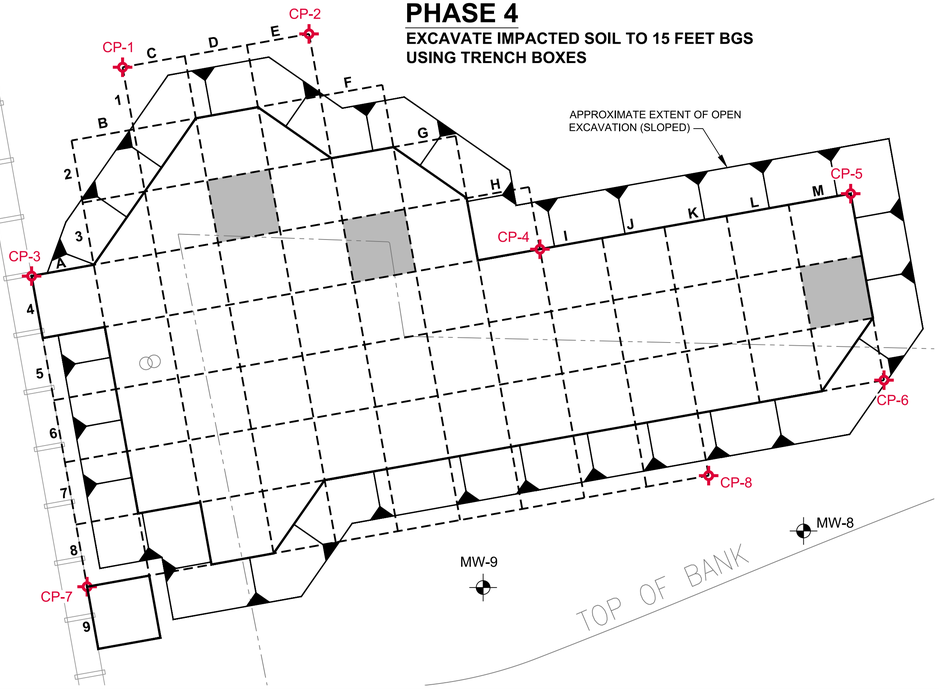
PHASE 2
EXCAVATE CLEAN SOIL TO 5 FEET BGS



PHASE 3
EXCAVATE IMPACTED SOIL TO 10 FEET BGS



PHASE 4
EXCAVATE IMPACTED SOIL TO 15 FEET BGS USING TRENCH BOXES



NORTH

LEGEND:

- SUBJECT PROPERTY LINE BOUNDARY
- SLOPED AREAS (APPROXIMATE)
- A / 4 — IMPACTED SOIL EXCAVATION EXTENTS
- A / 4 — CLEAN OVERBURDEN EXCAVATION EXTENTS
- A / 4 — PREVIOUSLY EXCAVATED AREA
- A / 4 — NO EXCAVATION IN RESPECTIVE PHASE
- CP — SURVEY CONTROL POINT

0 12' 24'
GRAPHIC SCALE: 1 in. = 12 ft.

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No.	Date	Revisions	By	Ckd

Professional Engineer's Name: **CARSTEN BECKER**
Professional Engineer's No.: 39822

State	Date Signed	Project Mgr.
WA	09/21/16	B.MARCUM
Designed by	Drawn by	Checked by
R. KILKENNY	A.REYES	C. BECKER

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CONTRACT DRAWINGS

EXCAVATION PLAN

ARCADIS Project No.
GP09BPNA.WA60.K0000

Date
SEPTEMBER 2016

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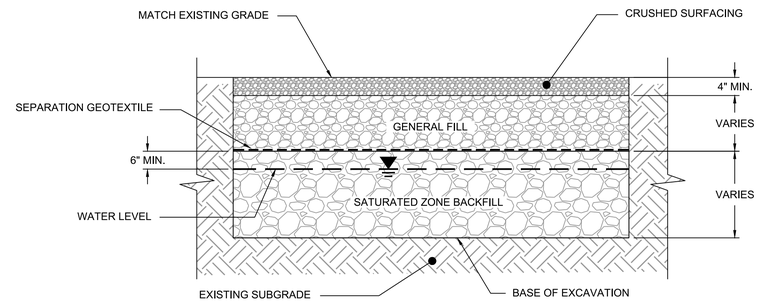
C-3

LEGEND:

- SUBJECT PROPERTY LINE BOUNDARY
- MW-9 — MONITORING WELL LOCATION
- STORM DRAIN INLET
- MW-13 — PROPOSED MONITORING WELL LOCATION
- EXCAVATION EXTENTS (APPROXIMATE) TO BE BACKFILLED AND RESTORED
- WORK AREA EXTENTS (APPROXIMATE)
- RUN-OFF FLOW DIRECTION

NORTH



1 C-3 RESTORATION DETAIL
NOT TO SCALE

SEPARATION GEOTEXTILE REQUIREMENTS				
TEST	TEST METHOD	UNITS	ELONGATION	
			<50%	≥50%
GRAB STRENGTH (MIN)	D4632	N	800	500
SEWN SEAM STRENGTH (MIN)	D4632	N	720	450
TEAR STRENGTH (MIN)	D4533	N	300	180
PUNCTURE STRENGTH (MIN)	D6241	N	1650	990
PERMITIVITY (MIN)	D4491	SEC^{-1}	0.02	
APPARENT OPENING SIZE (MIN)	D4751	mm	0.6	
ULTRAVIOLET STABILITY (MIN RETAINED STRENGTH)	D4355	%	50% RET @ 500 HRS	

NOTES:

1. BACKFILL AND RESTORE EXCAVATION AREA AS SHOWN ON RESTORATION DETAIL.
2. POST-CONSTRUCTION GRADES SHALL MATCH PRE-CONSTRUCTION GRADES.
3. AREAS OUTSIDE THE EXCAVATION AREA DISTURBED DUE TO CONSTRUCTION ACTIVITIES SHALL BE RESTORED BY THE CONTRACTOR TO PRE-CONSTRUCTION CONDITIONS. THIS MAY INCLUDE, BUT NOT BE LIMITED TO FILLING AND GRADING OF RUTS.

THIS MAP PREPARED FROM FIELD SURVEYS BY OTAK IN AUGUST OF 2015.

CITY:\EV\MV DIV/GROUP:ENVCAD DB:ASR LD:G.STEINBERGER PIC: PM:S.ZORN TM: LYR:ON=*;OFF=*REF*
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S3128108149
X-SURFACE CONTOUR
GP09BPX00

0 20' 40'
GRAPHIC SCALE: 1 in. = 20 ft.

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No.	Date	Revisions	By	Ckd

Professional Engineer's Name: **CARSTEN BECKER**
Professional Engineer's No.: 39822

State	Date Signed	Project Mgr.
WA	09/21/16	B.MARCUM
Designed by: R. KILKENNY	Drawn by: A.REYES	Checked by: C. BECKER

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CONTRACT DRAWINGS

RESTORATION PLAN AND DETAIL

ARCADIS Project No. GP09BPNA.WA60.K0000
Date: SEPTEMBER 2016

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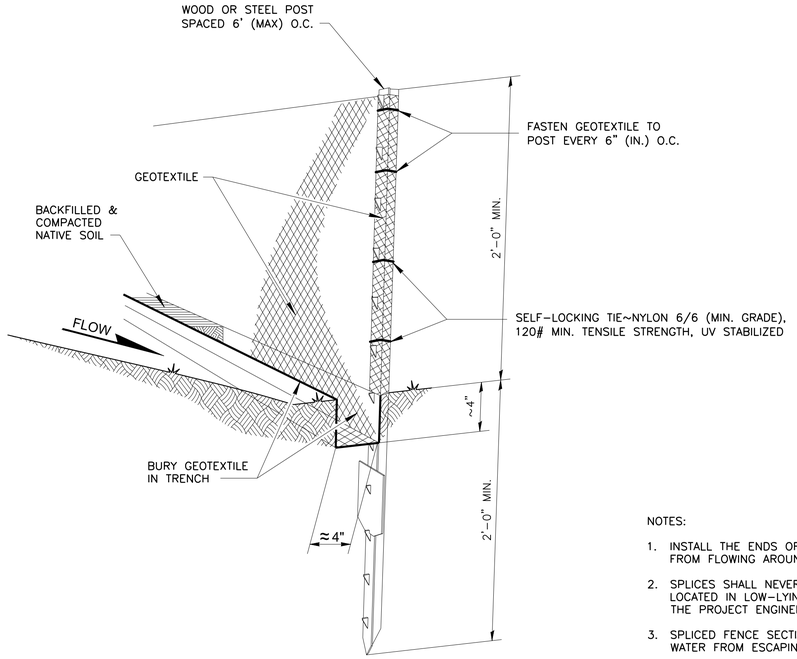
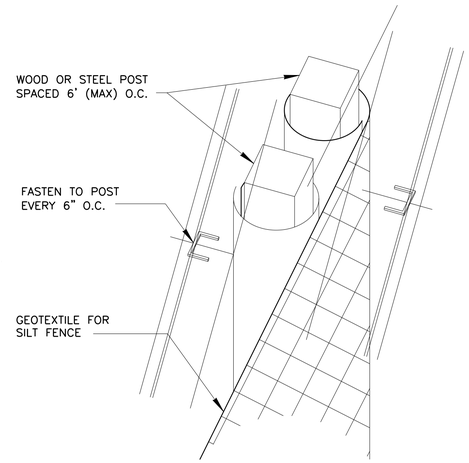
C-4

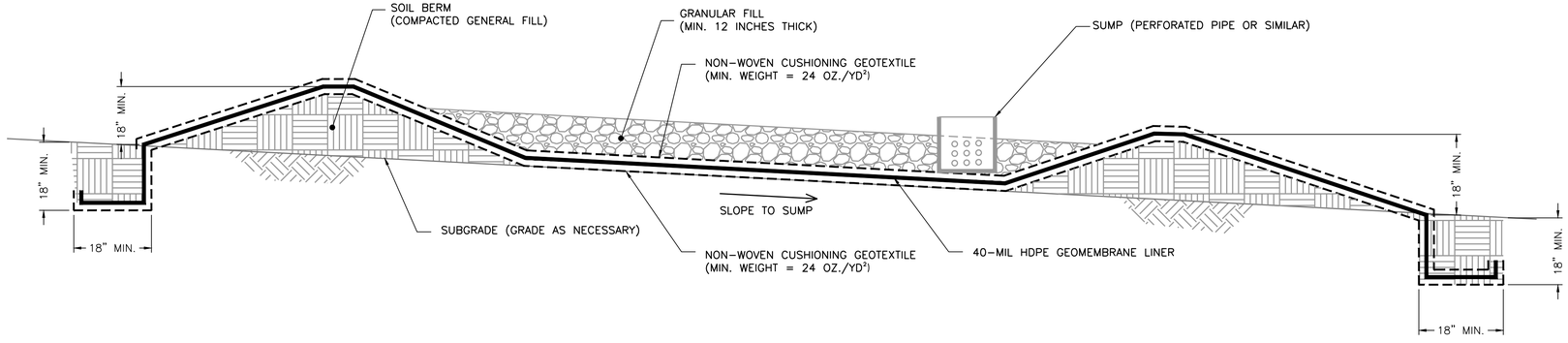




NOTES:

1. INSTALL THE ENDS OF THE SILT FENCE TO POINT SLIGHTLY UPSLOPE TO PREVENT SEDIMENT FROM FLOWING AROUND THE ENDS OF THE FENCE.
2. SPLICES SHALL NEVER BE PLACED IN LOW SPOTS OR SUMP LOCATIONS. IF SPLICES ARE LOCATED IN LOW-LYING OR SUMP AREAS, THE FENCE MAY NEED TO BE REINSTALLED UNLESS THE PROJECT ENGINEER APPROVES THE INSTALLATION.
3. SPLICED FENCE SECTIONS SHALL BE CLOSE ENOUGH TOGETHER TO PREVENT SILT LADEN WATER FROM ESCAPING THROUGH THE FENCE AT THE OVERLAP.

1 / C-4 TEMPORARY SILT FENCE
NOT TO SCALE



NOTES:

1. MATERIALS WITHIN THE DEWATERING PAD SHALL BE COVERED WITH 10-MIL PLASTIC SHEETING AT ALL TIMES.
2. DEWATERING PAD SHALL BE SLOPED (INCLUDES HDPE LINER) TOWARD COLLECTION SUMP TO FACILITATE COLLECTION AND REMOVAL OF LIQUIDS. LIQUIDS SHALL BE PUMPED FROM COLLECTION SUMP TO THE WATER TREATMENT SYSTEM.
3. UPON COMPLETION OF REMEDIAL CONSTRUCTION ACTIVITIES THE DEWATERING PAD, INCLUDING GEOSYTHETIC MATERIALS, SHALL BE REMOVED BY THE CONTRACTOR FOR OFF-SITE DISPOSAL.
4. SUBGRADE SURFACE SHALL BE UNIFORM AND FREE OF DELETERIOUS MATERIALS (E.G., SHARP AND/OR ANGULAR STONES, WOODY DEBRIS, CONSTRUCTION DEBRIS, SHARP OBJECTS) THAT COULD DAMAGE THE HDPE LINER. PARTICLES LARGER THAN APPROXIMATELY 1.0 INCHES SHALL BE REMOVED FROM SUBGRADE SURFACE PRIOR TO PLACEMENT OF GEOTEXTILE AND LINER.
5. COMPACT SUBGRADE SHALL PROVIDE A FIRM AND UNIFORM SURFACE. PLACE AND COMPACT GENERAL FILL AS NECESSARY FOR GRADING AND TO PROVIDE UNIFORM SURFACE. COMPACTION OF FILL MATERIAL ABOVE GEOSYNTHETIC MATERIALS SHALL BE PERFORMED IN A MANNER AND USING APPROPRIATE EQUIPMENT THAT AVOIDS DAMAGING THE GEOSYNTHETIC MATERIALS.
6. GRANULAR FILL FOR PLACEMENT ON LINER SHALL BE CAPABLE OF CONVEYING FLUIDS TO LIQUID COLLECTION SUMP. CONTRACTOR SHALL SELECT APPROPRIATE GRADATION. MAXIMUM PARTICLE SIZE NOT TO EXCEED 1.5 INCHES. USE FILL MATERIAL WITH SUBANGULAR (OR LESS ANGULAR) STONE.
7. CONTRACTOR MAY SUBMIT ALTERNATE METHOD OF DEWATERING FOR APPROVAL BY THE ENGINEER.
8. APPROPRIATE SIZE OF THE DEWATERING PAD SHALL BE DETERMINED BY THE CONTRACTOR.
9. TO AVOID DAMAGE TO THE HDPE LINER, NO HEAVY CONSTRUCTION EQUIPMENT SUCH AS TRUCKS, DOZERS, AND EXCAVATORS SHALL BE OPERATED DIRECTLY ON THE DEWATERING PAD.
10. DEWATERING PAD DETAILS SHOWN ABOVE PROVIDE MINIMUM REQUIREMENTS. CONTRACTOR SHALL UPGRADE DESIGN FEATURES AS NECESSARY TO PROVIDE APPROPRIATE CONTAINMENT (E.G., BERM HEIGHT SHALL BE ADJUSTED AS NECESSARY TO PROVIDE ADEQUATE CONTAINMENT OF LIQUIDS).
11. ADDITIONAL CONTAMINATED SOIL AND WATER MITIGATION DETAILS CAN BE FOUND IN THE STORMWATER POLLUTION PREVENTION PLAN, APPENDIX G OF THE CONSTRUCTION PLANS AND SPECIFICATIONS SUMMARY REPORT.

2 / C-4 CONTAMINATED SOIL DEWATERING PAD DETAIL AND TRENCH BOX DECONTAMINATION
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No.	Date	Revisions	By	Cko

Professional Engineer's Name: CARSTEN BECKER
Professional Engineer's No.: 39822

State	Date Signed	Project Mgr.
WA	09/21/16	B.MARCUM
Designed by: R. KILKENNY	Drawn by: A.REYES	Checked by: C. BECKER

ARCADIS U.S., INC.

FORMER INDUSTRIAL PETROLEUM DISTRIBUTORS • 1120 WEST BAY DRIVE NORTHWEST, OLYMPIA, WASHINGTON
CONTRACT DRAWINGS

DETAILS

ARCADIS Project No. GP09BPNA.WA60.K0000
Date: SEPTEMBER 2016

ARCADIS
1100 OLIVE WAY, SUITE 800
SEATTLE, WA 98102
TEL.206.726.4739

C-5

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APPENDIX F

Traffic Control Plan

BP West Coast Products, LLC

TRAFFIC CONTROL PLAN

Former ARCO Olympia Bulk Terminal
Industrial Petroleum Distributors Site
1120 West Bay Drive
Olympia, Washington 98502
Agreed Order DE 10470
F/S ID: 1436
Cleanup Site ID: 4240

September 16, 2016

CONTENTS

FIGURE

ATTACHMENTS

ACRONYMS AND ABBREVIATIONS

Arcadis	Arcadis U.S., Inc.
BP	BP West Coast Product, LLC
HASP	Health and Safety Plan
IPD	Industrial Petroleum Distributors
Mph	miles per hour
site	lowland portion of the former IPD Site located 1120 West Bay Drive in Olympia, Washington
TCP	Traffic Control Plan
UTV	utility vehicles

1 INTRODUCTION

On behalf BP West Coast Product, LLC (BP), Arcadis U.S., Inc. (Arcadis) prepared this Traffic Control Plan (TCP) to support the excavation of the lowland portion of the former Industrial Petroleum Distributors (IPD) site located at 1120 West Bay Drive in Olympia, Washington (the site).

Excavation activities will be performed in accordance with the Construction Plans and Specifications. This TCP is provided as Appendix F to the Construction Plans and Specifications Summary Report.

The purpose of this TCP is to prevent losses associated with motor-vehicle related incidents including: injuries to drivers, passengers, and pedestrians; damage to motor vehicles; and damage to third-party property while conducting work onsite. By communicating potential safety risks before mobilizing to the site, motor vehicle operators will be able to prepare for and avoid potential hazards.

This TCP describes traffic controls associated with proposed site activities and defines procedures for transporting soils and debris from the site to the designated processing and and/or disposal facilities. Traffic controls described in this TCP will be implemented to facilitate safe and efficient traffic flow onsite and on public roadways.

Because the configuration onsite may change during excavation activities, the TCP will be maintained and updated separate from the site-specific Health and Safety (HASP) Plan and will be revised accordingly. Prior to initiating project work, workers will sign the TCP Acknowledgment Form (Attachment 1). If revisions are made to the TCP, they will be documented on the Changes to the TCP Form (Attachment 2).

2 TRAFFIC OVERVIEW

Anticipated construction traffic for the project will include, but is not limited to, the following:

- Ten-wheel dump trucks and trailers;
- Eighteen-wheel belly-dump trucks;
- Flat-bed trucks;
- Pick-up trucks, cars or utility vehicles (UTV) for personnel transport; and

- Heavy equipment that has been approved for use as intended for the project by Arcadis.

Offsite deliveries to and from the site may include:

- Heavy equipment;
- Project materials; and
- Import fill and aggregate.

3 SITE ENTRANCE PROCEDURES

Procedures for accessing and driving at the site will be strictly adhered to by all contractor, subcontractor, and materials delivery personnel. All personnel will review this TCP and sign the TCP Acknowledgment Form (Attachment 1), indicating their knowledge of the TCP procedures and policies prior to performing work at the site.

3.1 Gate Entrance

Arcadis and subcontractor personnel will enter the site via West Bay Drive from the south. All Arcadis and subcontractor personnel are required to check in with Arcadis onsite personnel. All non-construction related vehicles (e.g., personal vehicles) will park on the east side of the site, as shown on Figure 1.

Only vehicles approved by the Arcadis site supervisor will enter the active work zone, defined as the areas contained within the chain-link fence (Figure 1). At all times, these vehicles will strictly adhere to the health and safety procedures established in the HASP.

Chain-link fencing will be installed around the excavation for security purposes due to the recreational land use of the surrounding area. Site security will be established by the excavation contractor and may include installing temporary chain-link fence around the exterior footprint of the proposed excavation while still allowing room for equipment movement. A lockable construction access gates will be installed and used to secure the site when personnel are offsite or during non-working hours.

Drivers of dump trucks and other construction-related vehicles will not be allowed to exit the cab of the vehicles at any time within the active work zone without wearing appropriate personal protective equipment, as defined in the HASP.

3.2 Driving Policies

Arcadis adheres to a zero-tolerance policy against cell phone usage while operating motor vehicles. Prior to retrieving voicemail messages or initiating or answering cell phone calls, all drivers must stop their vehicle in a safe location off the road and away from traffic, both onsite and offsite.

Speed limits will be strictly enforced for all construction-related traffic. Speed limits for roads to be used are as follows or as posted:

- Onsite: 10 miles per hour (mph);
- West Bay Drive: 30 mph;
- Interstate 5: 60 mph.

Once the disposal facility is determined, this TCP will be updated to include additional roadways to be used.

3.3 Emergency Evacuation Procedures

Emergency evacuation information is provided in the HASP and will be reviewed and signed by all Arcadis and subcontractor personnel prior to performing any work at the site.

3 ONSITE TRAFFIC

4.1 Onsite Hazardous Materials Loading Route

Figure 1 shows one potential traffic route for all trucks loading and transporting excavated soils from the site.

Empty truck traffic will enter the site via West Bay Drive from the south and proceed just northwest of the stabilized construction entrance ramp, through the gate and into the active work zone. Upon entering the active work zone, trucks will:

- Proceed to the right (east) from the gate along the northern side of the chain-link fence;
- Heading right (east), make a right and head south along the chain link fence;

- Take a right and head northeast until the truck is oriented parallel to the contaminated soil staging area;

- After loading, exit at the gate entrance and head south out to West Bay Drive.

Drivers must be cautious of foot traffic and other heavy machinery while driving through the active work zone.

4.2 Waste Management Facility

The waste management facility will be identified prior to excavation activities and the route will be determined at that time.

5 SIGNAGE

Warning signs indicating “Trucks Entering Roadway” will be placed along West Bay Drive, near the stabilized construction entrance ramp. Signs will be placed along both the northbound and southbound lanes to warn traffic in both directions.

FIGURE

THIS MAP PREPARED FROM FIELD SURVEYS BY OTAK IN AUGUST OF 2015.

GRAPHIC SCALE: 1 in. = 20 ft. (0, 20', 40')

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THIS DRAWING IS THE PROPERTY OF THE ARCADIS ENTITY IDENTIFIED IN THE TITLE BLOCK AND MAY NOT BE REPRODUCED OR ALTERED IN WHOLE OR IN PART WITHOUT THE EXPRESS WRITTEN PERMISSION OF SAME.

Professional Engineer's Name		
Professional Engineer's No.		
State: WA	Date Signed	Project Mgr.: B.MARCUM
Designed by: M.PERKINS	Drawn by: A.REYES	Checked by

DRAFT

ARCADIS Design & Consultancy for natural and built assets

ARCADIS U.S., INC.

FORMER INDUSTRIAL PETROLEUM DISTRIBUTORS • 1120 WEST BAY DRIVE, OLYMPIA, WASHINGTON

CONSTRUCTION PLANS AND SPECIFICATIONS

ONSITE TRAFFIC ROUTE

ARCADIS Project No. GP09BPNA.WA60.K0000

Date DECEMBER 2015

ARCADIS
1100 OLIVE WAY, SUITE 800
SEATTLE, WA 98102
TEL.206.726.4739

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ATTACHMENT 1

Traffic Control Plan Acknowledgement Form

ARCADIS Design & Consultancy for natural and built assets

Traffic Control Plan Acknowledgement Form

Name	Date	Signature

ATTACHMENT 2

Changes to the Traffic Control Plan

ARCADIS Design & Consultancy for natural and built assets

Changes to the Traffic Control Plan Form

Name _____ **Date** _____

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ARCADIS Design & Consultancy for natural and built assets

APPENDIX G

Stormwater Pollution Prevention Plan

ARCADIS Design & Consultancy for natural and built assets

BP West Coast Products, LLC

STORMWATER POLLUTION PREVENTION PLAN

Relevant Portions of SWPPP

Former ARCO Olympia Bulk Terminal
Industrial Petroleum Distributors Site
1120 West Bay Drive
Olympia, Washington 98502
Agreed Order DE 10470
F/S ID: 1436
Cleanup Site ID: 4240

January 2016

CONTENTS

ATTACHMENTS

1 INTRODUCTION

A Pre-Excavation Soil Sampling and Excavation Work Plan (Work Plan) has been prepared in accordance with Agreed Order No. DE 10470 between Atlantic Richfield Company (ARCO) and the Washington State Department of Ecology (Ecology) for the planned subsurface investigation and remedial activities at the lowland potion of the former Industrial Petroleum Distributers site, generally located at 1120 West Bay Drive in Olympia, Washington (site). The sampling and remedial activities outlined in the Work Plan include pre-excavation soil sampling to delineate the vertical and horizontal extents of impacted soil and remedial excavation to remove areas of impacted soil within the Port of Olympia property and Burlington Northern Santa Fe (BNSF) right of way (ROW).

This SWPPP relevant sections were developed in accordance with the requirements of the National Pollutant Discharge Elimination System (NPDES) and State Waste Discharge General Permit for Stormwater Discharges Associated with Construction Activity, herein referred to as the General Permit. As required by the General Permit, the SWPPP must be completed prior to initiating remedial activities. A copy of the General Permit is provided in Attachment A.

This SWPPP has been prepared to ensure that all reasonable efforts are employed during the execution of the remedial activities to:

1. Reduce the potential for stormwater contamination.
2. Control sedimentation and erosion.
3. Protect surface waters.

Details of the remedial activities are provided in the Work Plan. In addition, the following sections describe the Best Management Practices (BMPs) to be employed at the site during the remedial activities to ensure the above objectives are met. A copy of this SWPPP must be located on the site or within reasonable access and a copy of the SWPPP drawings must be kept on the site at all times.

2 EXISTING SITE CONDITIONS

The site is located in west-central Washington in Thurston County on the southern end of Budd Inlet in Puget Sound, includes two parcels of land (Parcel Nos. 0903-000-5000 and 0903-000-3000) on the west side of West Bay Drive and is affiliated with a lowland parcel that has been assigned Parcel No. 0903-000-1000 by Thurston County. The Work Plan addresses the lowland parcel, which is located at 1120 West Bay Drive in Olympia, Washington on the east side of West Bay Drive. A Site Vicinity Map is presented on Figure 1 of the Construction Plans and Specifications Summary Report. The majority of the site is currently owned by the Port of Olympia, with a 0.02-acre parcel located on the west side of the site owned by BNSF. The site was formerly used as a bulk petroleum distribution facility by ARCO and Industrial Petroleum Distributors (IPD) which provided infrastructure for a bulk petroleum storage facility (bulk plant) operated on the upland portion of the site, also owned by IPD. The site is currently vacant. The total work area is less than half an acre, and the area that will be excavated is between 1000 and 6500 square feet.

An underground pipeline on the northeast side of the site was used to transfer petroleum products (gasoline and oil) from barges into aboveground storage tanks located at the upland bulk plant. An abandoned pier originating on site previously extended approximately 400 feet into West Bay before being removed. The upland parcel was issued a No Further Action letter on June 25, 2003.

Outside the boundaries of the site, an industrial area with a warehouse sits to the north and West Bay Drive bounds the site to the west. On the eastern and southern edges, tidally influenced areas border Puget Sound.

2.1 Site History

The bulk terminal and site infrastructure have been out of use since approximately 1989. The former storage tanks associated with the bulk plant, which were located on the western upland parcel, were decommissioned and removed in 1999. Several independent consultants performed subsurface investigations at the site between 2000 and 2004 following the completion of a Limited Environmental site Assessment conducted by SECOR in 2000 on behalf of ARCO Products, Inc. The site investigations focused on the north side of the lowland parcel near the underground pipeline formerly used to transfer petroleum products. A total of 15 soil samples (IPD-1 through IPD-6, S-1 through S-6, and WBTP-01 through WBTP-03) were collected at depths ranging from 2.5 feet to 7 feet bgs. Grab groundwater samples were collected from 10 of these locations (IPD-1 through IPD-5, W-1[S-1] and W-2 [S-2], and WBTP-01 through WBTP-03 [SECOR, 2000]). Soil and groundwater samples collected as a result of these site investigations were submitted for analysis of petroleum hydrocarbon constituents and metals. The results of the historic investigations detected petroleum constituents including total petroleum hydrocarbons–diesel range organics (TPH-DRO), total petroleum hydrocarbons-heavy oil range organics (TPH-HO), metals and volatile organic compounds (VOCs) in both soil and groundwater samples.

2.2 Soils

The site is situated on West Bay, located on the southern end of Budd Inlet in Puget Sound. Puget Sound is located in the Puget Trough, which is bordered by the Cascade Range to the east and the Coast Range to the west. The site is located in a geographic area known as the Puget Sound lowlands, on an area of Pleistocene-age glacial recessional outwash. The recessional outwash forms a layer ranging from a few feet to 150 feet thick and is characterized as poorly sorted, discontinuously bedded loose gravel with some sand, silt, and clay (Washington State Department of Water Resources 1970).

The soils within the site are classified as xerorthents, which are characterized as sandy and loamy cut and fill material. There is no hydrologic group classification, but they are considered somewhat excessively drained (USDA, 2015).

Subsurface material observed during site investigation activities generally consist of silty clays and sandy silt to approximately 6 feet below ground surface (bgs) and fine to medium sand and fine gravel between 6 and 13 feet bgs. Wood debris and bark dust were observed between 3 and 9 feet bgs. Observed subsurface conditions are consistent with the location of the site adjacent to West Bay and are indicative of historical glacial deposition.

2.3 Topography

The site elevation is approximately mean sea level, and the topography of the immediate area is generally flat, with a slope towards West Bay. To the west, slopes increase substantially to the top of the bluff that runs parallel to West Bay. The site is bordered by Puget Sound to the east and south.

2.4 Site Hydrology

Nearby streams include Schneider Creek to the north and an unnamed stream to the south, both of which discharge into Puget Sound. Steep slopes are present on the western side of West Bay Drive with potential surface flow and ephemeral channels. Impervious areas in the vicinity of the site include the industrial site to the north of the work area, West Bay Drive to the west, and parking lots and a building on the west side of West Bay Drive, across from the site. Downgradient of the site to the south and east are tidal flats that are part of Puget Sound.

Historical groundwater elevations, tidal stages during sampling events, and groundwater electrical conductivity readings have been evaluated to determine if brackish bay water is intruding into groundwater on site. ARCADIS presented a detailed evaluation of tidal influence on the hydrogeology of the site in the RI Report (ARCADIS 2012). Groundwater gradient at the site is generally toward the southeast towards West Bay at a flow approximately 0.033 and 0.031 foot/foot (ft/ft) at high and low tides, respectively. Groundwater in wells MW-7, MW-8, and MW-9 are likely experiencing influence from brackish bay water based on an evaluation of electrical conductivity and their proximity to the bay.

3 PROJECT DESCRIPTION

This section describes the remedial activities to be conducted at the site. The primary remedial objectives are to remove impacted soils in the lowland portion of the former bulk terminal site in a safe and efficient manner that is compliant with all local, state and federal regulations. Once impacted soils are removed, excavated areas will be backfilled and returned to the current grade. A comprehensive overview of the planned site activities is presented in the Work Plan (ARCADIS 2015). Project extents and structures are shown on Figure C-1 of the Construction Plans and Specifications.

3.1 SWPPP Team

Contact information for individuals responsible for SWPPP implementation on this project and their respective responsibilities are provided in Table 1 below.

Table 1 Individual Contact Information for SWPPP Team

Member	Contact Information	Responsibilities
ARCADIS Project Manager	Brian Marcum 111 SW Columbia St., Suite 670 Portland, OR 97201	• Notify contractor(s) of stormwater requirements applicable to the work • Amend this SWPPP as required by changing conditions and/or remedial actions (RAs)

Table 1 Individual Contact Information for SWPPP Team

Member	Contact Information	Responsibilities
ARCADIS Construction Field Manager	TBD	• Notify contractor(s) of stormwater requirements applicable to the work • Amend this SWPPP as required by changing conditions and/or RAs • Complete logs required in this SWPPP • Retain the original SWPPP and related documents (e.g., inspection forms) on site • Ensure that contractor/site supervisors each have an up-to-date copy of the SWPPP
Contractor Site Supervisor	TBD	• Follow housekeeping best management practices (BMPs) and correctly install erosion and sediment control BMPs as described in this SWPPP and as determined by the Field Manager • Provide materials for implementation of the BMPs in accordance with this SWPPP and the project specifications • Notify subcontractor(s) employed by the Contractor of stormwater requirements applicable to the work • Correct deficiencies as soon as possible and no later than 5 days after inspection or prior to next rain event, whichever is sooner
Emergency 24-Hour Contact	TBD	• Coordinate emergency response activities
SWPPP Preparer	Myles Perkins, P.E. 1100 Olive Way, Suite 800 Seattle, WA 206.726.4756 Myles.Perkins@arcadis-us.com	• Provide additional information to the SWPPP Team as needed

Contractors not identified in this plan must read and sign the Contractor Certifications and Agreements form for this SWPPP prior to commencing soil disturbance or other activities on the site that have the potential to negatively impact stormwater quality. A Contractor Site Supervisor will be assigned to the site.

3.2 Potential Sources of Pollution

Potential sources of sediment to stormwater runoff include:

1. Material removal/re-contouring
2. Clean material delivery

3. Stockpiles
4. Clean material placement
5. Erosion from water used for dust suppressant
6. Vehicle tracking

Potential pollutants and sources, other than sediment, to stormwater runoff are summarized in Table 2 below.

Table 2 Potential Pollutants and Sources

Material/Chemical	Stormwater Pollutants	Location On-Site Where Material May Be Used
Gasoline	Benzene, toluene, ethylbenzene, and total xylenes (BTEX); methyl tertiary-butyl ether (MTBE)	Staging area and leaks from vehicles and equipment
Diesel Fuel	Petroleum distillate, oil & grease, naphthalene, xylenes	Staging area and leaks from large equipment
Antifreeze/coolant	Ethylene glycol, propylene glycol, heavy metals (copper, lead, zinc)	Staging area and leaks from large equipment
Trash	Miscellaneous litter	Staging area
Existing and Construction Debris	Miscellaneous litter and construction debris	Existing piles of debris in various areas that will be consolidated beneath a cover system
Sanitary Toilets	Bacteria, parasites, and viruses	Staging area
Equipment Decontamination	Hydrocarbons from soils/mine wastes, miscellaneous vehicle oils	Equipment decontamination pads as shown on Design Drawings
Revegetation Operations	Nutrients, trash debris, and solids	Earth disturbed areas

3.3 Protection of Site Features and Sensitive Areas

Site features/sensitive areas to be protected during construction are listed below, along with a brief summary of the proposed protective/mitigation measures for those features.

7. Puget Sound:
    - Primary objective of BMPs discussed in this SWPPP.
8. Soils surrounding the work area:
    - Avoid adversely impacting adjacent areas by using appropriate BMPs (e.g., decontamination procedures).

3.4 Drawings

Figures showing BMP designs, included in the Construction Plans and Specifications, have been prepared in accordance with the substantive requirements of the General Permit. The Construction Plans and Specifications (CPS) drawings meet applicable requirements as specified in the 2012 Stormwater Management manual for Western Washington. The CPS is included as Attachment B.

4 CONSTRUCTION BMPS

To ensure measures necessary to effectively manage stormwater during construction activities, minimum requirements for construction BMPs will be implemented in accordance with Volume 2 of the 2012 Stormwater Management Manual for Western Washington, as amended in December 2014 (Ecology 2014). Construction BMPs to be implemented at this site are included as Attachment C.

4.1 Element 1: Preserve Vegetation/Mark Clearing Limits

To protect Puget Sound, and to reduce the area of soil exposed to construction, the limits of construction will be clearly marked before land-disturbing activities begin. Vegetation that must be removed will be replaced in accordance with the Work Plan, Design Drawings, and Technical Specification requirements following remedial activities. Natural vegetation will be preserved to the greatest extent possible to limit erosion (BMP C101). The project clearing limits will be clearly delineated to avoid inadvertent clearing or removal of desirable vegetation with high visibility chain link fence and silt fencing. Where vegetation must be removed for grading activities, temporary soil stabilization measures will be implemented as described in the following section. The BMPs relevant to marking the clearing limits that will be applied to this project include:

- Preserving Natural Vegetation (BMP C101)
- Buffer Zones (BMP C102)
- High Visibility Plastic or Metal Fence (BMP C103)
- Silt Fence (BMP C233)

4.2 Element 2: Establish Construction Access

Access from West Bay Drive to the east is at a higher elevation before a gradual drop to the site. Trucks and trailers shall be limited to this entrance/exit during construction activities. A rock construction entrance/exit pad of crushed rock or stone will be placed at the entrance/exit from the construction area to minimize vehicle tracking of dirt or mud to off-site areas. The exit will provide adequate turning radius (minimum of 55 feet in width) where it meets existing roads. Rock construction entrances/exits will be inspected for evidence of tracking dirt or mud onto off-site areas. Materials spilled, dropped, washed, or tracked from vehicles onto roadways or into storm drains will be removed immediately. The entrances/exits will be maintained in a condition that will prevent tracking or flow of mud onto off-site areas, which may require the periodic top dressing with additional 2 inches of stone (as conditions demand). If sediment is tracked off-site, the affected roadway will be cleaned in a timely manner to ensure sediment does not get transported off-site. The BMPs relevant to establishing construction access that will be applied to this project include:

- Stabilized Construction Entrance/Exit (BMP C105)

4.3 Element 3: Control Flow Rates

Stormwater flow onto the site will be diverted via silt fencing and sand bags. Due to the topography of the site and relatively small excavation footprint, concentrated flows are not anticipated onsite. Water that directly contacts the site due to rain or dust suppression methods will either infiltrate or accumulate along silt fencing to the south and east. If surface water accumulation is observed outside the excavation during construction activities, dewatering will be conducted via vacuum truck and stored temporarily onsite in a polyethylene storage tank if needed. Accumulated water will be transported off site for disposal at a licensed facility.

4.4 Element 4: Install Sediment Controls

Erosion and sediment controls will be installed and maintained in accordance with the project documents and the latest edition of the Stormwater Management Manual for Western Washington (Ecology 2014). Temporary erosion and sediment control measures will be installed prior to initiation of soil-disturbing activities. The Contractor will also be responsible for providing additional erosion and sediment control measures, as needed, to achieve the stormwater management objectives of this SWPPP.

Silt fences will be used near the perimeter of disturbed areas and at grade breaks to intercept sediment and will remain in place until the disturbed area upgradient of the silt fence is permanently stabilized (i.e., minimum uniform 70 percent coverage of vegetation is established). Silt fence will not be used in areas of concentrated flow. In soils that will prevent the full and uniform anchoring of the fence (i.e., extremely loose or rocky soils), alternative measures (e.g., appropriately sized straw wattles or straw bales) will be substituted. Silt fences will be inspected for ripped or torn filter fabric and fencing that has been undermined or topped. The BMPs relevant to establishing construction access that will be applied to this project include:

- Silt Fence (BMP C233)

4.5 Element 5: Stabilize Soils

Soil disturbance will be minimized by limiting soil exposure to the least amount that is feasible. Soil stockpiles will be protected and located away from storm drains, waterways, and drainage channels, to the maximum extent possible.

Equipment will be tracked perpendicular to the direction of the contour slopes (or other grading techniques), where practicable, to reduce the velocity of runoff, increase infiltration, and trap sediment by creating horizontal grooves, furrows, depressions, or steps running parallel to the slope contour on the face of the slope.

The project is located west of the Cascade Mountain Crest. As such, no soils shall remain exposed and unworked for more than 7 days during the dry season (May 1 to September 30) and 2 days during the wet season (October 1 to April 30).Temporary seeding will be applied to disturbed areas where earthwork activities will be temporarily suspended for a period of 7 days or longer unless, due to time of year or other factors, adequate and appropriate alternate erosion and sediment control measures are installed

(e.g., silt fencing, wattles, mulch). Regardless of the time of year, exposed soils shall be stabilized at the end of the shift before a holiday or weekend if needed based on weather forecasts.

Permanent seeding will be established to reduce the long-term potential for erosion and sediment transport from disturbed or bare soil areas and to provide a protective cover following achievement of final grades. The seed mix will consist of native plants. Permanent seeding will be conducted following the permanent cessation of earth-disturbing activities (i.e., final grading). Areas of temporary and permanent seeding will be inspected for erosion. Areas where soils or seed have been washed away will be filled and regraded (as necessary), reseeded, and mulched; or stabilized with additional measures (e.g., erosion control mats, straw wattles). Inspections will be performed until a minimum uniform 70 percent coverage of vegetation is established.

Fertilizer and mulch will be applied to seeded areas to facilitate the establishment of vegetative cover. Discharges of fertilizers containing nitrogen or phosphorus will be minimized by applying fertilizer at a rate and quantity consistent with the manufacturer's specifications during the appropriate time of year for the site location, and in accordance with local, state, and federal requirements. In addition, fertilizer will not be applied to frozen ground, stormwater conveyance channels with flowing water, or prior to heavy rains that could cause a discharge of excess nutrients.

Stockpiled soils will be temporarily covered with plastic sheeting, if not removed from site, at the end of each day. Stockpiled soils shall be stabilized from erosion, protected with sediment trapping measures, and where possible, be located away from storm drain inlets, waterways, and drainage channels.

Upon completion of final grading activities, disturbed soil areas will be hydroseeded. Following hydroseeding, the areas will be mulched and a tackifier applied. The BMPs relevant to stabilizing soils that will be applied to this project include:

- Temporary and Permanent Seeding (BMP C120)
- Surface Roughening (BMP C130)
- Plastic Covering (BMP C123)

4.6 Element 6: Protect Slopes

Generally, the site is flat with little to no topographic relief. It is unlikely that significant cuts or slopes will be created during construction activities as a result of the excavation portions of this project. If cuts or fill slopes are created they will be designed, constructed, and protected in a manner that minimizes erosion. Stockpiled soils onsite will be temporarily covered with plastic sheeting, if not removed from the site, at the end of each day. The BMPs relevant to protecting slopes that will be applied to this project include:

- Temporary and Permanent Seeding (BMP C120)
- Surface Roughening (BMP C130)
- Plastic Covering (BMP C123)

4.7 Element 7: Protect Drain Inlets

Storm drain inlets and culverts made operable during construction will be protected to prevent unfiltered or untreated water from entering the drainage conveyance system. The first priority is to keep access roads clean of sediment and keep street wash water from entering storm drains until treatment can be

provided. Storm Drain Inlet Protection (BMP C220) will be implemented for drainage inlets along West Bay Drive that could potentially be impacted by sediment-laden runoff near the project site construction entrance.

4.8 Element 8 Stabilize Channels and Outlets

Generally, the site is flat with little to no topographic relief. It is unlikely that on-site conveyance channels will be needed during construction activities as a result of the anticipated excavation footprint. If channels and outlets are created, they will be designed, constructed, and stabilized in a manner that minimizes erosion and can handle a peak volumetric flow rate calculated using a 10-minute time step from a Type 1A, 10- year, 24-hour frequency storm for the development conditions.

4.9 Element 9: Control Pollutants

During construction, the remedial Contractor will be responsible for maintaining the site in a neat and orderly fashion including, but not necessarily be limited to, routine waste management activities (including the collection and disposal of trash, rubbish, construction waste, and sanitary wastes); prompt cleanup of spills of liquid or dry materials (if any); and prompt cleanup of sediments inadvertently tracked by construction vehicles and/or transported by wind or stormwater from active work areas to other areas of the site or nearby off-site areas. Waste containers of sufficient size and number to contain construction and domestic wastes will be provided and adequately covered from precipitation. On work days, waste will be cleaned up and disposed of in designated waste containers; and if containers overflow, the waste will be cleaned up immediately. Sanitary facilities will be located and secured such that the facilities cannot be tipped or knocked over.

Construction material storage areas will be provided with either: (i) cover (e.g., plastic sheeting or temporary roofs) to prevent products from coming into contact with precipitation; or (ii) a similarly effective means designed to prevent the discharge of pollutants from these areas (e.g., spill kits). Diesel fuel, lubricants, hydraulic fluids, other petroleum products, and other chemicals will be stored in water-tight containers and covered. Spills of petroleum products or other chemicals will be cleaned up immediately using dry cleanup methods, where possible.

If equipment or vehicles are fueled and/or maintained at the site, an effective means to prevent the discharge of spilled or leaked chemicals (including fuel) from the area where these activities take place will be provided. To reduce the potential for the discharge of fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance, Material Delivery, Storage and Containment (BMP C153) will be implemented.

In the event of a leak, spill, or other release containing a hazardous substance or oil into waters of the state on onto land with a potential for entry into state waters, including groundwater, the National Response Center (1-800-424-8802) and the Washington Emergency Management Division (1-800-258-5990) will be notified immediately.

4.9.1 Impacted Soils Management

Soil that is impacted with petroleum hydrocarbons will be stockpiled with a berm lined 20-mil plastic liner. Stockpiles will be covered with plastic at the end of each work day and during times of precipitation to insure that rainwater does not contact impacted soil and become contaminated. Catch basins in the area of the stockpile area will be plugged to ensure that stormwater does not enter the storm system and covered to ensure that soil does not enter the storm system. Excess water that accumulates in the soil storage area will be containerized via vacuum truck and stored temporarily on site in a polyethylene storage tank if needed. Accumulated water will be transported off site for disposal at a licensed facility.

4.9.2 Vehicles, Construction Equipment, and/or Petroleum Product Storage/Dispensing

Vehicles, equipment, and petroleum product storage/dispensing areas will be inspected regularly to detect leaks or spills, and to identify maintenance needs to prevent leaks or spills. On-site fueling tanks and petroleum product storage containers shall include secondary containment. Spill prevention measures, such as drip pans and funnels, will be used when conducting maintenance and repair of vehicles or equipment. In order to perform emergency repairs on site, temporary plastic will be placed beneath and, if raining, over the vehicle. Contaminated surfaces shall be cleaned immediately following discharge or spill incident.

4.9.3 Chemical Storage

It is not expected that large quantities of chemicals will be stored onsite. If it is necessary to do so, chemicals will be stored in a secure area within a covered secondary containment structure.

Chemicals stored in the construction areas will conform to the appropriate source control BMPs listed in Volume IV of the Ecology stormwater manual. In Western WA, chemicals shall have cover, containment, and protection provided on site, per BMP C153 for Material Delivery, Storage and Containment in SMMWW 2005.

4.9.4 Spill Response

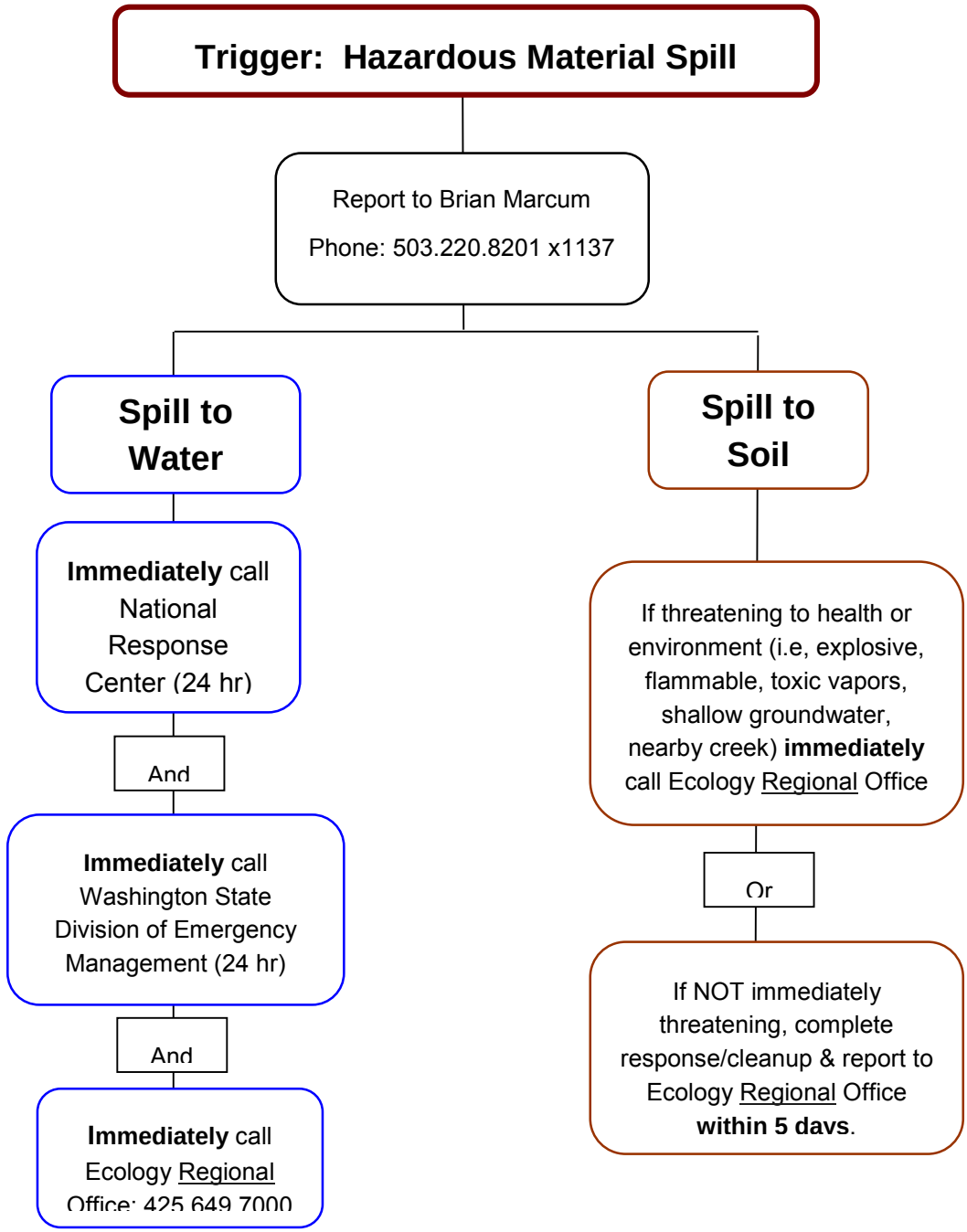
The following tables indicate the minimum amount of spill response and clean up materials that will be kept onsite, the external notification reference list, and the reporting structure for spills to soil and water:

Table 3. Spill Response Equipment

Equipment / Material	Minimum Quantity On Site During Project
Spill Response Kits	1, sealed
Empty 55-gallon drums with labels	5
Shop Cloths	2 full containers
Oil Sorbent Pads	250 sealed in 5 sealed spill kits plus a minimum of 100 additional in two extra containers

Oil Booms	20 in 5 sealed spill kits
“Kitty Litter”	5 - 50-pound bags
Straw Bales	As needed
Silt Fencing	As needed
Wattles	Enough to surround all storm drain inlets and manholes onsite.
Polyethylene Bags	20
Plastic Sheeting	1,000 square feet
PPE Sets	5

In the event of a hazardous materials spill, the following steps and procedures will be taken to ensure the proper authorities are notified:


Trigger: Hazardous Material Spill
Report to Brian Marcum
Phone: 503.220.8201 x1137
Spill to Water
Spill to Soil
Immediately call National Response Center (24 hr)
And
Immediately call Washington State Division of Emergency Management (24 hr)
And
Immediately call Ecology Regional Office: 425 649 7000
If threatening to health or environment (i.e, explosive, flammable, toxic vapors, shallow groundwater, nearby creek) immediately call Ecology Regional Office
Or
If NOT immediately threatening, complete response/cleanup & report to Ecology Regional Office within 5 days.

4.10 Element 10: Control De-Watering

Groundwater has been encountered at approximately 2 to 7 feet bgs, with little seasonal variation. Groundwater containing sheen or light nonaqueous phase liquid (LNAPL) will be containerized. Based on previous site investigations, sheen or LNAPL is not expected to be encountered during excavation activities. If dewatering during excavation is required, it will be conducted via vacuum truck and stored temporarily on site in a polyethylene storage tank if needed. Accumulated water will be transported off site for disposal at an appropriately licensed facility.

4.11 Element 11: Maintain BMPs

Temporary and permanent erosion and sediment control BMPs shall be maintained and repaired as needed to assure continued performance of their intended function. Maintenance and repair shall be conducted in accordance with each particular BMP's specifications. Visual inspections of the BMPs will be conducted at least once every calendar week and within 24 hours of a rainfall event that causes a discharge from the site. If the site becomes inactive, and is temporarily stabilized, the inspection frequency will be reduced to once every month.

Temporary erosion and sediment control BMPs shall be removed within 20 days after the final site stabilization is achieved or after the temporary BMPs are no longer needed. Trapped sediment shall be removed or stabilized on site. Disturbed soil resulting from removal of BMPs or vegetation shall be permanently stabilized.

4.12 Element 12: Manage the Project

As the project site is located west of the Cascade Mountain Crest, the project will be managed according to the following key project components:

Phasing of Construction

The project is being phased to the extent practicable in order to prevent soil erosion and, to the maximum extent possible, the transport of sediment from the site during construction (BMP C162: Scheduling).

Seasonal Work Limitations

From October 1 through April 30, clearing, grading, and other soil disturbing activities shall only be permitted if shown to the satisfaction of the local permitting authority that silt-laden runoff will be prevented from leaving the site through a combination of the following:

- Site conditions including existing vegetative coverage, slope, soil type, and proximity to receiving waters; and
- Limitations on activities and the extent of disturbed areas; and
- Proposed erosion and sediment control measures.

Based on the information provided and/or local weather conditions, the local permitting authority may expand or restrict the seasonal limitation of site disturbance.

Inspection and Monitoring

BMPs shall be inspected at a minimum of once per week, and maintained and repaired as needed to assure continued performance of their intended function. Site inspections shall be conducted by a person who is knowledgeable in the principles and practices of erosion and sediment control. This person has the necessary skills to:

- Assess the site conditions and construction activities that could impact the quality of stormwater, and
- Assess the effectiveness of erosion and sediment control measures used to control the quality of stormwater discharges.

A Certified Erosion and Sediment Control Lead (CESCL) shall be on-site or on-call at all times. Whenever inspection and/or monitoring reveals that the BMPs identified in this SWPPP are inadequate, due to the actual discharge of or potential to discharge a significant amount of pollutant, appropriate BMPs or design changes shall be implemented as soon as possible.

Maintaining Construction SWPPP

This SWPPP shall be retained on-site. The SWPPP shall be modified whenever there is a change in the design, construction, operation, or maintenance at the construction site that has, or could have, a significant effect on the discharge of pollutants to waters of the state.

The SWPPP shall be modified if, during inspections or investigations conducted by the owner/operator, or the applicable local or state regulatory authority, it is determined that the SWPPP is ineffective in eliminating or significantly minimizing pollutants in stormwater discharges from the site. The SWPPP shall be modified as necessary to include additional or modified BMPs designed to correct problems identified. Revisions to the SWPPP shall be completed within seven (7) days following the inspection.

5 SEQUENCE OF CONTRUCTION ACTIVITIES

The purpose of this section is to outline the general sequence of activities that will take place prior to, during, and following remedial activities at the site with regard to the implementation of erosion and sediment control measures. The anticipated duration to complete the remedial activities is approximately 1-2 weeks, depending on the timing of initiation of activities, results of the pre-excavation sampling, and subsequent vertical and horizontal extent of the excavation. Specific construction activity sequencing may change depending on field conditions. ARCADIS will work with the remedial Contractor performing the work to ensure that changes to the sequence will be protective of stormwater quality. The sequence of activities will include the following items:

1. Hold pre-construction meeting prior to mobilization.
2. Begin Contractor mobilization.
3. Establish work areas, stockpile/staging areas, and limits of clearing.
4. Establish vehicle and equipment parking areas.

5. Identify and mark utilities and other critical site features (such as wells) to be protected.
6. Install erosion and sediment controls per the requirements of this SWPPP (see Figures C-01 and C-02).. The primary controls to be installed first will include the silt fence followed by the rock construction entrances/exits.
7. Perform pre-construction site assessment to confirm that appropriate erosion and sediment controls are in place and properly installed.
8. Install temporary access controls to construction areas (i.e., temporary fencing, cones, construction tape, and concrete barriers).
9. Initiate remedial excavation and perform backfilling and surface regrading
    - Perform weekly inspections and within 24 hours of a storm event of 0.25 inch or greater, in accordance with this SWPPP and the General Permit, to confirm that erosion and sediment controls are installed, being maintained, and are suitable to meet the objectives of this SWPPP.
10. Prepare seedbeds (e.g., topsoiling, surface roughening, and amendment placement) as areas of soil cover achieve final grades.
11. Apply perennial seed and mulch to prepared areas of soil cover per the Technical Specifications.
12. Remove construction equipment, materials, support facilities, temporary erosion and sediment controls, and project-derived waste from the site after final stabilization.
13. Perform final site inspection and remove remaining temporary erosion and sediment controls (e.g., silt fence).
14. Complete remedial contractor demobilization.

Prior to initiating the construction activities identified above, the remedial contractor will prepare a detailed construction schedule that will include the following milestones dates/timeframes: 1) installation of stormwater control measures and bringing the measures online; 2) commencement and duration of earth-disturbing activities; 3) cessation, temporarily or permanently, of construction activities on the site, or in designated portions of the site; 4) final or temporary stabilization of areas of exposed soil; and 5) removal of temporary stormwater conveyances/channels and control measures, removal of construction equipment/vehicles, and cessation of pollutant-generating activities.

The remedial contractor will sequence construction events in an effort to minimize the time that soil and stockpiled materials are exposed. Whenever possible, construction work will be scheduled during periods of dry weather and favorable soil moisture conditions. Erosion and sediment control measures will be scheduled or timed in stages to coincide with construction sequencing. Furthermore, where feasible, excavation will proceed from the most upgradient portion to the most downgradient, and the more elevated portions of the site will be stabilized to the maximum extent practicable before work begins in downgradient portions of the site.

6 DISCHARGING TO 303(D) OR TOTAL MAXIMUM DAILY LOAD (TMDL) WATER BODIES

Budd Inlet, which is the closest downstream water body from the site, is listed as an impaired water body under Section 303(d) of the Clean Water Act. The following impairments observed in the sediment and fish tissue, are listed as Category 5, which requires a TMDL:

Sediment

- 1,2-Dichlorobenzene
- Anthracene
- Arsenic
- Benzo(a)pyrene
- Bis(2-Ethyhexyl) Phthalate
- Cadmium
- Chromium
- Chrysene
- Copper
- Dibutyl phthalate
- Dibenzo(a,h)anthracene
- Fluoranthene
- Fluorene
- Indeno(1,2,3-cd)pyrene
- Lead
- Mercury
- High Molecular Weight Polycyclic Aromatic Hydrocarbons (HPAH)
- Pentochlorophenol
- Phenol
- Pyrene
- Silver
- Zinc
- Benz(a)anthracene
- Low Molecular Weight Polycyclic Aromatic Hydrocarbons (LPAH)
- 2-Methylnaphthalene
- 4-Methylphenol
- Acenapthene
- Acenaphthylene
- Benzo[ghi]perylene
- Total Benzofluoranthenes (b+k+j)
- Butyl benzyl phthalate
- Di-N-Octyl Phthalate
- Dibenzofuran
- Naphthalene
- Phenanthrene

Tissue

- 2,3,7,8-TCDD
- Benz(a)anthracene
- Benzo(a)pyrene
- Benzo(b)fluoranthene
- Chrysene
- Dibenzo(a,h)anthracene
- Indeno(1,2,3-cd)pyrene

A TMDL has not been established for Budd Inlet, but is under development. Since no discharge is anticipated from the site, the excavation activities will not contribute to any impairment in Budd Inlet. In the event discharge is required, the SWPPP will be amended to incorporate the changes necessary to be in compliance with the water quality standards for Budd Inlet prior to discharge.

7 INSPECTIONS

Erosion and sediment controls will be inspected as a quality control procedure to confirm that this SWPPP is being implemented properly and remains functional relative to site conditions. Prior to initiation of land-disturbing activities, a qualified person will perform a pre-construction site assessment to verify that erosion and sediment controls are properly installed and functional. The inspector will be CESCL certified per BMP C160. A site inspection checklist is provided in Attachment D.

During construction activities, site inspections will be conducted by a qualified person at least once every 7 calendar days or within 24 hours of the occurrence of a storm event of 0.25 inch or greater as required by Part 4.1.3 of the 2012 Construction General Permit (CGP). The following areas will be inspected during each site inspection, as necessary:

- Areas that have been cleared, graded, or excavated and that have not been permanently stabilized.
- Stormwater controls (including pollution prevention measures) installed at the site to comply with this SWPPP.
- Material, waste, borrow, or equipment storage and maintenance areas.
- Points of discharge from the site.
- Locations where stabilization measures have been implemented.

During the site inspection, the qualified person will review the following items:

- Check whether all erosion and sediment controls and pollution prevention controls are installed, are operational, and are working as intended to minimize pollutant discharges and determine if controls need to be replaced, repaired, or maintained.
- Check for the presence of conditions that could lead to spills, leaks, or other accumulations of pollutants on the site.
- Identify locations where new or modified stormwater controls are necessary to meet the requirements of this SWPPP.

- Check for signs of visible erosion and sedimentation that have occurred at and are attributable to points of discharge from the site.
- Identify incidents of noncompliance observed.
- Identify points of the site where there is a discharge and, if a discharge is occurring during the inspection, observe and document the visual quality of the discharge, document whether the stormwater controls are operating effectively, and describe controls that is not operating as intended or requires maintenance.

7.1 Inspection Reports

An inspection report will be completed following a site inspection, which will include the following information:

- The inspection date.
- Names and titles of personnel performing the inspection.
- A summary of the inspection findings, at a minimum covering the observations made in accordance with the inspection items noted above.
- The appropriate rain gauge or weather station readings that triggered the inspection, if applicable.
- Corrective actions required as a result of the inspection.
- If a portion of the site could not be inspected due to unsafe conditions, the report must include the reason for the unsafe conditions and the locations of the site to which the conditions applied.

Inspection reports will be signed by the qualified person and copies maintained on site with the SWPPP. Copies of the inspection reports will also be provided to the remedial contractor and to the ARCADIS Project Manager. The remedial contractor will be responsible for implementing corrective actions required based on the inspection report, with verification by the qualified person and the ARCADIS Project Manager.

7.2 Sampling Plan

Stormwater discharge offsite is not anticipated. If needed, this SWPPP will be amended to include compliance prior to offsite discharge. Discharge off site will be sampled in accordance with the Section S4 of the CGP. Sampling will be conducted as necessary in conjunction with site inspections at all points where stormwater or non-stormwater is discharged from the construction site. The following sections outline the monitoring and sampling procedures that will be used in the even that stormwater is discharged off-site.

7.2.1 Turbidity Sampling

Turbidity will be measured using a transparency tube or a turbidity meter.

If the discharge's turbidity is 26 to 249 NTU **or** the transparency is less than 33 cm but equal to or greater than 6 cm, the following steps will be conducted:

1. Review the SWPPP for compliance with Special Condition S9 of the CGP. Make appropriate revisions within 7 days of the date the discharge exceeded the benchmark.
2. Immediately begin the process to fully implement and maintain appropriate source control and/or treatment BMPs as soon as possible. Address the problems within 10 days of the date the discharge exceeded the benchmark. If installation of necessary treatment BMPs is not feasible within 10 days, Ecology may approve additional time when the Permittee requests an extension within the initial 10-day response period.
3. Document BMP implementation and maintenance in the site log book.

If the turbidity exceeds 250 NTU **or** the transparency is 6 cm or less at any time, the following steps will be conducted:

1. Telephone the applicable Ecology Region's Environmental Report Tracking System (ERTS) number within 24 hours.
2. Immediately begin the process to fully implement and maintain appropriate source control and/or treatment BMPs as soon as possible. Address the problems within 10 days of the date the discharge exceeded the benchmark. If installation of necessary treatment BMPs is not feasible within 10 days, Ecology may approve additional time when the Permittee requests an extension within the initial 10-day response period
3. Document BMP implementation and maintenance in the site log book.
4. Continue to sample discharges daily until one of the following is true:
    - Turbidity is 25 NTU (or lower).
    - Transparency is 33 cm (or greater).
    - Compliance with the water quality limit for turbidity is achieved.
        - 1 - 5 NTU over background turbidity, if background is less than 50 NTU
        - 1% - 10% over background turbidity, if background is 50 NTU or greater
    - The discharge stops or is eliminated.

7.2.2 pH Sampling

Based on the anticipated scope of work, pH sampling will not be required on site discharges. No concrete work or engineered soils will be used as part of the remedial activities.

8 CORRECTIVE ACTIONS

Corrective actions will be taken to repair, modify, or replace stormwater controls used at the site; cleanup and properly dispose of spills, releases, or other deposits; or remedy a non-compliance situation. For the following conditions identified at the site, new or modified controls will be installed and made operational or a repair to the controls will be completed no later than 7 calendar days from the time of discovery:

1. A required stormwater control was never installed, was installed incorrectly, or was not installed in accordance with the requirements of this SWPPP or the Design Drawings.
2. A required stormwater control has been damaged or is near or at design capacity.

3. It is discovered that the installed and maintained stormwater controls are not effective for the discharge to meet the applicable water quality standards
4. A prohibited discharge of (i) wastewater from washout and cleanout of concrete, stucco, paint, form release oils, curing compounds, and other construction materials; (ii) fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance; (iii) soaps, detergents, or solvents used in vehicle or equipment washing; or (iv) toxic or hazardous substances from a spill or release is occurring or has occurred.

8.1 Corrective Action Reports

For each corrective action taken in accordance with this SWPPP, a corrective action report will be completed. The following identifies the timeline for the development of corrective action reports.

After discovering the occurrence of one of the items identified above, a report will be submitted by the Contractor, with the following information generated and submitted to the ARCADIS Construction Field Manager.

- The condition identified at the site that triggered the corrective action.
- The nature of the condition identified.
- The date and time of the condition identified and how it was identified.

Within 7 calendar days of discovering the occurrence of one of the items identified above, a report from the Contractor will be generated and submitted to the ARCADIS Construction Field Manager. The Contractor report will include the following items:

- Follow-up actions completed to review the design, installation, and maintenance of stormwater controls, including the dates such actions occurred.
- A summary of stormwater control modifications completed or to be completed, including a schedule of activities necessary to implement changes, and the date the modifications are completed or expected to be completed.
- Notice of whether SWPPP modifications are required as a result of the condition identified or corrective action.

9 RECORDKEEPING

Copies of completed inspection reports, corrective action compliance reports, SWPPP amendment logs, and other pertinent SWPPP documentation will be retained with this SWPPP for at least 3 years.

10 STAFF TRAINING

Prior to the commencement of earth-disturbing activities or potential pollutant-generating activities (whichever occurs first), ARCADIS will ensure that the following personnel understand the requirements

of this SWPPP, the substantive requirements of the CGP, and their specific responsibilities with respect to those requirements:

- Personnel responsible for the design, installation, maintenance, and/or repair of stormwater controls (including pollution prevention measures).
- Personnel responsible for storing chemicals.
- Personnel responsible for conducting Site inspections as required in Section 7 of this SWPPP.
- Personnel responsible for completing corrective actions as required in Section 8 of this SWPPP.

At a minimum, site personnel will be trained to understand the following if it is deemed to be related to the scope of their duties during construction activities. Formal training for subcontractors or other outside service providers is not required to be provided or documented; however, ARCADIS will ensure that such personnel understand requirements of this SWPPP or the CGP that may affect the subcontracted work. Relevant Contractor duties will incorporate the requirements of the SWPPP, as appropriate.

- The location of stormwater controls on the site required by this SWPPP, and how the controls are to be maintained.
- The proper procedures to follow with respect to the pollution prevention requirements of this SWPPP.
- When and how to conduct inspections, record applicable findings, and complete corrective actions.

11 SWPPP MODIFICATIONS

This SWPPP will be modified in response to the following conditions:

- Whenever new operators[1] become active in construction activities on the site, or changes to the construction plans, stormwater control measures, pollution prevention measures, or other activities at the site that are no longer accurately reflected in this SWPPP (this includes changes made in response to corrective actions triggered under Section 8 of this SWPPP).
- If site inspections or investigations by site personnel, or by local, state, or federal officials determine that SWPPP modifications are necessary for compliance with the substantive requirements of the CGP.
- Where a regulatory agency determines it is necessary to impose additional requirements on the site's discharge, the following must be included in the SWPPP:
    - A copy of correspondence describing such requirements.
    - A description of the stormwater control measures that will be used to meet such requirements.

[1] As defined by the CGP, "Operator" is any party associated with a construction project that meets either of the following two criteria:
1. The party has operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications; or
2. The party has day-to-day operational control of those activities at a project that are necessary to ensure compliance with the permit conditions (e.g., they are authorized to direct workers at a site to carry out activities required by the permit).

- To reflect revisions to applicable federal, state, or local requirements that affect the stormwater control measures implemented at the site.

Revisions to this SWPPP will be made within 7 calendar days following the occurrence of the conditions identified above. Records showing the dates of SWPPP modifications, the name of the person authorizing the change, and a brief summary of changes will be maintained on the SWPPP Amendment Log.

12 POST-CONSTRUCTION STORMWATER MANAGEMENT

Following excavation, the disturbed areas will be returned to a stable grade. Stormwater runoff is expected to not change following remedial activities since the impervious area of the site will not change. No additional permanent stormwater management structures are planned, other than site grading and re-vegetation.

13 REFERENCES

U.S. Department of Agricultures (UDSA), Natural Resource Conservation Service. Web Soil Service. Accessed July 8, 2015.

SECOR, 2000. Limited Environmental Site Assessment Report, Former Industrial Petroleum Distribution Bulk Terminal. Prepared for ARCO Products Co. March 20.

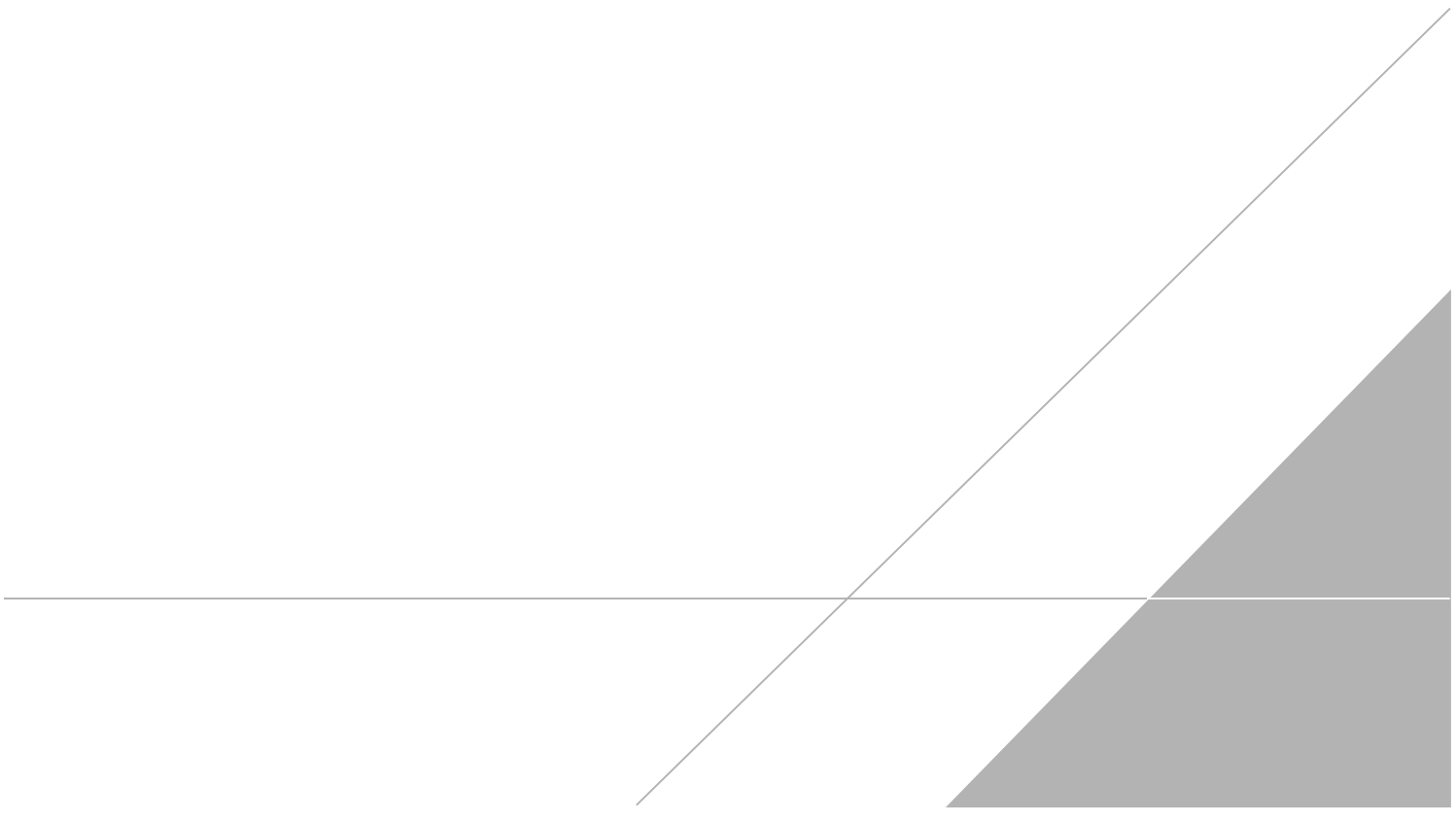
Washington State Department of Ecology (Ecology), 2014. Stormwater Management Manual for Western Washington. December.

Arcadis, 2015. Pre-Excavation Soil Sampling and Excavation Work Plan. Prepared for BP West Coast Product, LLC. June 2.

ATTACHMENT A

Construction General Permit

(PROVIDED FOR REFERENCE PURPOSES ONLY)



STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
PO Box 47600 • Olympia, WA 98504-7600 • 360-407-6000
711 for Washington Relay Service • Persons with a speech disability can call 877-833-6341

July 5, 2016

Myles Perkins
ARCADIS US Inc
1100 Olive Way Suite 800
Seattle, WA 98101

RE: Coverage under the Construction Stormwater General Permit

Permit number:	**WAR303363**
Site Name:	**Industrial Petroleum Distributors Site**
Location:	**1120 West Bay Drive**
	Olympia, WA **County: Thurston**
Disturbed Acres:	**0.2**

Dear Mr. Perkins:

The Washington State Department of Ecology (Ecology) received your Notice of Intent for coverage under Ecology's Construction Stormwater General Permit (permit). This is your permit coverage letter. Your permit coverage is effective on July 5, 2016. **Please retain this permit coverage letter with your permit (enclosed), stormwater pollution prevention plan (SWPPP), and site log book. These materials are the official record of permit coverage for your site.**

Please take time to read the entire permit and contact Ecology if you have any questions.

Appeal Process
You have a right to appeal coverage under the general permit to the Pollution Control Hearing Board (PCHB) within 30 days of the date of receipt of this letter. This appeal is limited to the general permit's applicability or non-applicability to a specific discharger. The appeal process is governed by chapter 43.21B RCW and chapter 371-08 WAC. "Date of receipt" is defined in RCW 43.21B.001(2).

To appeal, you must do the following within 30 days of the date of receipt of this letter:

- File your appeal and a copy of the permit cover page with the PCHB (see addresses below). Filing means actual receipt by the PCHB during regular business hours.
- Serve a copy of your appeal and the permit cover page on Ecology in paper form - by mail or in person (see addresses below). E-mail is not accepted.

You must also comply with other applicable requirements in chapter 43.21B RCW and chapter 371-08 WAC.

Address and Location Information:

Street Addresses:	**Mailing Addresses:**
Department of Ecology Attn: Appeals Processing Desk 300 Desmond Drive SE Lacey, WA 98503	Department of Ecology Attn: Appeals Processing Desk PO Box 47608 Olympia, WA 98504-7608
Pollution Control Hearings Board (PCHB) 1111 Israel Road SW, Suite 301 Tumwater, WA 98501	Pollution Control Hearings Board PO Box 40903 Olympia, WA 98504-0903

Electronic Discharge Monitoring Reports (WQWebDMR)
This permit requires that Permittees submit monthly discharge monitoring reports (DMRs) electronically using Ecology's secure online system, WQWebDMR. To sign up for WQWebDMR go to: www.ecy.wa.gov/programs/wq/permits/paris/webdmr.html. If you have questions, contact the portal staff at (360) 407-7097 (Olympia area), or (800) 633-6193/option 3, or email WQWebPortal@ecy.wa.gov.

Ecology Field Inspector Assistance
If you have questions regarding stormwater management at your construction site, please contact Carol Serdar of Ecology's Southwest Regional Office in Lacey at carol.serdar@ecy.wa.gov or (360) 407-6269.

Questions or Additional Information
Ecology is committed to providing assistance. Please review our web page at: www.ecy.wa.gov/programs/wq/stormwater/construction. If you have questions about the construction stormwater general permit, please contact Josh Klimek at josh.klimek@ecy.wa.gov or (360) 407-7451.

Sincerely,

Bill Moore, P.E., Manager
Program Development Services Section
Water Quality Program

Enclosure

Issuance Date: November 18, 2015
Effective Date: January 1, 2016
Expiration Date: December 31, 2020

CONSTRUCTION STORMWATER GENERAL PERMIT

National Pollutant Discharge Elimination System (NPDES) and State Waste Discharge General Permit for Stormwater Discharges Associated with Construction Activity

State of Washington
Department of Ecology
Olympia, Washington 98504

In compliance with the provisions of
Chapter 90.48 Revised Code of Washington
(State of Washington Water Pollution Control Act)
and
Title 33 United States Code, Section 1251 et seq.
The Federal Water Pollution Control Act (The Clean Water Act)

Until this permit expires, is modified, or revoked, Permittees that have properly obtained coverage under this general permit are authorized to discharge in accordance with the special and general conditions that follow.

Heather R. Bartlett
Water Quality Program Manager
Washington State Department of Ecology

TABLE OF CONTENTS

LIST OF TABLES

SUMMARY OF PERMIT REPORT SUBMITTALS

Refer to the Special and General Conditions within this permit for additional submittal requirements. Appendix A provides a list of definitions. Appendix B provides a list of acronyms.

Table 1: Summary of Required Submittals

Permit Section	Submittal	Frequency	First Submittal Date
S5.A and S8	High Turbidity/Transparency Phone Reporting	As Necessary	Within 24 hours
S5.B	Discharge Monitoring Report	Monthly*	Within 15 days following the end of each month
S5.F and S8	Noncompliance Notification – Telephone Notification	As necessary	Within 24-hours
S5.F	Noncompliance Notification – Written Report	As necessary	Within 5 Days of non-compliance
S9.C	Request for Chemical Treatment Form	As necessary	Written approval from Ecology is required prior to using chemical treatment (with the exception of dry ice or CO_2 to adjust pH)
G2	Notice of Change in Authorization	As necessary	
G6	Permit Application for Substantive Changes to the Discharge	As necessary	
G8	Application for Permit Renewal	1/permit cycle	No later than 180 days before expiration
G9	Notice of Permit Transfer	As necessary	
G20	Notice of Planned Changes	As necessary	
G22	Reporting Anticipated Non-compliance	As necessary	

SPECIAL NOTE: *Permittees must submit electronic Discharge Monitoring Reports (DMRs) to the Washington State Department of Ecology monthly, regardless of site discharge, for the full duration of permit coverage. Refer to Section S5.B of this General Permit for more specific information regarding DMRs.

Table 2: Summary of Required On-site Documentation

Document Title	Permit Conditions
Permit Coverage Letter	See Conditions S2, S5
Construction Stormwater General Permit	See Conditions S2, S5
Site Log Book	See Conditions S4, S5
Stormwater Pollution Prevention Plan (SWPPP)	See Conditions S9, S5

SPECIAL CONDITIONS

S1. PERMIT COVERAGE

A. Permit Area

This Construction Stormwater General Permit (CSWGP) covers all areas of Washington State, except for federal operators and Indian Country as specified in Special Condition S1.E.3.

B. Operators Required to Seek Coverage Under this General Permit:

1. Operators of the following construction activities are required to seek coverage under this CSWGP:

   a. Clearing, grading and/or excavation that results in the disturbance of one or more acres (including off-site disturbance acreage authorized in S1.C.2) and discharges stormwater to surface waters of the State; and clearing, grading and/or excavation on sites smaller than one acre that are part of a larger common plan of development or sale, if the common plan of development or sale will ultimately disturb one acre or more and discharge stormwater to surface waters of the State.

      i. This includes forest practices (including, but not limited to, class IV conversions) that are part of a construction activity that will result in the disturbance of one or more acres, and discharge to surface waters of the State (that is, forest practices that prepare a site for construction activities); and

   b. Any size construction activity discharging stormwater to waters of the State that the Washington State Department of Ecology (Ecology):

      i. Determines to be a significant contributor of pollutants to waters of the State of Washington.

      ii. Reasonably expects to cause a violation of any water quality standard.

2. Operators of the following activities are not required to seek coverage under this CSWGP (unless specifically required under Special Condition S1.B.1.b. above):

   a. Construction activities that discharge all stormwater and non-stormwater to ground water, sanitary sewer, or combined sewer, and have no point source discharge to either surface water or a storm sewer system that drains to surface waters of the State.

   b. Construction activities covered under an Erosivity Waiver (Special Condition S2.C).

   c. Routine maintenance that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of a facility.

C. Authorized Discharges:

1. *Stormwater Associated with Construction Activity.* Subject to compliance with the terms and conditions of this permit, Permittees are authorized to discharge stormwater associated with construction activity to surface waters of the State or to a storm sewer system that drains to surface waters of the State. (Note that "surface waters of the State" may exist on a construction site as well as off site; for example, a creek running through a site.)

2. *Stormwater Associated with Construction Support Activity*. This permit also authorizes stormwater discharge from support activities related to the permitted construction site (for example, an on-site portable rock crusher, off-site equipment staging yards, material storage areas, borrow areas, etc.) provided:

   a. The support activity relates directly to the permitted construction site that is required to have an NPDES permit; and

   b. The support activity is not a commercial operation serving multiple unrelated construction projects, and does not operate beyond the completion of the construction activity; and

   c. Appropriate controls and measures are identified in the Stormwater Pollution Prevention Plan (SWPPP) for the discharges from the support activity areas.

3. *Non-Stormwater Discharges*. The categories and sources of non-stormwater discharges identified below are authorized conditionally, provided the discharge is consistent with the terms and conditions of this permit:

   a. Discharges from fire-fighting activities.

   b. Fire hydrant system flushing.

   c. Potable water, including uncontaminated water line flushing.

   d. Hydrostatic test water.

   e. Uncontaminated air conditioning or compressor condensate.

   f. Uncontaminated ground water or spring water.

   g. Uncontaminated excavation dewatering water (in accordance with S9.D.10).

   h. Uncontaminated discharges from foundation or footing drains.

   i. Uncontaminated water used to control dust. Permittees must minimize the amount of dust control water used.

   j. Routine external building wash down that does not use detergents.

   k. Landscape irrigation water.

The SWPPP must adequately address all authorized non-stormwater discharges, except for discharges from fire-fighting activities, and must comply with Special Condition S3.

At a minimum, discharges from potable water (including water line flushing), fire hydrant system flushing, and pipeline hydrostatic test water must undergo the following: dechlorination to a concentration of 0.1 parts per million (ppm) or less, and pH adjustment to within 6.5 – 8.5 standard units (su), if necessary.

D. Prohibited Discharges:

The following discharges to waters of the State, including ground water, are prohibited.

1. Concrete wastewater.
2. Wastewater from washout and clean-up of stucco, paint, form release oils, curing compounds and other construction materials.
3. Process wastewater as defined by 40 Code of Federal Regulations (CFR) 122.2 (see Appendix A of this permit).
4. Slurry materials and waste from shaft drilling, including process wastewater from shaft drilling for construction of building, road, and bridge foundations unless managed according to Special Condition S9.D.9.j.
5. Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance.
6. Soaps or solvents used in vehicle and equipment washing.
7. Wheel wash wastewater, unless managed according to Special Condition S9.D.9.
8. Discharges from dewatering activities, including discharges from dewatering of trenches and excavations, unless managed according to Special Condition S9.D.10.

E. Limits on Coverage

Ecology may require any discharger to apply for and obtain coverage under an individual permit or another more specific general permit. Such alternative coverage will be required when Ecology determines that this CSWGP does not provide adequate assurance that water quality will be protected, or there is a reasonable potential for the project to cause or contribute to a violation of water quality standards.

The following stormwater discharges are not covered by this permit:

1. Post-construction stormwater discharges that originate from the site after completion of construction activities and the site has undergone final stabilization.
2. Non-point source silvicultural activities such as nursery operations, site preparation, reforestation and subsequent cultural treatment, thinning, prescribed burning, pest and fire control, harvesting operations, surface drainage, or road construction and maintenance, from which there is natural runoff as excluded in 40 CFR Subpart 122.
3. Stormwater from any federal operator.

4. Stormwater from facilities located on "Indian Country" as defined in 18 U.S.C.§1151, except portions of the Puyallup Reservation as noted below.

   Indian Country includes:

   a. All land within any Indian Reservation notwithstanding the issuance of any patent, and, including rights-of-way running through the reservation. This includes all federal, tribal, and Indian and non-Indian privately owned land within the reservation.

   b. All off-reservation Indian allotments, the Indian titles to which have not been extinguished, including rights-of-way running through the same.

   c. All off-reservation federal trust lands held for Native American Tribes.

      Puyallup Exception: Following the *Puyallup Tribes of Indians Land Settlement Act of 1989*, 25 U.S.C. §1773; the permit does apply to land within the Puyallup Reservation except for discharges to surface water on land held in trust by the federal government.

5. Stormwater from any site covered under an existing NPDES individual permit in which stormwater management and/or treatment requirements are included for all stormwater discharges associated with construction activity.

6. Stormwater from a site where an applicable Total Maximum Daily Load (TMDL) requirement specifically precludes or prohibits discharges from construction activity.

S2. APPLICATION REQUIREMENTS

A. Permit Application Forms

1. Notice of Intent Form/Timeline

   a. Operators of new or previously unpermitted construction activities must submit a complete and accurate permit application (Notice of Intent, or NOI) to Ecology.

   b. Operators must apply using the electronic application form (NOI) available on Ecology's website http://www.ecy.wa.gov/programs/wq/stormwater/construction/index.html. Permittees unable to submit electronically (for example, those who do not have an internet connection) must contact Ecology to request a waiver and obtain instructions on how to obtain a paper NOI.

      Department of Ecology
      Water Quality Program - Construction Stormwater
      PO Box 47696
      Olympia, Washington 98504-7696

c. The operator must submit the NOI at least 60 days before discharging stormwater from construction activities and must submit it on or before the date of the first public notice (see Special Condition S2.B below for details). The 30-day public comment period begins on the publication date of the second public notice. Unless Ecology responds to the complete application in writing, based on public comments, or any other relevant factors, coverage under the general permit will automatically commence on the thirty-first day following receipt by Ecology of a completed NOI, or the issuance date of this permit, whichever is later; unless Ecology specifies a later date in writing as required by WAC173-226-200(2).

d. If an applicant intends to use a Best Management Practice (BMP) selected on the basis of Special Condition S9.C.4 ("demonstrably equivalent" BMPs), the applicant must notify Ecology of its selection as part of the NOI. In the event the applicant selects BMPs after submission of the NOI, it must provide notice of the selection of an equivalent BMP to Ecology at least 60 days before intended use of the equivalent BMP.

e. Permittees must notify Ecology regarding any changes to the information provided on the NOI by submitting an updated NOI. Examples of such changes include, but are not limited to:

    i. Changes to the Permittee's mailing address,

    ii. Changes to the on-site contact person information, ***and***

    iii. Changes to the area/acreage affected by construction activity.

f. Applicants must notify Ecology if they are aware of contaminated soils and/or groundwater associated with the construction activity. Provide detailed information with the NOI (as known and readily available) on the nature and extent of the contamination (concentrations, locations, and depth), as well as pollution prevention and/or treatment BMPs proposed to control the discharge of soil and/or groundwater contaminants in stormwater. Examples of such detail may include, but are not limited to:

    i. List or table of all known contaminants with laboratory test results showing concentration and depth,

    ii. Map with sample locations,

    iii. Temporary Erosion and Sediment Control (TESC) plans,

    iv. Related portions of the Stormwater Pollution Prevention Plan (SWPPP) that address the management of contaminated and potentially contaminated construction stormwater and dewatering water,

    v. Dewatering plan and/or dewatering contingency plan.

2. Transfer of Coverage Form

   The Permittee can transfer current coverage under this permit to one or more new operators, including operators of sites within a Common Plan of Development, provided the Permittee submits a Transfer of Coverage Form in accordance with General Condition G9. Transfers do not require public notice.

B. Public Notice

For new or previously unpermitted construction activities, the applicant must publish a public notice at least one time each week for two consecutive weeks, at least 7 days apart, in a newspaper with general circulation in the county where the construction is to take place. The notice must contain:

1. A statement that "The applicant is seeking coverage under the Washington State Department of Ecology's Construction Stormwater NPDES and State Waste Discharge General Permit".

2. The name, address and location of the construction site.

3. The name and address of the applicant.

4. The type of construction activity that will result in a discharge (for example, residential construction, commercial construction, etc.), and the number of acres to be disturbed.

5. The name of the receiving water(s) (that is, the surface water(s) to which the site will discharge), or, if the discharge is through a storm sewer system, the name of the operator of the system.

6. The statement: "Any persons desiring to present their views to the Washington State Department of Ecology regarding this application, or interested in Ecology's action on this application, may notify Ecology in writing no later than 30 days of the last date of publication of this notice. Ecology reviews public comments and considers whether discharges from this project would cause a measurable change in receiving water quality, and, if so, whether the project is necessary and in the overriding public interest according to Tier II antidegradation requirements under WAC 173-201A-320. Comments can be submitted to: Department of Ecology, PO Box 47696, Olympia, Washington 98504-7696 Attn: Water Quality Program, Construction Stormwater."

C. Erosivity Waiver

Construction site operators may qualify for an erosivity waiver from the CSWGP if the following conditions are met:

1. The site will result in the disturbance of fewer than 5 acres and the site is not a portion of a common plan of development or sale that will disturb 5 acres or greater.

2. Calculation of Erosivity "R" Factor and Regional Timeframe:

   a. The project's rainfall erosivity factor ("R" Factor) must be less than 5 during the period of construction activity, as calculated (see the CSWGP homepage http://www.ecy.wa.gov/programs/wq/stormwater/construction/index.html for a link to the EPA's calculator and step by step instructions on computing the "R" Factor in the EPA Erosivity Waiver Fact Sheet). The period of construction activity starts when the land is first disturbed and ends with final stabilization. In addition:

   b. The entire period of construction activity must fall within the following timeframes:

      i. For sites west of the Cascades Crest: June 15 – September 15.

      ii. For sites east of the Cascades Crest, excluding the Central Basin: June 15 – October 15.

      iii. For sites east of the Cascades Crest, within the Central Basin: no additional timeframe restrictions apply. The Central Basin is defined as the portions of Eastern Washington with mean annual precipitation of less than 12 inches. For a map of the Central Basin (Average Annual Precipitation Region 2), refer to http://www.ecy.wa.gov/programs/wq/stormwater/construction/resourcesguidance.html.

3. Construction site operators must submit a complete Erosivity Waiver certification form at least one week before disturbing the land. Certification must include statements that the operator will:

   a. Comply with applicable local stormwater requirements; ***and***

   b. Implement appropriate erosion and sediment control BMPs to prevent violations of water quality standards.

4. This waiver is not available for facilities declared significant contributors of pollutants as defined in Special Condition S1.B.1.b. or for any size construction activity that could reasonably expect to cause a violation of any water quality standard as defined in Special Condition S1.B.1.b.ii.

5. This waiver does not apply to construction activities which include non-stormwater discharges listed in Special Condition S1.C.3.

6. If construction activity extends beyond the certified waiver period for any reason, the operator must either:

    a. Recalculate the rainfall erosivity "R" factor using the original start date and a new projected ending date and, if the "R" factor is still under 5 *and* the entire project falls within the applicable regional timeframe in Special Condition S2.C.2.b, complete and submit an amended waiver certification form before the original waiver expires; ***or***

    b. Submit a complete permit application to Ecology in accordance with Special Condition S2.A and B before the end of the certified waiver period.

S3. COMPLIANCE WITH STANDARDS

A. Discharges must not cause or contribute to a violation of surface water quality standards (Chapter 173-201A WAC), ground water quality standards (Chapter 173-200 WAC), sediment management standards (Chapter 173-204 WAC), and human health-based criteria in the National Toxics Rule (40 CFR Part 131.36). Discharges not in compliance with these standards are not authorized.

B. Prior to the discharge of stormwater and non-stormwater to waters of the State, the Permittee must apply all known, available, and reasonable methods of prevention, control, and treatment (AKART). This includes the preparation and implementation of an adequate SWPPP, with all appropriate BMPs installed and maintained in accordance with the SWPPP and the terms and conditions of this permit.

C. Ecology presumes that a Permittee complies with water quality standards unless discharge monitoring data or other site-specific information demonstrates that a discharge causes or contributes to a violation of water quality standards, when the Permittee complies with the following conditions. The Permittee must fully:

    1. Comply with all permit conditions, including planning, sampling, monitoring, reporting, and recordkeeping conditions.

    2. Implement stormwater BMPs contained in stormwater management manuals published or approved by Ecology, or BMPs that are demonstrably equivalent to BMPs contained in stormwater technical manuals published or approved by Ecology, including the proper selection, implementation, and maintenance of all applicable and appropriate BMPs for on-site pollution control. (For purposes of this section, the stormwater manuals listed in Appendix 10 of the Phase I Municipal Stormwater Permit are approved by Ecology.)

D. Where construction sites also discharge to ground water, the ground water discharges must also meet the terms and conditions of this CSWGP. Permittees who discharge to ground water through an injection well must also comply with any applicable requirements of the Underground Injection Control (UIC) regulations, Chapter 173-218 WAC.

S4. MONITORING REQUIREMENTS, BENCHMARKS, AND REPORTING TRIGGERS

A. Site Log Book

The Permittee must maintain a site log book that contains a record of the implementation of the SWPPP and other permit requirements, including the installation and maintenance of BMPs, site inspections, and stormwater monitoring.

B. Site Inspections

The Permittee's site inspections must include all areas disturbed by construction activities, all BMPs, and all stormwater discharge points under the Permittee's operational control. (See Special Conditions S4.B.3 and B.4 below for detailed requirements of the Permittee's Certified Erosion and Sediment Control Lead [CESCL].)

Construction sites one acre or larger that discharge stormwater to surface waters of the State must have site inspections conducted by a certified CESCL. Sites less than one acre may have a person without CESCL certification conduct inspections.

1. The Permittee must examine stormwater visually for the presence of suspended sediment, turbidity, discoloration, and oil sheen. The Permittee must evaluate the effectiveness of BMPs and determine if it is necessary to install, maintain, or repair BMPs to improve the quality of stormwater discharges.

   Based on the results of the inspection, the Permittee must correct the problems identified by:

   a. Reviewing the SWPPP for compliance with Special Condition S9 and making appropriate revisions within 7 days of the inspection.

   b. Immediately beginning the process of fully implementing and maintaining appropriate source control and/or treatment BMPs as soon as possible, addressing the problems no later than within 10 days of the inspection. If installation of necessary treatment BMPs is not feasible within 10 days, Ecology may approve additional time when an extension is requested by a Permittee within the initial 10-day response period.

   c. Documenting BMP implementation and maintenance in the site log book.

2. The Permittee must inspect all areas disturbed by construction activities, all BMPs, and all stormwater discharge points at least once every calendar week and within 24 hours of any discharge from the site. (For purposes of this condition, individual discharge events that last more than one day do not require daily inspections. For example, if a stormwater pond discharges continuously over the course of a week, only one inspection is required that week.) The Permittee may reduce the inspection frequency for temporarily stabilized, inactive sites to once every calendar month.

3. The Permittee must have staff knowledgeable in the principles and practices of erosion and sediment control. The CESCL (sites one acre or more) or inspector (sites less than one acre) must have the skills to assess the:

    a. Site conditions and construction activities that could impact the quality of stormwater, ***and***

    b. Effectiveness of erosion and sediment control measures used to control the quality of stormwater discharges.

4. The SWPPP must identify the CESCL or inspector, who must be present on site or on-call at all times. The CESCL must obtain this certification through an approved erosion and sediment control training program that meets the minimum training standards established by Ecology (see BMP C160 in the manual referred to in Special Condition S9.C.1 and 2).

5. The Permittee must summarize the results of each inspection in an inspection report or checklist and enter the report/checklist into, or attach it to, the site log book. At a minimum, each inspection report or checklist must include:

    a. Inspection date and time.

    b. Weather information, the general conditions during inspection and the approximate amount of precipitation since the last inspection, and precipitation within the last 24 hours.

    c. A summary or list of all implemented BMPs, including observations of all erosion/sediment control structures or practices.

    d. A description of the locations:

        i. Of BMPs inspected;

        ii. Of BMPs that need maintenance and why;

        iii. Of BMPs that failed to operate as designed or intended; ***and***

        iv. Where additional or different BMPs are needed, and why.

    e. A description of stormwater discharged from the site. The Permittee must note the presence of suspended sediment, turbidity, discoloration, and oil sheen, as applicable.

    f. Any water quality monitoring performed during inspection.

    g. General comments and notes, including a brief description of any BMP repairs, maintenance or installations made following the inspection.

    h. A summary report and a schedule of implementation of the remedial actions that the Permittee plans to take if the site inspection indicates that the site is out of compliance. The remedial actions taken must meet the requirements of the SWPPP and the permit.

i. The name, title, and signature of the person conducting the site inspection, a phone number or other reliable method to reach this person, and the following statement: "I certify that this report is true, accurate, and complete to the best of my knowledge and belief."

Table 3: Summary of Primary Monitoring Requirements

Size of Soil Disturbance[1]	Weekly Site Inspections	Weekly Sampling w/ Turbidity Meter	Weekly Sampling w/ Transparency Tube	Weekly pH Sampling[2]	CESCL Required for Inspections?
Sites that disturb less than 1 acre, but are part of a larger Common Plan of Development	Required	Not Required	Not Required	Not Required	No
Sites that disturb 1 acre or more, but fewer than 5 acres	Required	Sampling Required – either method[3]		Required	Yes
Sites that disturb 5 acres or more	Required	Required	Not Required[4]	Required	Yes

[1] Soil disturbance is calculated by adding together all areas that will be affected by construction activity. Construction activity means clearing, grading, excavation, and any other activity that disturbs the surface of the land, including ingress/egress from the site.

[2] If construction activity results in the disturbance of 1 acre or more, and involves significant concrete work (1,000 cubic yards of poured over the life of a project) or the use of recycled concrete or engineered soils (soil amendments including but not limited to Portland cement-treated base [CTB], cement kiln dust [CKD], or fly ash), and stormwater from the affected area drains to surface waters of the State or to a storm sewer stormwater collection system that drains to other surface waters of the State, the Permittee must conduct pH sampling in accordance with Special Condition S4.D.

[3] Sites with one or more acres, but fewer than 5 acres of soil disturbance, must conduct turbidity or transparency sampling in accordance with Special Condition S4.C.

[4] Sites equal to or greater than 5 acres of soil disturbance must conduct turbidity sampling using a turbidity meter in accordance with Special Condition S4.C.

C. Turbidity/Transparency Sampling Requirements

1. Sampling Methods

   a. If construction activity involves the disturbance of 5 acres or more, the Permittee must conduct turbidity sampling per Special Condition S4.C.

   b. If construction activity involves 1 acre or more but fewer than 5 acres of soil disturbance, the Permittee must conduct either transparency sampling **or** turbidity sampling per Special Condition S4.C.

2. Sampling Frequency

   a. The Permittee must sample all discharge points at least once every calendar week when stormwater (or authorized non-stormwater) discharges from the site or enters any on-site surface waters of the state (for example, a creek running through a site); sampling is not required on sites that disturb less than an acre.

   b. Samples must be representative of the flow and characteristics of the discharge.

   c. Sampling is not required when there is no discharge during a calendar week.

   d. Sampling is not required outside of normal working hours or during unsafe conditions.

   e. If the Permittee is unable to sample during a monitoring period, the Permittee must include a brief explanation in the monthly Discharge Monitoring Report (DMR).

   f. Sampling is not required before construction activity begins.

   g. The Permittee may reduce the sampling frequency for temporarily stabilized, inactive sites to once every calendar month.

3. Sampling Locations

   a. Sampling is required at all points where stormwater associated with construction activity (or authorized non-stormwater) is discharged off site, including where it enters any on-site surface waters of the state (for example, a creek running through a site).

   b. The Permittee may discontinue sampling at discharge points that drain areas of the project that are fully stabilized to prevent erosion.

   c. The Permittee must identify all sampling point(s) on the SWPPP site map and clearly mark these points in the field with a flag, tape, stake or other visible marker.

   d. Sampling is not required for discharge that is sent directly to sanitary or combined sewer systems.

e. The Permittee may discontinue sampling at discharge points in areas of the project where the Permittee no longer has operational control of the construction activity.

4. Sampling and Analysis Methods

a. The Permittee performs turbidity analysis with a calibrated turbidity meter (turbidimeter) either on site or at an accredited lab. The Permittee must record the results in the site log book in nephelometric turbidity units (NTUs).

b. The Permittee performs transparency analysis on site with a 1¾-inch-diameter, 60-centimeter (cm)-long transparency tube. The Permittee will record the results in the site log book in centimeters (cm).

Table 4: Monitoring and Reporting Requirements

Parameter	Unit	Analytical Method	Sampling Frequency	Benchmark Value	Phone Reporting Trigger Value
Turbidity	NTU	SM2130	Weekly, if discharging	25 NTUs	250 NTUs
Transparency	cm	Manufacturer instructions, or Ecology guidance	Weekly, if discharging	33 cm	6 cm

5. Turbidity/Transparency Benchmark Values and Reporting Triggers

The benchmark value for turbidity is 25 NTUs or less. The benchmark value for transparency is 33 centimeters (cm). Note: Benchmark values do not apply to discharges to segments of water bodies on Washington State's 303(d) list (Category 5) for turbidity, fine sediment, or phosphorus; these discharges are subject to a numeric effluent limit for turbidity. Refer to Special Condition S8 for more information.

a. Turbidity 26 – 249 NTUs, or Transparency 32 – 7 cm:

If the discharge turbidity is 26 to 249 NTUs; or if discharge transparency is less than 33 cm, but equal to or greater than 6 cm, the Permittee must:

i. Review the SWPPP for compliance with Special Condition S9 and make appropriate revisions within 7 days of the date the discharge exceeded the benchmark.

ii. Immediately begin the process to fully implement and maintain appropriate source control and/or treatment BMPs as soon as possible, addressing the problems within 10 days of the date the discharge exceeded the benchmark. If installation of necessary treatment BMPs is not feasible within 10 days, Ecology may approve additional time when the Permittee requests an extension within the initial 10-day response period.

iii. Document BMP implementation and maintenance in the site log book.

b. Turbidity 250 NTUs or greater, or Transparency 6 cm or less:

If a discharge point's turbidity is 250 NTUs or greater, or if discharge transparency is less than or equal to 6 cm, the Permittee must complete the reporting and adaptive management process described below.

i. Telephone or submit an electronic report to the applicable Ecology Region's Environmental Report Tracking System (ERTS) number (or through Ecology's Water Quality Permitting Portal [WQWebPortal] – Permit Submittals when the form is available) within 24 hours, in accordance with Special Condition S5.A.

- Central Region (Okanogan, Chelan, Douglas, Kittitas, Yakima, Klickitat, Benton): (509) 575-2490
- Eastern Region (Adams, Asotin, Columbia, Ferry, Franklin, Garfield, Grant, Lincoln, Pend Oreille, Spokane, Stevens, Walla Walla, Whitman): (509) 329-3400
- Northwest Region (Kitsap, Snohomish, Island, King, San Juan, Skagit, Whatcom): (425) 649-7000
- Southwest Region (Grays Harbor, Lewis, Mason, Thurston, Pierce, Clark, Cowlitz, Skamania, Wahkiakum, Clallam, Jefferson, Pacific): (360) 407-6300

Links to these numbers and the ERTS reporting page are located on the following web site: http://www.ecy.wa.gov/programs/wq/stormwater/construction/index.html.

ii. Review the SWPPP for compliance with Special Condition S9 and make appropriate revisions within 7 days of the date the discharge exceeded the benchmark.

iii. Immediately begin the process to fully implement and maintain appropriate source control and/or treatment BMPs as soon as possible, addressing the problems within 10 days of the date the discharge exceeded the benchmark. If installation of necessary treatment BMPs is not feasible within 10 days, Ecology may approve additional time when the Permittee requests an extension within the initial 10-day response period.

iv. Document BMP implementation and maintenance in the site log book.

v. Sample discharges daily until:

a) Turbidity is 25 NTUs (or lower); ***or***

b) Transparency is 33 cm (or greater); ***or***

c) The Permittee has demonstrated compliance with the water quality limit for turbidity:

1) No more than 5 NTUs over background turbidity, if background is less than 50 NTUs, ***or***

2) No more than 10% over background turbidity, if background is 50 NTUs or greater; ***or***

d) The discharge stops or is eliminated.

D. pH Sampling Requirements – Significant Concrete Work or Engineered Soils

If construction activity results in the disturbance of 1 acre or more, ***and*** involves significant concrete work (significant concrete work means greater than 1000 cubic yards poured concrete used over the life of a project) or the use of recycled concrete or engineered soils (soil amendments including but not limited to Portland cement-treated base [CTB], cement kiln dust [CKD], or fly ash), and stormwater from the affected area drains to surface waters of the State or to a storm sewer system that drains to surface waters of the State, the Permittee must conduct pH sampling as set forth below. Note: In addition, discharges to segments of water bodies on Washington State's 303(d) list (Category 5) for high pH are subject to a numeric effluent limit for pH; refer to Special Condition S8.

1. For sites with significant concrete work, the Permittee must begin the pH sampling period when the concrete is first poured and exposed to precipitation, and continue weekly throughout and after the concrete pour and curing period, until stormwater pH is in the range of 6.5 to 8.5 (su).

2. For sites with recycled concrete, the Permittee must begin the weekly pH sampling period when the recycled concrete is first exposed to precipitation and must continue until the recycled concrete is fully stabilized and stormwater pH is in the range of 6.5 to 8.5 (su).

3. For sites with engineered soils, the Permittee must begin the pH sampling period when the soil amendments are first exposed to precipitation and must continue until the area of engineered soils is fully stabilized.

4. During the applicable pH monitoring period defined above, the Permittee must obtain a representative sample of stormwater and conduct pH analysis at least once per week.

5. The Permittee must sample pH in the sediment trap/pond(s) or other locations that receive stormwater runoff from the area of significant concrete work or engineered soils before the stormwater discharges to surface waters.

6. The benchmark value for pH is 8.5 standard units. Anytime sampling indicates that pH is 8.5 or greater, the Permittee must either:

a. Prevent the high pH water (8.5 or above) from entering storm sewer systems or surface waters; ***or***

b. If necessary, adjust or neutralize the high pH water until it is in the range of pH 6.5 to 8.5 (su) using an appropriate treatment BMP such as carbon dioxide (CO_2) sparging or dry ice. The Permittee must obtain written approval from Ecology before using any form of chemical treatment other than CO_2 sparging or dry ice.

7. The Permittee must perform pH analysis on site with a calibrated pH meter, pH test kit, or wide range pH indicator paper. The Permittee must record pH sampling results in the site log book.

S5. REPORTING AND RECORDKEEPING REQUIREMENTS

A. High Turbidity Reporting

Anytime sampling performed in accordance with Special Condition S4.C indicates turbidity has reached the 250 NTUs or more (or transparency less than or equal to 6 cm) high turbidity reporting level, the Permittee must either call the applicable Ecology Region's Environmental Report Tracking System (ERTS) number by phone within 24 hours of analysis or submit an electronic ERTS report (or submit an electronic report through Ecology's Water Quality Permitting Portal (WQWebPortal) – Permit Submittals when the form is available). See the CSWGP web site for links to ERTS and the WQWebPortal: http://www.ecy.wa.gov/programs/wq/stormwater/construction/index.html. Also, see phone numbers in Special Condition S4.C.5.b.i.

B. Discharge Monitoring Reports (DMRs)

Permittees required to conduct water quality sampling in accordance with Special Conditions S4.C (Turbidity/Transparency), S4.D (pH), S8 (303[d]/TMDL sampling), and/or G13 (Additional Sampling) must submit the results to Ecology.

Permittees must submit monitoring data using Ecology's WQWebDMR web application accessed through Ecology's Water Quality Permitting Portal. To find out more information and to sign up for WQWebDMR go to: http://www.ecy.wa.gov/programs/wq/permits/paris/portal.html.

Permittees unable to submit electronically (for example, those who do not have an internet connection) must contact Ecology to request a waiver and obtain instructions on how to obtain a paper copy DMR at:

Department of Ecology
Water Quality Program - Construction Stormwater
PO Box 47696
Olympia, Washington 98504-7696

Permittees who obtain a waiver not to use WQWebDMR must use the forms provided to them by Ecology; submittals must be mailed to the address above. Permittees shall

submit DMR forms to be received by Ecology within 15 days following the end of each month.

If there was no discharge during a given monitoring period, all Permittees must submit a DMR as required with "no discharge" entered in place of the monitoring results. DMRs are required for the full duration of permit coverage (from issuance date to termination). For more information, contact Ecology staff using information provided at the following web site: www.ecy.wa.gov/programs/wq/permits/paris/contacts.html.

C. Records Retention

The Permittee must retain records of all monitoring information (site log book, sampling results, inspection reports/checklists, etc.), Stormwater Pollution Prevention Plan, copy of the permit coverage letter (including Transfer of Coverage documentation), and any other documentation of compliance with permit requirements for the entire life of the construction project and for a minimum of three years following the termination of permit coverage. Such information must include all calibration and maintenance records, and records of all data used to complete the application for this permit. This period of retention must be extended during the course of any unresolved litigation regarding the discharge of pollutants by the Permittee or when requested by Ecology.

D. Recording Results

For each measurement or sample taken, the Permittee must record the following information:

1. Date, place, method, and time of sampling or measurement.
2. The first and last name of the individual who performed the sampling or measurement.
3. The date(s) the analyses were performed.
4. The first and last name of the individual who performed the analyses.
5. The analytical techniques or methods used.
6. The results of all analyses.

E. Additional Monitoring by the Permittee

If the Permittee monitors any pollutant more frequently than required by this permit using test procedures specified by Special Condition S4 of this permit, the results of this monitoring must be included in the calculation and reporting of the data submitted in the Permittee's DMR.

F. Noncompliance Notification

In the event the Permittee is unable to comply with any part of the terms and conditions of this permit, and the resulting noncompliance may cause a threat to human health or the environment (such as but not limited to spills of fuels or other materials, catastrophic pond or slope failure, and discharges that violate water quality standards), or exceed

numeric effluent limitations (see S8. Discharges to 303(d) or TMDL Waterbodies), the Permittee must, upon becoming aware of the circumstance:

1. Notify Ecology within 24-hours of the failure to comply by calling the applicable Regional office ERTS phone number (refer to Special Condition S4.C.5.b.i. or www.ecy.wa.gov/programs/wq/stormwater/construction/turbidity.html for Regional ERTS phone numbers).

2. Immediately take action to prevent the discharge/pollution, or otherwise stop or correct the noncompliance, and, if applicable, repeat sampling and analysis of any noncompliance immediately and submit the results to Ecology within five (5) days of becoming aware of the violation.

3. Submit a detailed written report to Ecology within five (5) days, of the time the Permittee becomes aware of the circumstances, unless requested earlier by Ecology. The report must be submitted using Ecology's Water Quality Permitting Portal (WQWebPortal) - Permit Submittals, unless a waiver from electronic reporting has been granted according to S5.B. The report must contain a description of the noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and the steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

   The Permittee must report any unanticipated bypass and/or upset that exceeds any effluent limit in the permit in accordance with the 24-hour reporting requirement contained in 40 C.F.R. 122.41(l)(6).

   Compliance with these requirements does not relieve the Permittee from responsibility to maintain continuous compliance with the terms and conditions of this permit or the resulting liability for failure to comply. Upon request of the Permittee, Ecology may waive the requirement for a written report on a case-by-case basis, if the immediate notification is received by Ecology within 24 hours.

G. Access to Plans and Records

1. The Permittee must retain the following permit documentation (plans and records) on site, or within reasonable access to the site, for use by the operator or for on-site review by Ecology or the local jurisdiction:

   a. General Permit

   b. Permit Coverage Letter

   c. Stormwater Pollution Prevention Plan (SWPPP)

   d. Site Log Book

2. The Permittee must address written requests for plans and records listed above (Special Condition S5.G.1) as follows:

a. The Permittee must provide a copy of plans and records to Ecology within 14 days of receipt of a written request from Ecology.

b. The Permittee must provide a copy of plans and records to the public when requested in writing. Upon receiving a written request from the public for the Permittee's plans and records, the Permittee must either:

   i. Provide a copy of the plans and records to the requester within 14 days of a receipt of the written request; ***or***

   ii. Notify the requester within 10 days of receipt of the written request of the location and times within normal business hours when the plans and records may be viewed; and provide access to the plans and records within 14 days of receipt of the written request; ***or***

   iii. Within 14 days of receipt of the written request, the Permittee may submit a copy of the plans and records to Ecology for viewing and/or copying by the requester at an Ecology office, or a mutually agreed location. If plans and records are viewed and/or copied at a location other than at an Ecology office, the Permittee will provide reasonable access to copying services for which a reasonable fee may be charged. The Permittee must notify the requester within 10 days of receipt of the request where the plans and records may be viewed and/or copied.

S6. PERMIT FEES

The Permittee must pay permit fees assessed by Ecology. Fees for stormwater discharges covered under this permit are established by Chapter 173-224 WAC. Ecology continues to assess permit fees until the permit is terminated in accordance with Special Condition S10 or revoked in accordance with General Condition G5.

S7. SOLID AND LIQUID WASTE DISPOSAL

The Permittee must handle and dispose of solid and liquid wastes generated by construction activity, such as demolition debris, construction materials, contaminated materials, and waste materials from maintenance activities, including liquids and solids from cleaning catch basins and other stormwater facilities, in accordance with:

A. Special Condition S3, Compliance with Standards

B. WAC 173-216-110

C. Other applicable regulations

S8. DISCHARGES TO 303(d) OR TMDL WATERBODIES

A. Sampling and Numeric Effluent Limits For Certain Discharges to 303(d)-listed Waterbodies

1. Permittees who discharge to segments of waterbodies listed as impaired by the State of Washington under Section 303(d) of the Clean Water Act for turbidity, fine sediment, high pH, or phosphorus, must conduct water quality sampling according to the requirements of this section, and Special Conditions S4.C.2.b-f and S4.C.3.b-d, and must comply with the applicable numeric effluent limitations in S8.C and S8.D.

2. All references and requirements associated with Section 303(d) of the Clean Water Act mean the most current listing by Ecology of impaired waters (Category 5) that exists on January 1, 2016, or the date when the operator's complete permit application is received by Ecology, whichever is later.

B. Limits on Coverage for New Discharges to TMDL or 303(d)-listed Waters

Operators of construction sites that discharge to a TMDL or 303(d)-listed waterbody are not eligible for coverage under this permit *unless* the operator:

1. Prevents exposing stormwater to pollutants for which the waterbody is impaired, and retains documentation in the SWPPP that details procedures taken to prevent exposure on site; ***or***

2. Documents that the pollutants for which the waterbody is impaired are not present at the site, and retains documentation of this finding within the SWPPP; ***or***

3. Provides Ecology with data indicating the discharge is not expected to cause or contribute to an exceedance of a water quality standard, and retains such data on site with the SWPPP. The operator must provide data and other technical information to Ecology that sufficiently demonstrate:

   a. For discharges to waters without an EPA-approved or -established TMDL, that the discharge of the pollutant for which the water is impaired will meet in-stream water quality criteria at the point of discharge to the waterbody; ***or***

   b. For discharges to waters with an EPA-approved or -established TMDL, that there is sufficient remaining wasteload allocation in the TMDL to allow construction stormwater discharge and that existing dischargers to the waterbody are subject to compliance schedules designed to bring the waterbody into attainment with water quality standards.

   Operators of construction sites are eligible for coverage under this permit if Ecology issues permit coverage based upon an affirmative determination that the *discharge will not cause or contribute to the existing impairment.*

C. Sampling and Numeric Effluent Limits for Discharges to Water Bodies on the 303(d) List for Turbidity, Fine Sediment, or Phosphorus

1. Permittees who discharge to segments of water bodies on the 303(d) list (Category 5) for turbidity, fine sediment, or phosphorus must conduct turbidity sampling in accordance with Special Condition S4.C.2 and comply with either of the numeric effluent limits noted in Table 5 below.

2. As an alternative to the 25 NTUs effluent limit noted in Table 5 below (applied at the point where stormwater [or authorized non-stormwater] is discharged off-site), Permittees may choose to comply with the surface water quality standard for turbidity. The standard is: no more than 5 NTUs over background turbidity when the background turbidity is 50 NTUs or less, or no more than a 10% increase in turbidity when the background turbidity is more than 50 NTUs. In order to use the water quality standard requirement, the sampling must take place at the following locations:

   a. Background turbidity in the 303(d)-listed receiving water immediately upstream (upgradient) or outside the area of influence of the discharge.

   b. Turbidity at the point of discharge into the 303(d)-listed receiving water, inside the area of influence of the discharge.

3. Discharges that exceed the numeric effluent limit for turbidity constitute a violation of this permit.

4. Permittees whose discharges exceed the numeric effluent limit shall sample discharges daily until the violation is corrected and comply with the non-compliance notification requirements in Special Condition S5.F.

Table 5: Turbidity, Fine Sediment & Phosphorus Sampling and Limits for 303(d)-Listed Waters

Parameter identified in 303(d) listing	Parameter Sampled	Unit	Analytical Method	Sampling Frequency	Numeric Effluent Limit[1]
• Turbidity • Fine Sediment • Phosphorus	Turbidity	NTU	SM2130	Weekly, if discharging	25 NTUs, at the point where stormwater is discharged from the site; OR In compliance with the surface water quality standard for turbidity (S8.C.2.a)

[1]Permittees subject to a numeric effluent limit for turbidity may, at their discretion, choose either numeric effluent limitation based on site-specific considerations including, but not limited to, safety, access and convenience.

D. Discharges to Water Bodies on the 303(d) List for High pH

1. Permittees who discharge to segments of water bodies on the 303(d) list (Category 5) for high pH must conduct pH sampling in accordance with the table below, and comply with the numeric effluent limit of pH 6.5 to 8.5 su (Table 6).

Table 6: pH Sampling and Limits for 303(d)-Listed Waters

Parameter identified in 303(d) listing	Parameter Sampled/Units	Analytical Method	Sampling Frequency	Numeric Effluent Limit
High pH	pH /Standard Units	pH meter	Weekly, if discharging	In the range of 6.5 – 8.5

2. At the Permittee's discretion, compliance with the limit shall be assessed at one of the following locations:

   a. Directly in the 303(d)-listed waterbody segment, inside the immediate area of influence of the discharge; or

   b. Alternatively, the Permittee may measure pH at the point where the discharge leaves the construction site, rather than in the receiving water.

3. Discharges that exceed the numeric effluent limit for pH (outside the range of 6.5 – 8.5 su) constitute a violation of this permit.

4. Permittees whose discharges exceed the numeric effluent limit shall sample discharges daily until the violation is corrected and comply with the non-compliance notification requirements in Special Condition S5.F.

E. Sampling and Limits for Sites Discharging to Waters Covered by a TMDL or Another Pollution Control Plan

1. Discharges to a waterbody that is subject to a Total Maximum Daily Load (TMDL) for turbidity, fine sediment, high pH, or phosphorus must be consistent with the TMDL. Refer to http://www.ecy.wa.gov/programs/wq/tmdl/TMDLsbyWria/TMDLbyWria.html for more information on TMDLs.

   a. Where an applicable TMDL sets specific waste load allocations or requirements for discharges covered by this permit, discharges must be consistent with any specific waste load allocations or requirements established by the applicable TMDL.

      i. The Permittee must sample discharges weekly or as otherwise specified by the TMDL to evaluate compliance with the specific waste load allocations or requirements.

      ii. Analytical methods used to meet the monitoring requirements must conform to the latest revision of the Guidelines Establishing Test Procedures for the Analysis of Pollutants contained in 40 CFR Part 136. Turbidity and pH methods need not be accredited or registered unless conducted at a laboratory which must otherwise be accredited or registered.

   b. Where an applicable TMDL has established a general waste load allocation for construction stormwater discharges, but has not identified specific requirements,

compliance with Special Conditions S4 (Monitoring) and S9 (SWPPPs) will constitute compliance with the approved TMDL.

c. Where an applicable TMDL has not specified a waste load allocation for construction stormwater discharges, but has not excluded these discharges, compliance with Special Conditions S4 (Monitoring) and S9 (SWPPPs) will constitute compliance with the approved TMDL.

d. Where an applicable TMDL specifically precludes or prohibits discharges from construction activity, the operator is not eligible for coverage under this permit.

2. Applicable TMDL means a TMDL for turbidity, fine sediment, high pH, or phosphorus that is completed and approved by EPA before January 1, 2016, or before the date the operator's complete permit application is received by Ecology, whichever is later. TMDLs completed after the operator's complete permit application is received by Ecology become applicable to the Permittee only if they are imposed through an administrative order by Ecology, or through a modification of permit coverage.

S9. STORMWATER POLLUTION PREVENTION PLAN

The Permittee must prepare and properly implement an adequate Stormwater Pollution Prevention Plan (SWPPP) for construction activity in accordance with the requirements of this permit beginning with initial soil disturbance and until final stabilization.

A. The Permittee's SWPPP must meet the following objectives:

1. To implement best management practices (BMPs) to prevent erosion and sedimentation, and to identify, reduce, eliminate or prevent stormwater contamination and water pollution from construction activity.

2. To prevent violations of surface water quality, ground water quality, or sediment management standards.

3. To control peak volumetric flow rates and velocities of stormwater discharges.

B. General Requirements

1. The SWPPP must include a narrative and drawings. All BMPs must be clearly referenced in the narrative and marked on the drawings. The SWPPP narrative must include documentation to explain and justify the pollution prevention decisions made for the project. Documentation must include:

a. Information about existing site conditions (topography, drainage, soils, vegetation, etc.).

b. Potential erosion problem areas.

c. The 13 elements of a SWPPP in Special Condition S9.D.1-13, including BMPs used to address each element.

d. Construction phasing/sequence and general BMP implementation schedule.

e. The actions to be taken if BMP performance goals are not achieved—for example, a contingency plan for additional treatment and/or storage of stormwater that would violate the water quality standards if discharged.

f. Engineering calculations for ponds, treatment systems, and any other designed structures.

2. The Permittee must modify the SWPPP if, during inspections or investigations conducted by the owner/operator, or the applicable local or state regulatory authority, it is determined that the SWPPP is, or would be, ineffective in eliminating or significantly minimizing pollutants in stormwater discharges from the site. The Permittee must then:

   a. Review the SWPPP for compliance with Special Condition S9 and make appropriate revisions within 7 days of the inspection or investigation.

   b. Immediately begin the process to fully implement and maintain appropriate source control and/or treatment BMPs as soon as possible, addressing the problems no later than 10 days from the inspection or investigation. If installation of necessary treatment BMPs is not feasible within 10 days, Ecology may approve additional time when an extension is requested by a Permittee within the initial 10-day response period.

   c. Document BMP implementation and maintenance in the site log book.

   The Permittee must modify the SWPPP whenever there is a change in design, construction, operation, or maintenance at the construction site that has, or could have, a significant effect on the discharge of pollutants to waters of the State.

C. Stormwater Best Management Practices (BMPs)

BMPs must be consistent with:

1. Stormwater Management Manual for Western Washington (most current approved edition at the time this permit was issued), for sites west of the crest of the Cascade Mountains; ***or***

2. Stormwater Management Manual for Eastern Washington (most current approved edition at the time this permit was issued), for sites east of the crest of the Cascade Mountains; ***or***

3. Revisions to the manuals listed in Special Condition S9.C.1. & 2., or other stormwater management guidance documents or manuals which provide an equivalent level of pollution prevention, that are approved by Ecology and incorporated into this permit in accordance with the permit modification requirements of WAC 173-226-230; ***or***

4. Documentation in the SWPPP that the BMPs selected provide an equivalent level of pollution prevention, compared to the applicable Stormwater Management Manuals, including:

    a. The technical basis for the selection of all stormwater BMPs (scientific, technical studies, and/or modeling) that support the performance claims for the BMPs being selected.

    b. An assessment of how the selected BMP will satisfy AKART requirements and the applicable federal technology-based treatment requirements under 40 CFR part 125.3.

D. SWPPP – Narrative Contents and Requirements

The Permittee must include each of the 13 elements below in Special Condition S9.D.1-13 in the narrative of the SWPPP and implement them unless site conditions render the element unnecessary and the exemption from that element is clearly justified in the SWPPP.

1. Preserve Vegetation/Mark Clearing Limits

    a. Before beginning land-disturbing activities, including clearing and grading, clearly mark all clearing limits, sensitive areas and their buffers, and trees that are to be preserved within the construction area.

    b. Retain the duff layer, native topsoil, and natural vegetation in an undisturbed state to the maximum degree practicable.

2. Establish Construction Access

    a. Limit construction vehicle access and exit to one route, if possible.

    b. Stabilize access points with a pad of quarry spalls, crushed rock, or other equivalent BMPs, to minimize tracking sediment onto roads.

    c. Locate wheel wash or tire baths on site, if the stabilized construction entrance is not effective in preventing tracking sediment onto roads.

    d. If sediment is tracked off site, clean the affected roadway thoroughly at the end of each day, or more frequently as necessary (for example, during wet weather). Remove sediment from roads by shoveling, sweeping, or pickup and transport of the sediment to a controlled sediment disposal area.

    e. Conduct street washing only after sediment removal in accordance with Special Condition S9.D.2.d. Control street wash wastewater by pumping back on site or otherwise preventing it from discharging into systems tributary to waters of the State.

3. Control Flow Rates

    a. Protect properties and waterways downstream of development sites from erosion and the associated discharge of turbid waters due to increases in the

velocity and peak volumetric flow rate of stormwater runoff from the project site, as required by local plan approval authority.

b. Where necessary to comply with Special Condition S9.D.3.a, construct stormwater retention or detention facilities as one of the first steps in grading. Assure that detention facilities function properly before constructing site improvements (for example, impervious surfaces).

c. If permanent infiltration ponds are used for flow control during construction, protect these facilities from siltation during the construction phase.

4. Install Sediment Controls

The Permittee must design, install and maintain effective erosion controls and sediment controls to minimize the discharge of pollutants. At a minimum, the Permittee must design, install and maintain such controls to:

a. Construct sediment control BMPs (sediment ponds, traps, filters, infiltration facilities, etc.) as one of the first steps in grading. These BMPs must be functional before other land disturbing activities take place.

b. Minimize sediment discharges from the site. The design, installation and maintenance of erosion and sediment controls must address factors such as the amount, frequency, intensity and duration of precipitation, the nature of resulting stormwater runoff, and soil characteristics, including the range of soil particle sizes expected to be present on the site.

c. Direct stormwater runoff from disturbed areas through a sediment pond or other appropriate sediment removal BMP, before the runoff leaves a construction site or before discharge to an infiltration facility. Runoff from fully stabilized areas may be discharged without a sediment removal BMP, but must meet the flow control performance standard of Special Condition S9.D.3.a.

d. Locate BMPs intended to trap sediment on site in a manner to avoid interference with the movement of juvenile salmonids attempting to enter off-channel areas or drainages.

e. Provide and maintain natural buffers around surface waters, direct stormwater to vegetated areas to increase sediment removal and maximize stormwater infiltration, unless infeasible.

f. Where feasible, design outlet structures that withdraw impounded stormwater from the surface to avoid discharging sediment that is still suspended lower in the water column.

5. Stabilize Soils

a. The Permittee must stabilize exposed and unworked soils by application of effective BMPs that prevent erosion. Applicable BMPs include, but are not limited to: temporary and permanent seeding, sodding, mulching, plastic covering, erosion control fabrics and matting, soil application of polyacrylamide

(PAM), the early application of gravel base on areas to be paved, and dust control.

b. The Permittee must control stormwater volume and velocity within the site to minimize soil erosion.

c. The Permittee must control stormwater discharges, including both peak flow rates and total stormwater volume, to minimize erosion at outlets and to minimize downstream channel and stream bank erosion.

d. Depending on the geographic location of the project, the Permittee must not allow soils to remain exposed and unworked for more than the time periods set forth below to prevent erosion:

West of the Cascade Mountains Crest
During the dry season (May 1 - September 30): 7 days
During the wet season (October 1 - April 30): 2 days

East of the Cascade Mountains Crest, except for Central Basin*
During the dry season (July 1 - September 30): 10 days
During the wet season (October 1 - June 30): 5 days

The Central Basin*, East of the Cascade Mountains Crest
During the dry season (July 1 - September 30): 30 days
During the wet season (October 1 - June 30): 15 days

*Note: The Central Basin is defined as the portions of Eastern Washington with mean annual precipitation of less than 12 inches.

e. The Permittee must stabilize soils at the end of the shift before a holiday or weekend if needed based on the weather forecast.

f. The Permittee must stabilize soil stockpiles from erosion, protected with sediment trapping measures, and where possible, be located away from storm drain inlets, waterways, and drainage channels.

g. The Permittee must minimize the amount of soil exposed during construction activity.

h. The Permittee must minimize the disturbance of steep slopes.

i. The Permittee must minimize soil compaction and, unless infeasible, preserve topsoil.

6. Protect Slopes

a. The Permittee must design and construct cut-and-fill slopes in a manner to minimize erosion. Applicable practices include, but are not limited to, reducing continuous length of slope with terracing and diversions, reducing slope steepness, and roughening slope surfaces (for example, track walking).

b. The Permittee must divert off-site stormwater (run-on) or ground water away from slopes and disturbed areas with interceptor dikes, pipes, and/or swales. Off-site stormwater should be managed separately from stormwater generated on the site.

c. At the top of slopes, collect drainage in pipe slope drains or protected channels to prevent erosion.

   i. West of the Cascade Mountains Crest: Temporary pipe slope drains must handle the peak 10-minute flow rate from a Type 1A, 10-year, 24-hour frequency storm for the developed condition. Alternatively, the 10-year, 1-hour flow rate predicted by an approved continuous runoff model, increased by a factor of 1.6, may be used. The hydrologic analysis must use the existing land cover condition for predicting flow rates from tributary areas outside the project limits. For tributary areas on the project site, the analysis must use the temporary or permanent project land cover condition, whichever will produce the highest flow rates. If using the Western Washington Hydrology Model (WWHM) to predict flows, bare soil areas should be modeled as "landscaped area."

   ii. East of the Cascade Mountains Crest: Temporary pipe slope drains must handle the expected peak flow rate from a 6-month, 3-hour storm for the developed condition, referred to as the short duration storm.

d. Place excavated material on the uphill side of trenches, consistent with safety and space considerations.

e. Place check dams at regular intervals within constructed channels that are cut down a slope.

7. Protect Drain Inlets

   a. Protect all storm drain inlets made operable during construction so that stormwater runoff does not enter the conveyance system without first being filtered or treated to remove sediment.

   b. Clean or remove and replace inlet protection devices when sediment has filled one-third of the available storage (unless a different standard is specified by the product manufacturer).

8. Stabilize Channels and Outlets

   a. Design, construct and stabilize all on-site conveyance channels to prevent erosion from the following expected peak flows:

      i. West of the Cascade Mountains Crest: Channels must handle the peak 10-minute flow rate from a Type 1A, 10-year, 24-hour frequency storm for the developed condition. Alternatively, the 10-year, 1-hour flow rate indicated by an approved continuous runoff model, increased by a factor of 1.6, may be used. The hydrologic analysis must use the existing land

cover condition for predicting flow rates from tributary areas outside the project limits. For tributary areas on the project site, the analysis must use the temporary or permanent project land cover condition, whichever will produce the highest flow rates. If using the WWHM to predict flows, bare soil areas should be modeled as "landscaped area."

ii. East of the Cascade Mountains Crest: Channels must handle the expected peak flow rate from a 6-month, 3-hour storm for the developed condition, referred to as the short duration storm.

b. Provide stabilization, including armoring material, adequate to prevent erosion of outlets, adjacent stream banks, slopes, and downstream reaches at the outlets of all conveyance systems.

9. Control Pollutants

Design, install, implement and maintain effective pollution prevention measures to minimize the discharge of pollutants. The Permittee must:

a. Handle and dispose of all pollutants, including waste materials and demolition debris that occur on site in a manner that does not cause contamination of stormwater.

b. Provide cover, containment, and protection from vandalism for all chemicals, liquid products, petroleum products, and other materials that have the potential to pose a threat to human health or the environment. On-site fueling tanks must include secondary containment. Secondary containment means placing tanks or containers within an impervious structure capable of containing 110% of the volume contained in the largest tank within the containment structure. Double-walled tanks do not require additional secondary containment.

c. Conduct maintenance, fueling, and repair of heavy equipment and vehicles using spill prevention and control measures. Clean contaminated surfaces immediately following any spill incident.

d. Discharge wheel wash or tire bath wastewater to a separate on-site treatment system that prevents discharge to surface water, such as closed-loop recirculation or upland land application, or to the sanitary sewer with local sewer district approval.

e. Apply fertilizers and pesticides in a manner and at application rates that will not result in loss of chemical to stormwater runoff. Follow manufacturers' label requirements for application rates and procedures.

f. Use BMPs to prevent contamination of stormwater runoff by pH-modifying sources. The sources for this contamination include, but are not limited to: bulk cement, cement kiln dust, fly ash, new concrete washing and curing waters, recycled concrete stockpiles, waste streams generated from concrete grinding and sawing, exposed aggregate processes, dewatering concrete vaults, concrete

pumping and mixer washout waters. (Also refer to the definition for "concrete wastewater" in Appendix A--Definitions.)

g. Adjust the pH of stormwater or authorized non-stormwater if necessary to prevent an exceedance of groundwater and/or surface water quality standards.

h. Assure that washout of concrete trucks is performed off-site or in designated concrete washout areas only. Do not wash out concrete trucks or concrete handling equipment onto the ground, or into storm drains, open ditches, streets, or streams. Do not dump excess concrete on site, except in designated concrete washout areas. Concrete spillage or concrete discharge to surface waters of the State is prohibited.

i. Obtain written approval from Ecology before using any chemical treatment, with the exception of CO_2 or dry ice used to adjust pH.

j. Uncontaminated water from water-only based shaft drilling for construction of building, road, and bridge foundations may be infiltrated provided the wastewater is managed in a way that prohibits discharge to surface waters. Prior to infiltration, water from water-only based shaft drilling that comes into contact with curing concrete must be neutralized until pH is in the range of 6.5 to 8.5 (su).

10. Control Dewatering

a. Permittees must discharge foundation, vault, and trench dewatering water, which have characteristics similar to stormwater runoff at the site, into a controlled conveyance system before discharge to a sediment trap or sediment pond.

b. Permittees may discharge clean, non-turbid dewatering water, such as well-point ground water, to systems tributary to, or directly into surface waters of the State, as specified in Special Condition S9.D.8, provided the dewatering flow does not cause erosion or flooding of receiving waters. Do not route clean dewatering water through stormwater sediment ponds. Note that “surface waters of the State” may exist on a construction site as well as off site; for example, a creek running through a site.

c. Other dewatering treatment or disposal options may include:

i. Infiltration.

ii. Transport off site in a vehicle, such as a vacuum flush truck, for legal disposal in a manner that does not pollute state waters.

iii. Ecology-approved on-site chemical treatment or other suitable treatment technologies (see S9.D.9.i. regarding chemical treatment written approval).

iv. Sanitary or combined sewer discharge with local sewer district approval, if there is no other option.

v. Use of a sedimentation bag with discharge to a ditch or swale for small volumes of localized dewatering.

d. Permittees must handle highly turbid or contaminated dewatering water separately from stormwater.

11. Maintain BMPs

a. Permittees must maintain and repair all temporary and permanent erosion and sediment control BMPs as needed to assure continued performance of their intended function in accordance with BMP specifications.

b. Permittees must remove all temporary erosion and sediment control BMPs within 30 days after achieving final site stabilization or after the temporary BMPs are no longer needed.

12. Manage the Project

a. Phase development projects to the maximum degree practicable and take into account seasonal work limitations.

b. Inspection and monitoring – Inspect, maintain and repair all BMPs as needed to assure continued performance of their intended function. Conduct site inspections and monitoring in accordance with Special Condition S4.

c. Maintaining an updated construction SWPPP – Maintain, update, and implement the SWPPP in accordance with Special Conditions S3, S4 and S9.

13. Protect Low Impact Development (LID) BMPs

The primary purpose of LID BMPs/On-site LID Stormwater Management BMPs is to reduce the disruption of the natural site hydrology. LID BMPs are permanent facilities.

a. Permittees must protect all Bioretention and Rain Garden facilities from sedimentation through installation and maintenance of erosion and sediment control BMPs on portions of the site that drain into the Bioretention and/or Rain Garden facilities. Restore the facilities to their fully functioning condition if they accumulate sediment during construction. Restoring the facility must include removal of sediment and any sediment-laden Bioretention/Rain Garden soils, and replacing the removed soils with soils meeting the design specification.

b. Permittees must maintain the infiltration capabilities of Bioretention and Rain Garden facilities by protecting against compaction by construction equipment and foot traffic. Protect completed lawn and landscaped areas from compaction due to construction equipment.

c. Permittees must control erosion and avoid introducing sediment from surrounding land uses onto permeable pavements. Do not allow muddy

construction equipment on the base material or pavement. Do not allow sediment-laden runoff onto permeable pavements.

d. Permittees must clean permeable pavements fouled with sediments or no longer passing an initial infiltration test using local stormwater manual methodology or the manufacturer's procedures.

e. Permittees must keep all heavy equipment off existing soils under LID facilities that have been excavated to final grade to retain the infiltration rate of the soils.

E. SWPPP – Map Contents and Requirements

The Permittee's SWPPP must also include a vicinity map or general location map (for example, a USGS quadrangle map, a portion of a county or city map, or other appropriate map) with enough detail to identify the location of the construction site and receiving waters within one mile of the site.

The SWPPP must also include a legible site map (or maps) showing the entire construction site. The following features must be identified, unless not applicable due to site conditions:

1. The direction of north, property lines, and existing structures and roads.
2. Cut and fill slopes indicating the top and bottom of slope catch lines.
3. Approximate slopes, contours, and direction of stormwater flow before and after major grading activities.
4. Areas of soil disturbance and areas that will not be disturbed.
5. Locations of structural and nonstructural controls (BMPs) identified in the SWPPP.
6. Locations of off-site material, stockpiles, waste storage, borrow areas, and vehicle/equipment storage areas.
7. Locations of all surface water bodies, including wetlands.
8. Locations where stormwater or non-stormwater discharges off-site and/or to a surface waterbody, including wetlands.
9. Location of water quality sampling station(s), if sampling is required by state or local permitting authority.
10. Areas where final stabilization has been accomplished and no further construction-phase permit requirements apply.
11. Location or proposed location of LID facilities.

S10. NOTICE OF TERMINATION

A. The site is eligible for termination of coverage when it has met any of the following conditions:

1. The site has undergone final stabilization, the Permittee has removed all temporary BMPs (except biodegradable BMPs clearly manufactured with the intention for the material to be left in place and not interfere with maintenance or land use), and all stormwater discharges associated with construction activity have been eliminated; ***or***

2. All portions of the site that have not undergone final stabilization per Special Condition S10.A.1 have been sold and/or transferred (per General Condition G9), and the Permittee no longer has operational control of the construction activity; ***or***

3. For residential construction only, the Permittee has completed temporary stabilization and the homeowners have taken possession of the residences.

B. When the site is eligible for termination, the Permittee must submit a complete and accurate Notice of Termination (NOT) form, signed in accordance with General Condition G2, to:

Department of Ecology
Water Quality Program – Construction Stormwater
PO Box 47696
Olympia, Washington 98504-7696

When an electronic termination form is available, the Permittee may choose to submit a complete and accurate Notice of Termination (NOT) form through the Water Quality Permitting Portal rather than mailing a hardcopy as noted above.

The termination is effective on the thirty-first calendar day following the date Ecology receives a complete NOT form, unless Ecology notifies the Permittee that the termination request is denied because the Permittee has not met the eligibility requirements in Special Condition S10.A.

Permittees are required to comply with all conditions and effluent limitations in the permit until the permit has been terminated.

Permittees transferring the property to a new property owner or operator/Permittee are required to complete and submit the Notice of Transfer form to Ecology, but are not required to submit a Notice of Termination form for this type of transaction.

GENERAL CONDITIONS

G1. DISCHARGE VIOLATIONS

All discharges and activities authorized by this general permit must be consistent with the terms and conditions of this general permit. Any discharge of any pollutant more frequent than or at a level in excess of that identified and authorized by the general permit must constitute a violation of the terms and conditions of this permit.

G2. SIGNATORY REQUIREMENTS

A. All permit applications must bear a certification of correctness to be signed:

1. In the case of corporations, by a responsible corporate officer;
2. In the case of a partnership, by a general partner of a partnership;
3. In the case of sole proprietorship, by the proprietor; ***or***
4. In the case of a municipal, state, or other public facility, by either a principal executive officer or ranking elected official.

B. All reports required by this permit and other information requested by Ecology (including NOIs, NOTs, and Transfer of Coverage forms) must be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:

1. The authorization is made in writing by a person described above and submitted to Ecology.
2. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility, such as the position of plant manager, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters.

C. Changes to authorization. If an authorization under paragraph G2.B.2 above is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph G2.B.2 above must be submitted to Ecology prior to or together with any reports, information, or applications to be signed by an authorized representative.

D. Certification. Any person signing a document under this section must make the following certification:

> "I certify under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering information, the information submitted is, to the best of my

knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

G3. RIGHT OF INSPECTION AND ENTRY

The Permittee must allow an authorized representative of Ecology, upon the presentation of credentials and such other documents as may be required by law:

A. To enter upon the premises where a discharge is located or where any records are kept under the terms and conditions of this permit.

B. To have access to and copy – at reasonable times and at reasonable cost – any records required to be kept under the terms and conditions of this permit.

C. To inspect – at reasonable times – any facilities, equipment (including monitoring and control equipment), practices, methods, or operations regulated or required under this permit.

D. To sample or monitor – at reasonable times – any substances or parameters at any location for purposes of assuring permit compliance or as otherwise authorized by the Clean Water Act.

G4. GENERAL PERMIT MODIFICATION AND REVOCATION

This permit may be modified, revoked and reissued, or terminated in accordance with the provisions of Chapter 173-226 WAC. Grounds for modification, revocation and reissuance, or termination include, but are not limited to, the following:

A. When a change occurs in the technology or practices for control or abatement of pollutants applicable to the category of dischargers covered under this permit.

B. When effluent limitation guidelines or standards are promulgated pursuant to the CWA or Chapter 90.48 RCW, for the category of dischargers covered under this permit.

C. When a water quality management plan containing requirements applicable to the category of dischargers covered under this permit is approved, ***or***

D. When information is obtained that indicates cumulative effects on the environment from dischargers covered under this permit are unacceptable.

G5. REVOCATION OF COVERAGE UNDER THE PERMIT

Pursuant to Chapter 43.21B RCW and Chapter 173-226 WAC, the Director may terminate coverage for any discharger under this permit for cause. Cases where coverage may be terminated include, but are not limited to, the following:

A. Violation of any term or condition of this permit.

B. Obtaining coverage under this permit by misrepresentation or failure to disclose fully all relevant facts.

C. A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge.

D. Failure or refusal of the Permittee to allow entry as required in RCW 90.48.090.

E. A determination that the permitted activity endangers human health or the environment, or contributes to water quality standards violations.

F. Nonpayment of permit fees or penalties assessed pursuant to RCW 90.48.465 and Chapter 173-224 WAC.

G. Failure of the Permittee to satisfy the public notice requirements of WAC 173-226-130(5), when applicable.

The Director may require any discharger under this permit to apply for and obtain coverage under an individual permit or another more specific general permit. Permittees who have their coverage revoked for cause according to WAC 173-226-240 may request temporary coverage under this permit during the time an individual permit is being developed, provided the request is made within ninety (90) days from the time of revocation and is submitted along with a complete individual permit application form.

G6. REPORTING A CAUSE FOR MODIFICATION

The Permittee must submit a new application, or a supplement to the previous application, whenever a material change to the construction activity or in the quantity or type of discharge is anticipated which is not specifically authorized by this permit. This application must be submitted at least sixty (60) days prior to any proposed changes. Filing a request for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not relieve the Permittee of the duty to comply with the existing permit until it is modified or reissued.

G7. COMPLIANCE WITH OTHER LAWS AND STATUTES

Nothing in this permit will be construed as excusing the Permittee from compliance with any applicable federal, state, or local statutes, ordinances, or regulations.

G8. DUTY TO REAPPLY

The Permittee must apply for permit renewal at least 180 days prior to the specified expiration date of this permit. The Permittee must reapply using the electronic application form (NOI) available on Ecology's website. Permittees unable to submit electronically (for example, those who do not have an internet connection) must contact Ecology to request a waiver and obtain instructions on how to obtain a paper NOI.

Department of Ecology
Water Quality Program - Construction Stormwater
PO Box 47696
Olympia, Washington 98504-7696

G9. TRANSFER OF GENERAL PERMIT COVERAGE

Coverage under this general permit is automatically transferred to a new discharger, including operators of lots/parcels within a common plan of development or sale, if:

A. A written agreement (Transfer of Coverage Form) between the current discharger (Permittee) and new discharger, signed by both parties and containing a specific date for transfer of permit responsibility, coverage, and liability (including any Administrative Orders associated with the Permit) is submitted to the Director; and

B. The Director does not notify the current discharger and new discharger of the Director's intent to revoke coverage under the general permit. If this notice is not given, the transfer is effective on the date specified in the written agreement.

When a current discharger (Permittee) transfers a portion of a permitted site, the current discharger must also submit an updated application form (NOI) to the Director indicating the remaining permitted acreage after the transfer.

G10. REMOVED SUBSTANCES

The Permittee must not re-suspend or reintroduce collected screenings, grit, solids, sludges, filter backwash, or other pollutants removed in the course of treatment or control of stormwater to the final effluent stream for discharge to state waters.

G11. DUTY TO PROVIDE INFORMATION

The Permittee must submit to Ecology, within a reasonable time, all information that Ecology may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Permittee must also submit to Ecology, upon request, copies of records required to be kept by this permit [40 CFR 122.41(h)].

G12. OTHER REQUIREMENTS OF 40 CFR

All other requirements of 40 CFR 122.41 and 122.42 are incorporated in this permit by reference.

G13. ADDITIONAL MONITORING

Ecology may establish specific monitoring requirements in addition to those contained in this permit by administrative order or permit modification.

G14. PENALTIES FOR VIOLATING PERMIT CONDITIONS

Any person who is found guilty of willfully violating the terms and conditions of this permit shall be deemed guilty of a crime, and upon conviction thereof shall be punished by a fine of up to ten thousand dollars ($10,000) and costs of prosecution, or by imprisonment at the discretion of the court. Each day upon which a willful violation occurs may be deemed a separate and additional violation.

Any person who violates the terms and conditions of a waste discharge permit shall incur, in addition to any other penalty as provided by law, a civil penalty in the amount of up to ten thousand dollars ($10,000) for every such violation. Each and every such violation shall be a separate and distinct offense, and in case of a continuing violation, every day's continuance shall be deemed to be a separate and distinct violation.

G15. UPSET

Definition – "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

An upset constitutes an affirmative defense to an action brought for noncompliance with such technology-based permit effluent limitations if the requirements of the following paragraph are met.

A Permittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs or other relevant evidence that: 1) an upset occurred and that the Permittee can identify the cause(s) of the upset; 2) the permitted facility was being properly operated at the time of the upset; 3) the Permittee submitted notice of the upset as required in Special Condition S5.F, and; 4) the Permittee complied with any remedial measures required under this permit.

In any enforcement proceeding, the Permittee seeking to establish the occurrence of an upset has the burden of proof.

G16. PROPERTY RIGHTS

This permit does not convey any property rights of any sort, or any exclusive privilege.

G17. DUTY TO COMPLY

The Permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

G18. TOXIC POLLUTANTS

The Permittee must comply with effluent standards or prohibitions established under Section 307(a) of the Clean Water Act for toxic pollutants within the time provided in the regulations that establish those standards or prohibitions, even if this permit has not yet been modified to incorporate the requirement.

G19. PENALTIES FOR TAMPERING

The Clean Water Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than two years per violation, or by both. If a conviction of a person is for a violation committed after a first conviction of such person under this condition, punishment shall be a fine of not more than $20,000 per day of violation, or imprisonment of not more than four (4) years, or both.

G20. REPORTING PLANNED CHANGES

The Permittee must, as soon as possible, give notice to Ecology of planned physical alterations, modifications or additions to the permitted construction activity. The Permittee should be aware that, depending on the nature and size of the changes to the original permit, a new public notice and other permit process requirements may be required. Changes in activities that require reporting to Ecology include those that will result in:

A. The permitted facility being determined to be a new source pursuant to 40 CFR 122.29(b).

B. A significant change in the nature or an increase in quantity of pollutants discharged, including but not limited to: for sites 5 acres or larger, a 20% or greater increase in acreage disturbed by construction activity.

C. A change in or addition of surface water(s) receiving stormwater or non-stormwater from the construction activity.

D. A change in the construction plans and/or activity that affects the Permittee's monitoring requirements in Special Condition S4.

Following such notice, permit coverage may be modified, or revoked and reissued pursuant to 40 CFR 122.62(a) to specify and limit any pollutants not previously limited. Until such modification is effective, any new or increased discharge in excess of permit limits or not specifically authorized by this permit constitutes a violation.

G21. REPORTING OTHER INFORMATION

Where the Permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to Ecology, it must promptly submit such facts or information.

G22. REPORTING ANTICIPATED NON-COMPLIANCE

The Permittee must give advance notice to Ecology by submission of a new application or supplement thereto at least forty-five (45) days prior to commencement of such discharges, of any facility expansions, production increases, or other planned changes, such as process modifications, in the permitted facility or activity which may result in noncompliance with permit limits or conditions. Any maintenance of facilities, which might necessitate

unavoidable interruption of operation and degradation of effluent quality, must be scheduled during non-critical water quality periods and carried out in a manner approved by Ecology.

G23. REQUESTS TO BE EXCLUDED FROM COVERAGE UNDER THE PERMIT

Any discharger authorized by this permit may request to be excluded from coverage under the general permit by applying for an individual permit. The discharger must submit to the Director an application as described in WAC 173-220-040 or WAC 173-216-070, whichever is applicable, with reasons supporting the request. These reasons will fully document how an individual permit will apply to the applicant in a way that the general permit cannot. Ecology may make specific requests for information to support the request. The Director will either issue an individual permit or deny the request with a statement explaining the reason for the denial. When an individual permit is issued to a discharger otherwise subject to the construction stormwater general permit, the applicability of the construction stormwater general permit to that Permittee is automatically terminated on the effective date of the individual permit.

G24. APPEALS

A. The terms and conditions of this general permit, as they apply to the appropriate class of dischargers, are subject to appeal by any person within 30 days of issuance of this general permit, in accordance with Chapter 43.21B RCW, and Chapter 173-226 WAC.

B. The terms and conditions of this general permit, as they apply to an individual discharger, are appealable in accordance with Chapter 43.21B RCW within 30 days of the effective date of coverage of that discharger. Consideration of an appeal of general permit coverage of an individual discharger is limited to the general permit's applicability or nonapplicability to that individual discharger.

C. The appeal of general permit coverage of an individual discharger does not affect any other dischargers covered under this general permit. If the terms and conditions of this general permit are found to be inapplicable to any individual discharger(s), the matter shall be remanded to Ecology for consideration of issuance of an individual permit or permits.

G25. SEVERABILITY

The provisions of this permit are severable, and if any provision of this permit, or application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit shall not be affected thereby.

G26. BYPASS PROHIBITED

A. Bypass Procedures

Bypass, which is the intentional diversion of waste streams from any portion of a treatment facility, is prohibited for stormwater events below the design criteria for

stormwater management. Ecology may take enforcement action against a Permittee for bypass unless one of the following circumstances (1, 2, 3 or 4) is applicable.

1. Bypass of stormwater is consistent with the design criteria and part of an approved management practice in the applicable stormwater management manual.

2. Bypass for essential maintenance without the potential to cause violation of permit limits or conditions.

   Bypass is authorized if it is for essential maintenance and does not have the potential to cause violations of limitations or other conditions of this permit, or adversely impact public health.

3. Bypass of stormwater is unavoidable, unanticipated, and results in noncompliance of this permit.

   This bypass is permitted only if:

   a. Bypass is unavoidable to prevent loss of life, personal injury, or severe property damage. "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which would cause them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass.

   b. There are no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, maintenance during normal periods of equipment downtime (but not if adequate backup equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventative maintenance), or transport of untreated wastes to another treatment facility.

   c. Ecology is properly notified of the bypass as required in Special Condition S5.F of this permit.

4. A planned action that would cause bypass of stormwater and has the potential to result in noncompliance of this permit during a storm event.

   The Permittee must notify Ecology at least thirty (30) days before the planned date of bypass. The notice must contain:

   a. A description of the bypass and its cause.

   b. An analysis of all known alternatives which would eliminate, reduce, or mitigate the need for bypassing.

   c. A cost-effectiveness analysis of alternatives including comparative resource damage assessment.

   d. The minimum and maximum duration of bypass under each alternative.

   e. A recommendation as to the preferred alternative for conducting the bypass.

f. The projected date of bypass initiation.

g. A statement of compliance with SEPA.

h. A request for modification of water quality standards as provided for in WAC 173-201A-110, if an exceedance of any water quality standard is anticipated.

i. Steps taken or planned to reduce, eliminate, and prevent reoccurrence of the bypass.

5. For probable construction bypasses, the need to bypass is to be identified as early in the planning process as possible. The analysis required above must be considered during preparation of the Stormwater Pollution Prevention Plan (SWPPP) and must be included to the extent practical. In cases where the probable need to bypass is determined early, continued analysis is necessary up to and including the construction period in an effort to minimize or eliminate the bypass.

   Ecology will consider the following before issuing an administrative order for this type bypass:

   a. If the bypass is necessary to perform construction or maintenance-related activities essential to meet the requirements of this permit.

   b. If there are feasible alternatives to bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, stopping production, maintenance during normal periods of equipment down time, or transport of untreated wastes to another treatment facility.

   c. If the bypass is planned and scheduled to minimize adverse effects on the public and the environment.

   After consideration of the above and the adverse effects of the proposed bypass and any other relevant factors, Ecology will approve, conditionally approve, or deny the request. The public must be notified and given an opportunity to comment on bypass incidents of significant duration, to the extent feasible. Approval of a request to bypass will be by administrative order issued by Ecology under RCW 90.48.120.

B. Duty to Mitigate

The Permittee is required to take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

APPENDIX A – DEFINITIONS

AKART is an acronym for "all known, available, and reasonable methods of prevention, control, and treatment." AKART represents the most current methodology that can be reasonably required for preventing, controlling, or abating the *pollutants* and controlling pollution associated with a discharge.

Applicable TMDL means a TMDL for turbidity, fine sediment, high pH, or phosphorus, which was completed and approved by EPA before January 1, 2016, or before the date the operator's complete permit application is received by Ecology, whichever is later.

Applicant means an *operator* seeking coverage under this permit.

Benchmark means a *pollutant* concentration used as a permit threshold, below which a *pollutant* is considered unlikely to cause a water quality violation, and above which it may. When *pollutant* concentrations exceed benchmarks, corrective action requirements take effect. Benchmark values are not water quality standards and are not numeric effluent limitations; they are indicator values.

Best Management Practices (BMPs) means schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural and/or managerial practices to prevent or reduce the pollution of waters of the State. BMPs include treatment systems, operating procedures, and practices to control: *stormwater* associated with construction activity, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Buffer means an area designated by a local *jurisdiction* that is contiguous to and intended to protect a sensitive area.

Bypass means the intentional diversion of waste streams from any portion of a treatment facility.

Calendar Day A period of 24 consecutive hours starting at 12:00 midnight and ending the following 12:00 midnight.

Calendar Week (same as **Week**) means a period of seven consecutive days starting at 12:01 a.m. (0:01 hours) on Sunday.

Certified Erosion and Sediment Control Lead (CESCL) means a person who has current certification through an approved erosion and sediment control training program that meets the minimum training standards established by Ecology (see BMP C160 in the SWMM).

Chemical Treatment means the addition of chemicals to *stormwater* and/or authorized non-stormwater prior to filtration and discharge to surface waters.

Clean Water Act (CWA) means the Federal Water Pollution Control Act enacted by Public Law 92-500, as amended by Public Laws 95-217, 95-576, 96-483, and 97-117; USC 1251 et seq.

Combined Sewer means a sewer which has been designed to serve as a sanitary sewer and a storm sewer, and into which inflow is allowed by local ordinance.

Common Plan of Development or Sale means a site where multiple separate and distinct *construction activities* may be taking place at different times on different schedules and/or by different contractors, but still under a single plan. Examples include: 1) phased projects and projects with multiple filings or lots, even if the separate phases or filings/lots will be constructed under separate contract or by separate owners (e.g., a development where lots are sold to separate builders); 2) a development plan that may be phased over multiple years, but is still under a consistent plan for long-term development; 3) projects in a contiguous area that may be unrelated but still under the same contract, such as construction of a building extension and a new parking lot at the same facility; and 4) linear projects such as roads, pipelines, or utilities. If the project is part of a common plan of development or sale, the disturbed area of the entire plan must be used in determining permit requirements.

Composite Sample means a mixture of grab samples collected at the same sampling point at different times, formed either by continuous sampling or by mixing discrete samples. May be "time-composite" (collected at constant time intervals) or "flow-proportional" (collected either as a constant sample volume at time intervals proportional to stream flow, or collected by increasing the volume of each aliquot as the flow increases while maintaining a constant time interval between the aliquots.

Concrete Wastewater means any water used in the production, pouring and/or clean-up of concrete or concrete products, and any water used to cut, grind, wash, or otherwise modify concrete or concrete products. Examples include water used for or resulting from concrete truck/mixer/pumper/tool/chute rinsing or washing, concrete saw cutting and surfacing (sawing, coring, grinding, roughening, hydro-demolition, bridge and road surfacing). When *stormwater* comingles with concrete wastewater, the resulting water is considered concrete wastewater and must be managed to prevent discharge to *waters of the State*, including *ground water*.

Construction Activity means land disturbing operations including clearing, grading or excavation which disturbs the surface of the land. Such activities may include road construction, construction of residential houses, office buildings, or industrial buildings, site preparation, soil compaction, movement and stockpiling of topsoils, and demolition activity.

Contaminant means any hazardous substance that does not occur naturally or occurs at greater than natural background levels. See definition of "*hazardous substance*" and WAC 173-340-200.

Contaminated Groundwater means groundwater which contains *contaminants*, *pollutants*, or *hazardous substances* that do not occur naturally or occur at levels greater than natural background.

Contaminated Soil means soil which contains *contaminants*, *pollutants*, or *hazardous substances* that do not occur naturally or occur at levels greater than natural background.

Demonstrably Equivalent means that the technical basis for the selection of all stormwater BMPs is documented within a SWPPP, including:

1. The method and reasons for choosing the stormwater BMPs selected.

2. The *pollutant* removal performance expected from the BMPs selected.
3. The technical basis supporting the performance claims for the BMPs selected, including any available data concerning field performance of the BMPs selected.
4. An assessment of how the selected BMPs will comply with state water quality standards.
5. An assessment of how the selected BMPs will satisfy both applicable federal technology-based treatment requirements and state requirements to use all known, available, and reasonable methods of prevention, control, and treatment (AKART).

Department means the Washington State Department of Ecology.

Detention means the temporary storage of *stormwater* to improve quality and/or to reduce the mass flow rate of discharge.

Dewatering means the act of pumping *ground water* or *stormwater* away from an active construction site.

Director means the Director of the Washington State Department of Ecology or his/her authorized representative.

Discharger means an owner or *operator* of any facility or activity subject to regulation under Chapter 90.48 RCW or the Federal Clean Water Act.

Domestic Wastewater means water carrying human wastes, including kitchen, bath, and laundry wastes from residences, buildings, industrial establishments, or other places, together with such ground water infiltration or surface waters as may be present.

Ecology means the Washington State Department of Ecology.

Engineered Soils means the use of soil amendments including, but not limited, to Portland cement treated base (CTB), cement kiln dust (CKD), or fly ash to achieve certain desirable soil characteristics.

Equivalent BMPs means operational, source control, treatment, or innovative BMPs which result in equal or better quality of stormwater discharge to *surface water* or to *ground water* than BMPs selected from the SWMM.

Erosion means the wearing away of the land surface by running water, wind, ice, or other geological agents, including such processes as gravitational creep.

Erosion and Sediment Control BMPs means BMPs intended to prevent erosion and sedimentation, such as preserving natural vegetation, seeding, mulching and matting, plastic covering, filter fences, sediment traps, and ponds. Erosion and sediment control BMPs are synonymous with stabilization and structural BMPs.

Federal Operator is an entity that meets the definition of "*Operator*" in this permit and is either any department, agency or instrumentality of the executive, legislative, and judicial branches of

the Federal government of the United States, or another entity, such as a private contractor, performing construction activity for any such department, agency, or instrumentality.

Final Stabilization (same as **fully stabilized** or **full stabilization**) means the establishment of a permanent vegetative cover, or equivalent permanent stabilization measures (examples of permanent non-vegetative stabilization methods include, but are not limited to riprap, gabions or geotextiles) which prevents erosion.

Ground Water means water in a saturated zone or stratum beneath the land surface or a surface waterbody.

Hazardous Substance means any dangerous or extremely hazardous waste as defined in RCW 70.105.010 (5) and (6), or any dangerous or extremely dangerous waste as designated by rule under chapter 70.105 RCW; any hazardous substance as defined in RCW 70.105.010(10) or any hazardous substance as defined by rule under chapter 70.105 RCW; any substance that, on the effective date of this section, is a hazardous substance under section 101(14) of the federal cleanup law, 42 U.S.C., Sec. 9601(14); petroleum or petroleum products; and any substance or category of substances, including solid waste decomposition products, determined by the director by rule to present a threat to human health or the environment if released into the environment. The term hazardous substance does not include any of the following when contained in an underground storage tank from which there is not a release: crude oil or any fraction thereof or petroleum, if the tank is in compliance with all applicable federal, state, and local law.

Injection Well means a well that is used for the subsurface emplacement of fluids. (See Well.)

Jurisdiction means a political unit such as a city, town or county; incorporated for local self-government.

National Pollutant Discharge Elimination System (NPDES) means the national program for issuing, modifying, revoking and reissuing, terminating, monitoring, and enforcing permits, and imposing and enforcing pretreatment requirements, under sections 307, 402, 318, and 405 of the Federal Clean Water Act, for the discharge of *pollutants* to surface waters of the State from point sources. These permits are referred to as NPDES permits and, in Washington State, are administered by the Washington State Department of Ecology.

Notice of Intent (NOI) means the application for, or a request for coverage under this general permit pursuant to WAC 173-226-200.

Notice of Termination (NOT) means a request for termination of coverage under this general permit as specified by Special Condition S10 of this permit.

Operator means any party associated with a construction project that meets either of the following two criteria:

- The party has operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications; or

- The party has day-to-day operational control of those activities at a project that are necessary to ensure compliance with a SWPPP for the site or other permit conditions (e.g., they are authorized to direct workers at a site to carry out activities required by the SWPPP or comply with other permit conditions).

Permittee means individual or entity that receives notice of coverage under this general permit.

pH means a liquid's measure of acidity or alkalinity. A pH of 7 is defined as neutral. Large variations above or below this value are considered harmful to most aquatic life.

pH Monitoring Period means the time period in which the pH of *stormwater* runoff from a site must be tested a minimum of once every seven days to determine if *stormwater* pH is between 6.5 and 8.5.

Point Source means any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, and container from which *pollutants* are or may be discharged to surface waters of the State. This term does not include return flows from irrigated agriculture. (See Fact Sheet for further explanation.)

Pollutant means dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, domestic sewage sludge (biosolids), munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, and industrial, municipal, and agricultural waste. This term does not include sewage from vessels within the meaning of section 312 of the CWA, nor does it include dredged or fill material discharged in accordance with a permit issued under section 404 of the CWA.

Pollution means contamination or other alteration of the physical, chemical, or biological properties of waters of the State; including change in temperature, taste, color, turbidity, or odor of the waters; or such discharge of any liquid, gaseous, solid, radioactive or other substance into any *waters of the State* as will or is likely to create a nuisance or render such waters harmful, detrimental or injurious to the public health, safety or welfare; or to domestic, commercial, industrial, agricultural, recreational, or other legitimate beneficial uses; or to livestock, wild animals, birds, fish or other aquatic life.

Process Wastewater means any water which, during manufacturing or processing, comes into direct contact with or results from the production or use of any raw material, intermediate product, finished product, byproduct, or waste product. If *stormwater* commingles with process wastewater, the commingled water is considered process wastewater.

Receiving Water means the waterbody at the point of discharge. If the discharge is to a *storm sewer system*, either surface or subsurface, the receiving water is the waterbody to which the storm system discharges. Systems designed primarily for other purposes such as for ground water drainage, redirecting stream natural flows, or for conveyance of irrigation water/return flows that coincidentally convey *stormwater* are considered the receiving water.

Representative means a *stormwater* or wastewater sample which represents the flow and characteristics of the discharge. Representative samples may be a grab sample, a time-proportionate *composite sample*, or a flow proportionate sample. Ecology's Construction Stormwater Monitoring Manual provides guidance on representative sampling.

Responsible Corporate Officer for the purpose of signatory authority means: (i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures (40 CFR 122.22).

Sanitary Sewer means a sewer which is designed to convey domestic wastewater.

Sediment means the fragmented material that originates from the weathering and erosion of rocks or unconsolidated deposits, and is transported by, suspended in, or deposited by water.

Sedimentation means the depositing or formation of sediment.

Sensitive Area means a waterbody, wetland, stream, aquifer recharge area, or channel migration zone.

SEPA (State Environmental Policy Act) means the Washington State Law, RCW 43.21C.020, intended to prevent or eliminate damage to the environment.

Significant Amount means an amount of a *pollutant* in a discharge that is amenable to available and reasonable methods of prevention or treatment; or an amount of a *pollutant* that has a reasonable potential to cause a violation of surface or ground water quality or sediment management standards.

Significant Concrete Work means greater than 1000 cubic yards poured concrete used over the life of a project.

Significant Contributor of Pollutants means a facility determined by Ecology to be a contributor of a significant amount(s) of a *pollutant*(s) to waters of the State of Washington.

Site means the land or water area where any "facility or activity" is physically located or conducted.

Source Control BMPs means physical, structural or mechanical devices or facilities that are intended to prevent *pollutants* from entering *stormwater*. A few examples of source control

BMPs are erosion control practices, maintenance of stormwater facilities, constructing roofs over storage and working areas, and directing wash water and similar discharges to the *sanitary sewer* or a dead end sump.

Stabilization means the application of appropriate BMPs to prevent the erosion of soils, such as, temporary and permanent seeding, vegetative covers, mulching and matting, plastic covering and sodding. See also the definition of Erosion and Sediment Control BMPs.

Storm Drain means any drain which drains directly into a *storm sewer system*, usually found along roadways or in parking lots.

Storm Sewer System means a means a conveyance, or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, manmade channels, or storm drains designed or used for collecting or conveying *stormwater*. This does not include systems which are part of a *combined sewer* or Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.2.

Stormwater means that portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, pipes, and other features of a stormwater drainage system into a defined surface waterbody, or a constructed infiltration facility.

Stormwater Management Manual (SWMM) or **Manual** means the technical Manual published by Ecology for use by local governments that contain descriptions of and design criteria for BMPs to prevent, control, or treat *pollutants* in *stormwater*.

Stormwater Pollution Prevention Plan (SWPPP) means a documented plan to implement measures to identify, prevent, and control the contamination of point source discharges of *stormwater*.

Surface Waters of the State includes lakes, rivers, ponds, streams, inland waters, salt waters, and all other surface waters and water courses within the jurisdiction of the State of Washington.

Temporary Stabilization means the exposed ground surface has been covered with appropriate materials to provide temporary stabilization of the surface from water or wind erosion. Materials include, but are not limited to, mulch, riprap, erosion control mats or blankets and temporary cover crops. Seeding alone is not considered stabilization. Temporary stabilization is not a substitute for the more permanent "*final stabilization*."

Total Maximum Daily Load (TMDL) means a calculation of the maximum amount of a *pollutant* that a waterbody can receive and still meet state water quality standards. Percentages of the total maximum daily load are allocated to the various pollutant sources. A TMDL is the sum of the allowable loads of a single *pollutant* from all contributing point and nonpoint sources. The TMDL calculations must include a "margin of safety" to ensure that the waterbody can be protected in case there are unforeseen events or unknown sources of the *pollutant*. The calculation must also account for seasonable variation in water quality.

Transfer of Coverage (TOC) means a request for transfer of coverage under this general permit as specified by General Condition G9 of this permit.

Treatment BMPs means BMPs that are intended to remove *pollutants* from *stormwater*. A few examples of treatment BMPs are detention ponds, oil/water separators, biofiltration, and constructed wetlands.

Transparency means a measurement of water clarity in centimeters (cm), using a 60 cm transparency tube. The transparency tube is used to estimate the relative clarity or transparency of water by noting the depth at which a black and white Secchi disc becomes visible when water is released from a value in the bottom of the tube. A transparency tube is sometimes referred to as a "turbidity tube."

Turbidity means the clarity of water expressed as nephelometric turbidity units (NTUs) and measured with a calibrated turbidimeter.

Uncontaminated means free from any contaminant. See definition of "*contaminant*" and WAC 173-340-200.

Waste Load Allocation (WLA) means the portion of a receiving water's loading capacity that is allocated to one of its existing or future point sources of pollution. WLAs constitute a type of water quality based effluent limitation (40 CFR 130.2[h]).

Water-only Based Shaft Drilling is a shaft drilling process that uses water only and no additives are involved in the drilling of shafts for construction of building, road, or bridge foundations.

Water quality means the chemical, physical, and biological characteristics of water, usually with respect to its suitability for a particular purpose.

Waters of the State includes those waters as defined as "waters of the United States" in 40 CFR Subpart 122.2 within the geographic boundaries of Washington State and "waters of the State" as defined in Chapter 90.48 RCW, which include lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, and all other surface waters and water courses within the jurisdiction of the state of Washington.

Well means a bored, drilled or driven shaft, or dug hole whose depth is greater than the largest surface dimension. (See Injection well.)

Wheel Wash Wastewater means any water used in, or resulting from the operation of, a tire bath or wheel wash (BMP C106: Wheel Wash), or other structure or practice that uses water to physically remove mud and debris from vehicles leaving a construction site and prevent track-out onto roads. When *stormwater* comingles with wheel wash wastewater, the resulting water is considered wheel wash wastewater and must be managed according to Special Condition S9.D.9.

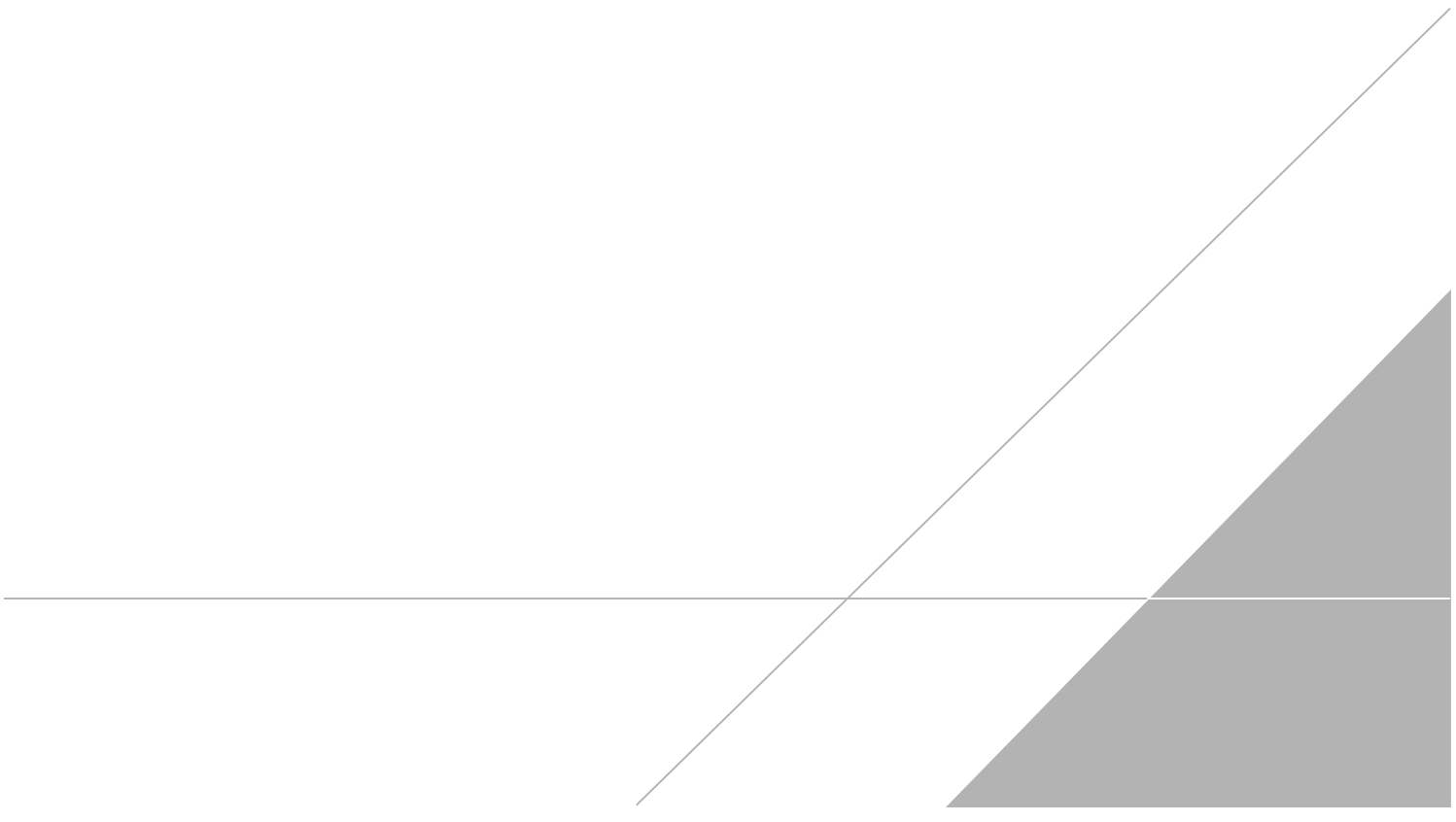
APPENDIX B – ACRONYMS

AKART	All Known, Available, and Reasonable Methods of Prevention, Control, and Treatment
BMP	Best Management Practice
CESCL	Certified Erosion and Sediment Control Lead
CFR	Code of Federal Regulations
CKD	Cement Kiln Dust
cm	Centimeters
CTB	Cement-Treated Base
CWA	Clean Water Act
DMR	Discharge Monitoring Report
EPA	Environmental Protection Agency
ERTS	Environmental Report Tracking System
ESC	Erosion and Sediment Control
FR	Federal Register
LID	Low Impact Development
NOI	Notice of Intent
NOT	Notice of Termination
NPDES	National Pollutant Discharge Elimination System
NTU	Nephelometric Turbidity Unit
RCW	Revised Code of Washington
SEPA	State Environmental Policy Act
SWMM	Stormwater Management Manual
SWPPP	Stormwater Pollution Prevention Plan
TMDL	Total Maximum Daily Load
UIC	Underground Injection Control
USC	United States Code
USEPA	United States Environmental Protection Agency
WAC	Washington Administrative Code
WQ	Water Quality
WWHM	Western Washington Hydrology Model

ATTACHMENT B

Construction Plans and Specifications

(SEE Appendix E of the Construction Plans and Specifications Summary Report)



ATTACHMENT C

2012 Stormwater Management Manual for Western Washington
Construction BMPs

BMP C101 – Preserving Natural Vegetation

Purpose

The purpose of preserving natural vegetation is to reduce erosion wherever practicable. Limiting site disturbance is the single most effective method for reducing erosion. For example, conifers can hold up to about 50 percent of all rain that falls during a storm. Up to 20-30 percent of this rain may never reach the ground but is taken up by the tree or evaporates. Another benefit is that the rain held in the tree can be released slowly to the ground after the storm.

Conditions of Use

- Natural vegetation should be preserved on steep slopes, near perennial and intermittent watercourses or swales, and on building sites in wooded areas.
- As required by local governments.

Design and Installation Specifications

Natural vegetation can be preserved in natural clumps or as individual trees, shrubs and vines.

The preservation of individual plants is more difficult because heavy equipment is generally used to remove unwanted vegetation. The points to remember when attempting to save individual plants are:

- Is the plant worth saving? Consider the location, species, size, age, vigor, and the work involved. Local governments may also have ordinances to save natural vegetation and trees.
- Fence or clearly mark areas around trees that are to be saved. It is preferable to keep ground disturbance away from the trees at least as far out as the dripline.

Plants need protection from three kinds of injuries:

- *Construction Equipment* - This injury can be above or below the ground level. Damage results from scarring, cutting of roots, and compaction of the soil. Placing a fenced buffer zone around plants to be saved prior to construction can prevent construction equipment injuries.

- *Grade Changes* - Changing the natural ground level will alter grades, which affects the plant's ability to obtain the necessary air, water, and minerals. Minor fills usually do not cause problems although sensitivity between species does vary and should be checked. Trees can tolerate fill of 6 inches or less. For shrubs and other plants, the fill should be less.

  When there are major changes in grade, it may become necessary to supply air to the roots of plants. This can be done by placing a layer of gravel and a tile system over the roots before the fill is made. A tile system protects a tree from a raised grade. The tile system should be laid out on the original grade leading from a dry well around the tree trunk. The system should then be covered with small stones to allow air to circulate over the root area.

  Lowering the natural ground level can seriously damage trees and shrubs. The highest percentage of the plant roots are in the upper 12 inches of the soil and cuts of only 2-3 inches can cause serious injury. To protect the roots it may be

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necessary to terrace the immediate area around the plants to be saved. If roots are exposed, construction of retaining walls may be needed to keep the soil in place. Plants can also be preserved by leaving them on an undisturbed, gently sloping mound. To increase the chances for survival, it is best to limit grade changes and other soil disturbances to areas outside the dripline of the plant.

- *Excavations* - Protect trees and other plants when excavating for drainfields, power, water, and sewer lines. Where possible, the trenches should be routed around trees and large shrubs. When this is not possible, it is best to tunnel under them. This can be done with hand tools or with power augers. If it is not possible to route the trench around plants to be saved, then the following should be observed:

  Cut as few roots as possible. When you have to cut, cut clean. Paint cut root ends with a wood dressing like asphalt base paint.

  Backfill the trench as soon as possible.

  Tunnel beneath root systems as close to the center of the main trunk to preserve most of the important feeder roots.

Some problems that can be encountered with a few specific trees are:

- Maple, Dogwood, Red alder, Western hemlock, Western red cedar, and Douglas fir do not readily adjust to changes in environment and special care should be taken to protect these trees.
- The windthrow hazard of Pacific silver fir and madronna is high, while that of Western hemlock is moderate. The danger of windthrow increases where dense stands have been thinned. Other species (unless they are on shallow, wet soils less than 20 inches deep) have a low windthrow hazard.
- Cottonwoods, maples, and willows have water-seeking roots. These can cause trouble in sewer lines and infiltration fields. On the other hand, they thrive in high moisture conditions that other trees would not.
- Thinning operations in pure or mixed stands of Grand fir, Pacific silver fir, Noble fir, Sitka spruce, Western red cedar, Western hemlock, Pacific dogwood, and Red alder can cause serious disease problems. Disease can become established through damaged limbs, trunks, roots, and freshly cut stumps. Diseased and weakened trees are also susceptible to insect attack.

Maintenance Standards

- Inspect flagged and/or fenced areas regularly to make sure flagging or fencing has not been removed or damaged. If the flagging or fencing has been damaged or visibility reduced, it shall be repaired or replaced immediately and visibility restored.
- If tree roots have been exposed or injured, “prune” cleanly with an appropriate pruning saw or lopers directly above the damaged roots and recover with native soils. Treatment of sap flowing trees (fir, hemlock, pine, soft maples) is not advised as sap forms a natural healing barrier.

BMP C102 – Buffer Zones

Purpose
An undisturbed area or strip of natural vegetation or an established suitable planting that will provide a living filter to reduce soil erosion and runoff velocities.

Conditions of Use
Natural buffer zones are used along streams, wetlands and other bodies of water that need protection from erosion and sedimentation. Vegetative buffer zones can be used to protect natural swales and can be incorporated into the natural landscaping of an area.

Critical-areas buffer zones should not be used as sediment treatment areas. These areas shall remain completely undisturbed. The local permitting authority may expand the buffer widths temporarily to allow the use of the expanded area for removal of sediment.

Design and Installation Specifications
- Preserving natural vegetation or plantings in clumps, blocks, or strips is generally the easiest and most successful method.
- Leave all unstable steep slopes in natural vegetation.
- Mark clearing limits and keep all equipment and construction debris out of the natural areas. Steel construction fencing is the most effective method in protecting sensitive areas and buffers. Alternatively, wire-backed silt fence on steel posts is marginally effective. Flagging alone is typically not effective.
- Keep all excavations outside the dripline of trees and shrubs.
- Do not push debris or extra soil into the buffer zone area because it will cause damage from burying and smothering.
- Vegetative buffer zones for streams, lakes or other waterways shall be established by the local permitting authority or other state or federal permits or approvals.

Maintenance Standards
- Inspect the area frequently to make sure flagging remains in place and the area remains undisturbed.

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BMP C105: Stabilized Construction Entrance

Purpose

Construction entrances are stabilized to reduce the amount of sediment transported onto paved roads by vehicles or equipment by constructing a stabilized pad of quarry spalls at entrances to construction sites.

Conditions of Use

Construction entrances shall be stabilized wherever traffic will be leaving a construction site and traveling on paved roads or other paved areas within 1,000 feet of the site.

On large commercial, highway, and road projects, the designer should include enough extra materials in the contract to allow for additional stabilized entrances not shown in the initial Construction SWPPP. It is difficult to determine exactly where access to these projects will take place; additional materials will enable the contractor to install them where needed.

Design and Installation Specifications

- See Figure 4.2 for details. Note: the 100' minimum length of the entrance shall be reduced to the maximum practicable size when the size or configuration of the site does not allow the full length (100').
- A separation geotextile shall be placed under the spalls to prevent fine sediment from pumping up into the rock pad. The geotextile shall meet the following standards:

Grab Tensile Strength (ASTM D4751)	200 psi min.
Grab Tensile Elongation (ASTM D4632)	30% max.
Mullen Burst Strength (ASTM D3786-80a)	400 psi min.
AOS (ASTM D4751)	20-45 (U.S. standard sieve size)

- Consider early installation of the first lift of asphalt in areas that will paved; this can be used as a stabilized entrance. Also consider the installation of excess concrete as a stabilized entrance. During large concrete pours, excess concrete is often available for this purpose.
- Hog fuel (wood-based mulch) may be substituted for or combined with quarry spalls in areas that will not be used for permanent roads. Hog fuel is generally less effective at stabilizing construction entrances and should be used only at sites where the amount of traffic is very limited. Hog fuel is not recommended for entrance stabilization in urban areas. The effectiveness of hog fuel is highly variable and it generally requires more maintenance than quarry spalls. The inspector may at any time require the use of quarry spalls if the hog fuel is not preventing sediment from being tracked onto pavement or if the hog fuel is being carried onto pavement. Hog fuel is prohibited in permanent roadbeds because organics in the subgrade soils cause degradation of the subgrade support over time.
- Fencing (see BMPs C103 and C104) shall be installed as necessary to restrict traffic to the construction entrance.

- Whenever possible, the entrance shall be constructed on a firm, compacted subgrade. This can substantially increase the effectiveness of the pad and reduce the need for maintenance.

Maintenance Standards

- Quarry spalls (or hog fuel) shall be added if the pad is no longer in accordance with the specifications.
- If the entrance is not preventing sediment from being tracked onto pavement, then alternative measures to keep the streets free of sediment shall be used. This may include street sweeping, an increase in the dimensions of the entrance, or the installation of a wheel wash.
- Any sediment that is tracked onto pavement shall be removed by shoveling or street sweeping. The sediment collected by sweeping shall be removed or stabilized on site. The pavement shall not be cleaned by washing down the street, except when sweeping is ineffective and there is a threat to public safety. If it is necessary to wash the streets, the construction of a small sump shall be considered. The sediment would then be washed into the sump where it can be controlled.
- Any quarry spalls that are loosened from the pad, which end up on the roadway shall be removed immediately.
- If vehicles are entering or exiting the site at points other than the construction entrance(s), fencing (see BMPs C103 and C104) shall be installed to control traffic.
- Upon project completion and site stabilization, all construction accesses intended as permanent access for maintenance shall be permanently stabilized.

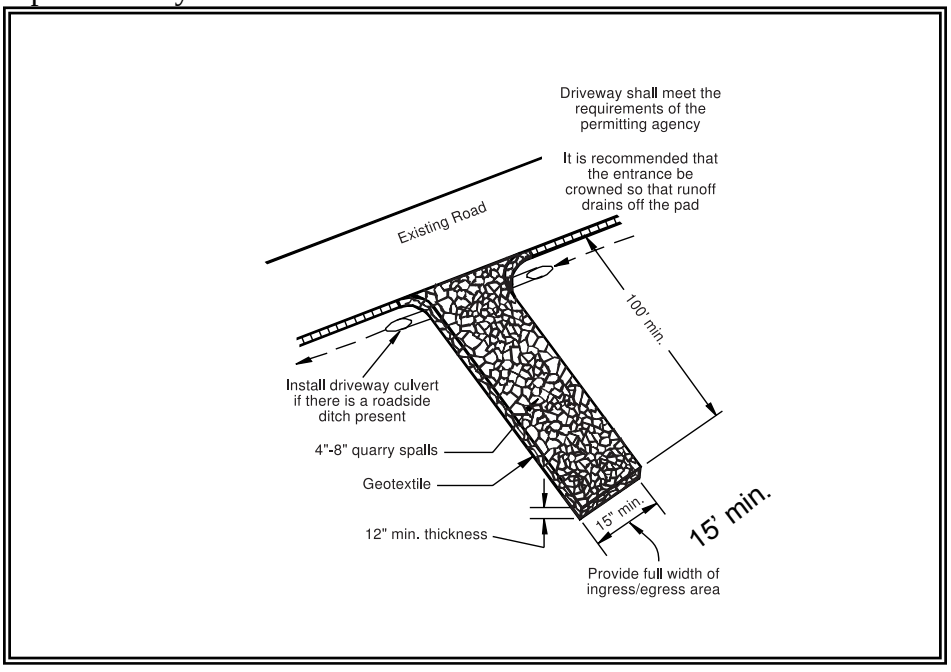

Figure 4.2 – Stabilized Construction Entrance

BMP C120 – Temporary and Permanent Seeding

Purpose

Seeding is intended to reduce erosion by stabilizing exposed soils. A well-established vegetative cover is one of the most effective methods of reducing erosion.

Conditions of Use

- Seeding may be used throughout the project on disturbed areas that have reached final grade or that will remain unworked for more than 30 days.
- Channels that will be vegetated should be installed before major earthwork and hydroseeded with a Bonded Fiber Matrix. The vegetation should be well established (i.e., 75 percent cover) before water is allowed to flow in the ditch. With channels that will have high flows, erosion control blankets should be installed over the hydroseed. If vegetation cannot be established from seed before water is allowed in the ditch, sod should be installed in the bottom of the ditch over hydromulch and blankets.
- Retention/detention ponds should be seeded as required.
- Mulch is required at all times because it protects seeds from heat, moisture loss, and transport due to runoff.
- All disturbed areas shall be reviewed in late August to early September and all seeding should be completed by the end of September. Otherwise, vegetation will not establish itself enough to provide more than average protection.
- At final site stabilization, all disturbed areas not otherwise vegetated or stabilized shall be seeded and mulched. Final stabilization means the completion of all soil disturbing activities at the site and the establishment of a permanent vegetative cover, or equivalent permanent stabilization measures (such as pavement, riprap, gabions or geotextiles) which will prevent erosion.

Design and Installation Specifications

- Seeding should be done during those seasons most conducive to growth and will vary with the climate conditions of the region. Local experience should be used to determine the appropriate seeding periods.
- The optimum seeding windows for western Washington are April 1 through June 30 and September 1 through October 1. Seeding that occurs between July 1 and August 30 will require irrigation until 75 percent grass cover is established. Seeding that occurs between October 1 and March 30 will require a mulch or plastic cover until 75 percent grass cover is established.
- To prevent seed from being washed away, confirm that all required surface water control measures have been installed.
- The seedbed should be firm and rough. All soil should be roughened no matter what the slope. If compaction is required for engineering purposes, slopes must be track walked before seeding. Backblading or smoothing of slopes greater than 4:1 is not allowed if they are to be seeded.
- New and more effective restoration-based landscape practices rely on deeper incorporation than that provided by a simple single-pass rototilling treatment. Wherever practical the subgrade should be initially ripped to improve long-term permeability, infiltration, and water

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inflow qualities. At a minimum, permanent areas shall use soil amendments to achieve organic matter and permeability performance defined in engineered soil/landscape systems. For systems that are deeper than 8 inches the rototilling process should be done in multiple lifts, or the prepared soil system shall be prepared properly and then placed to achieve the specified depth.

- Organic matter is the most appropriate form of "fertilizer" because it provides nutrients (including nitrogen, phosphorus, and potassium) in the least water-soluble form. A natural system typically releases 2-10 percent of its nutrients annually. Chemical fertilizers have since been formulated to simulate what organic matter does naturally.
- In general, 10-4-6 N-P-K (nitrogen-phosphorus-potassium) fertilizer can be used at a rate of 90 pounds per acre. Slow-release fertilizers should always be used because they are more efficient and have fewer environmental impacts. It is recommended that areas being seeded for final landscaping conduct soil tests to determine the exact type and quantity of fertilizer needed. This will prevent the over-application of fertilizer. Fertilizer should not be added to the hydromulch machine and agitated more than 20 minutes before it is to be used. If agitated too much, the slow-release coating is destroyed.
- There are numerous products available on the market that take the place of chemical fertilizers. These include several with seaweed extracts that are beneficial to soil microbes and organisms. If 100 percent cottonseed meal is used as the mulch in hydroseed, chemical fertilizer may not be necessary. Cottonseed meal is a good source of long-term, slow-release, available nitrogen.
- Hydroseed applications shall include a minimum of 1,500 pounds per acre of mulch with 3 percent tackifier. Mulch may be made up of 100 percent: cottonseed meal; fibers made of wood, recycled cellulose, hemp, and kenaf; compost; or blends of these. Tackifier shall be plantbased, such as guar or alpha plantago, or chemical-based such as polyacrylamide or polymers. Any mulch or tackifier product used shall be installed per manufacturer's instructions. Generally, mulches come in 40-50 pound bags. Seed and fertilizer are added at time of application.
- Mulch is always required for seeding. Mulch can be applied on top of the seed or simultaneously by hydroseeding.
- On steep slopes, Bonded Fiber Matrix (BFM) or Mechanically Bonded Fiber Matrix (MBFM) products should be used. BFM/MBFM products are applied at a minimum rate of 3,000 pounds per acre of mulch with approximately 10 percent tackifier. Application is made so that a minimum of 95 percent soil coverage is achieved. Numerous products are available commercially and should be installed per manufacturer's instructions. Most products require 24-36 hours to cure before a rainfall and cannot be installed on wet or saturated soils. Generally, these products come in 40-50 pound bags and include all necessary ingredients except for seed and fertilizer.

BFMs and MBFMs have some advantages over blankets:

- No surface preparation required;
- Can be installed via helicopter in remote areas;
- On slopes steeper than 2.5:1, blanket installers may need to be roped and harnessed for safety;
- They are at least $1,000 per acre cheaper installed.

In most cases, the shear strength of blankets is not a factor when used on slopes, only when used in channels. BFMs and MBFMs are good alternatives to

blankets in most situations where vegetation establishment is the goal.

- When installing seed via hydroseeding operations, only about 1/3 of the seed actually ends up in contact with the soil surface. This reduces the ability to establish a good stand of grass quickly. One way to overcome this is to increase seed quantities by up to 50 percent.
- Vegetation establishment can also be enhanced by dividing the hydromulch operation into two phases:
    1. Phase 1- Install all seed and fertilizer with 25-30 percent mulch and tackifier onto soil in the first lift;
    2. Phase 2- Install the rest of the mulch and tackifier over the first lift.

An alternative is to install the mulch, seed, fertilizer, and tackifier in one lift. Then, spread or blow straw over the top of the hydromulch at a rate of about 800-1000 pounds per acre. Hold straw in place with a standard tackifier. Both of these approaches will increase cost moderately but will greatly improve and enhance vegetative establishment. The increased cost may be offset by the reduced need for:

1. Irrigation
2. Reapplication of mulch
3. Repair of failed slope surfaces

This technique works with standard hydromulch (1,500 pounds per acre minimum) and BFM/MBFMs (3,000 pounds per acre minimum).

- Areas to be permanently landscaped shall provide a healthy topsoil that reduces the need for fertilizers, improves overall topsoil quality, provides for better vegetal health and vitality, improves hydrologic characteristics, and reduces the need for irrigation. This can be accomplished in a number of ways:
  Recent research has shown that the best method to improve till soils is to amend these soils with compost. The optimum mixture is approximately two parts soil to one part compost. This equates to 4 inches of compost mixed to a depth of 12 inches in till soils. Increasing the concentration of compost beyond this level can have negative effects on vegetal health, while decreasing the concentrations can reduce the benefits of amended soils. Please note: The compost should meet specifications for Grade A quality compost in Ecology Publication 94-038.

  Other soils, such as gravel or cobble outwash soils, may require different approaches. Organics and fines easily migrate through the loose structure of these soils. Therefore, the importation of at least 6 inches of quality topsoil, underlain by some type of filter fabric to prevent the migration of fines, may be more appropriate for these soils.

  Areas that already have good topsoil, such as undisturbed areas, do not require soil amendments.

- Areas that will be seeded only and not landscaped may need compost or meal-based mulch included in the hydroseed in order to establish vegetation. Native topsoil should be re-installed on the disturbed soil surface before application.
- Seed that is installed as a temporary measure may be installed by hand if it will be covered by straw, mulch, or topsoil. Seed that is installed as a permanent measure may be installed by hand on small areas (usually less than 1 acre) that will be covered with mulch, topsoil, or erosion blankets. The seed mixes listed below include recommended mixes for both temporary and permanent seeding. These mixes, with the exception of the wetland mix, shall be applied at a rate of 120 pounds per acre. This rate can be reduced if soil amendments or slowrelease fertilizers are used. Local suppliers or the local conservation district should be consulted for their recommendations

because the appropriate mix depends on a variety of factors, including location, exposure, soil type, slope, and expected foot traffic. Alternative seed mixes approved by the local authority may be used.

Table 4.1 represents the standard mix for those areas where just a temporary vegetative cover is required.

Table 4.1 Temporary Erosion Control Seed Mix			
	% Weight	**% Purity**	**% Germination**
Chewings or annual blue grass *Festuca rubra var. commutata* or *Poa anna*	40	98	90
Perennial rye - *Lolium perenne*	50	98	90
Redtop or colonial bentgrass *Agrostis alba* or *Agrostis tenuis*	5	92	85
White dutch clover *Trifolium repens*	5	98	90

Table 4.2 provides just one recommended possibility for landscaping seed.

Table 4.2 Landscaping Seed Mix			
	% Weight	**% Purity**	**% Germination**
Perennial rye blend *Lolium perenne*	70	98	90
Chewings and red fescue blend *Festuca rubra var. commutata* or *Festuca rubra*	30	98	90

This turf seed mix in Table 4.3 is for dry situations where there is no need for much water. The advantage is that this mix requires very little maintenance.

Table 4.3 Low-Growing Turf Seed Mix			
	% Weight	**% Purity**	**% Germination**
Dwarf tall fescue (several varieties) *Festuca arundinacea var.*	45	98	90
Dwarf perennial rye (Barclay) *Lolium perenne var. barclay*	30	98	90
Red fescue *Festuca rubra*	20	98	90
Colonial bentgrass *Agrostis tenuis*	5	98	90

Table 4.4 presents a mix recommended for bioswales and other intermittently wet areas.

Table 4.4 Bioswale Seed Mix*			
	% Weight	**% Purity**	**% Germination**
Tall or meadow fescue *Festuca arundinacea* or *Festuca elatior*	75-80	98	90
Seaside/Creeping bentgrass *Agrostis palustris*	10-15	92	85
Redtop bentgrass *Agrostis alba* or *Agrostis gigantea*	5-10	90	80

Modified Briargreen, Inc. Hydroseeding Guide Wetlands Seed Mix

The seed mix shown in Table 4.5 is a recommended low-growing, relatively non-invasive seed mix appropriate for very wet areas that are not regulated wetlands. Other mixes may be appropriate, depending on the soil type and hydrology of the area. Recent research suggests that bentgrass (agrostis sp.) should be emphasized in wet-area seed mixes. Apply this mixture at a rate of 60 pounds per acre.

Table 4.5 Wet Area Seed Mix*

	% Weight	% Purity	% Germination
Tall or meadow fescue *Festuca arundinacea* or *Festuca elatior*	60-70	98	90
Seaside/Creeping bentgrass *Agrostis palustris*	10-15	98	85
Meadow foxtail *Alepocurus pratensis*	10-15	90	80
Alsike clover *Trifolium hybridum*	1-6	98	90
Redtop bentgrass *Agrostis alba*	1-6	92	85

** Modified Briargreen, Inc. Hydroseeding Guide Wetlands Seed Mix*

The meadow seed mix in Table 4.6 is recommended for areas that will be maintained infrequently or not at all and where colonization by native plants is desirable. Likely applications include rural road and utility right-of-way. Seeding should take place in September or very early October in order to obtain adequate establishment prior to the winter months. The appropriateness of clover in the mix may need to be considered, as this can be a fairly invasive species. If the soil is amended, the addition of clover may not be necessary.

Table 4.6 Meadow Seed Mix

	% Weight	% Purity	% Germination
Redtop or Oregon bentgrass *Agrostis alba* or *Agrostis oregonensis*	20	92	85
Red fescue *Festuca rubra*	70	98	90
White dutch clover *Trifolium repens*	10	98	90

Maintenance Standards

- Any seeded areas that fail to establish at least 80 percent cover (100 percent cover for areas that receive sheet or concentrated flows) shall be reseeded. If reseeding is ineffective, an alternate method, such as sodding, mulching, or nets/blankets, shall be used. If winter weather prevents adequate grass growth, this time limit may be relaxed at the discretion of the local authority when sensitive areas would otherwise be protected.
- After adequate cover is achieved, any areas that experience erosion shall be reseeded and protected by mulch. If the erosion problem is drainage related, the problem shall be fixed and the eroded area reseeded and protected by mulch.
- Seeded areas shall be supplied with adequate moisture, but not watered to the extent that it causes runoff.

BMP C123 – Plastic Covering

Purpose

Plastic covering provides immediate, short-term erosion protection to slopes and disturbed areas.

Conditions of Use

- Plastic covering may be used on disturbed areas that require cover measures for less than 30 days, except as stated below.
- Plastic is particularly useful for protecting cut and fill slopes and stockpiles. Note: The relatively rapid breakdown of most polyethylene sheeting makes it unsuitable for long-term (greater than six months) applications.
- Clear plastic sheeting can be used over newly-seeded areas to create a greenhouse effect and encourage grass growth if the hydroseed was installed too late in the season to establish 75 percent grass cover, or if the wet season started earlier than normal. Clear plastic should not be used for this purpose during the summer months because the resulting high temperatures can kill the grass.
- Due to rapid runoff caused by plastic sheeting, this method shall not be used upslope of areas that might be adversely impacted by concentrated runoff. Such areas include steep and/or unstable slopes.
- While plastic is inexpensive to purchase, the added cost of installation, maintenance, removal, and disposal make this an expensive material, up to $1.50-2.00 per square yard.
- Whenever plastic is used to protect slopes, water collection measures must be installed at the base of the slope. These measures include plastic-covered berms, channels, and pipes used to covey clean rainwater away from bare soil and disturbed areas. At no time is clean runoff from a plastic covered slope to be mixed with dirty runoff from a project.
- Other uses for plastic include:
  1. Temporary ditch liner;
  2. Pond liner in temporary sediment pond;
  3. Liner for bermed temporary fuel storage area if plastic is not reactive to the type of fuel being stored;
  4. Emergency slope protection during heavy rains; and,
  5. Temporary drainpipe (“elephant trunk”) used to direct water.

Design and Installation Specifications

- Plastic slope cover must be installed as follows:
  1. Run plastic up and down slope, not across slope;
  2. Plastic may be installed perpendicular to a slope if the slope length is less than 10 feet;
  3. Minimum of 8-inch overlap at seams;
  4. On long or wide slopes, or slopes subject to wind, all seams should be taped;
  5. Place plastic into a small (12-inch wide by 6-inch deep) slot trench at the top of the slope and backfill with soil to keep water from flowing underneath;
  6. Place sand filled burlap or geotextile bags every 3 to 6 feet along seams

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and pound a wooden stake through each to hold them in place;

7. Inspect plastic for rips, tears, and open seams regularly and repair immediately. This prevents high velocity runoff from contacting bare soil which causes extreme erosion;
8. Sandbags may be lowered into place tied to ropes. However, all sandbags must be staked in place.

- Plastic sheeting shall have a minimum thickness of 0.06 millimeters.
- If erosion at the toe of a slope is likely, a gravel berm, riprap, or other suitable protection shall be installed at the toe of the slope in order to reduce the velocity of runoff.

Maintenance Standards

- Torn sheets must be replaced and open seams repaired.
- If the plastic begins to deteriorate due to ultraviolet radiation, it must be completely removed and replaced.
- When the plastic is no longer needed, it shall be completely removed.
- Dispose of old tires appropriately.

BMP C103: High Visibility Plastic or Metal Fence

Purpose

Fencing is intended to: (1) restrict clearing to approved limits; (2) prevent disturbance of sensitive areas, their buffers, and other areas required to be left undisturbed; (3) limit construction traffic to designated construction entrances or roads; and, (4) protect areas where marking with survey tape may not provide adequate protection.

Conditions of Use

To establish clearing limits, plastic or metal fence may be used:

- At the boundary of sensitive areas, their buffers, and other areas required to be left uncleared.
- As necessary to control vehicle access to and on the site.

Design and Installation Specifications

- High visibility plastic fence shall be composed of a high-density polyethylene material and shall be at least four feet in height. Posts for the fencing shall be steel or wood and placed every 6 feet on center (maximum) or as needed to ensure rigidity. The fencing shall be fastened to the post every six inches with a polyethylene tie. On long continuous lengths of fencing, a tension wire or rope shall be used as a top stringer to prevent sagging between posts. The fence color shall be high visibility orange. The fence tensile strength shall be 360 lbs./ft. using the ASTM D4595 testing method.
- Metal fences shall be designed and installed according to the manufacturer's specifications.
- Metal fences shall be at least 3 feet high and must be highly visible.
- Fences shall not be wired or stapled to trees.

Maintenance Standards

- If the fence has been damaged or visibility reduced, it shall be repaired or replaced immediately and visibility restored.

BMP C130: Surface Roughening

Purpose

Surface roughening aids in the establishment of vegetative cover, reduces runoff velocity, increases infiltration, and provides for sediment trapping through the provision of a rough soil surface. Horizontal depressions are created by operating a tiller or other suitable equipment on the contour or by leaving slopes in a roughened condition by not fine grading them.

Conditions for Use

- All slopes steeper than 3:1 and greater than 5 vertical feet require surface roughening.
- Areas with grades steeper than 3:1 should be roughened to a depth of 2 to 4 inches prior to seeding.
- Areas that will not be stabilized immediately may be roughened to reduce runoff velocity until seeding takes place.
- Slopes with a stable rock face do not require roughening.
- Slopes where mowing is planned should not be excessively roughened.

Design and Installation Specifications

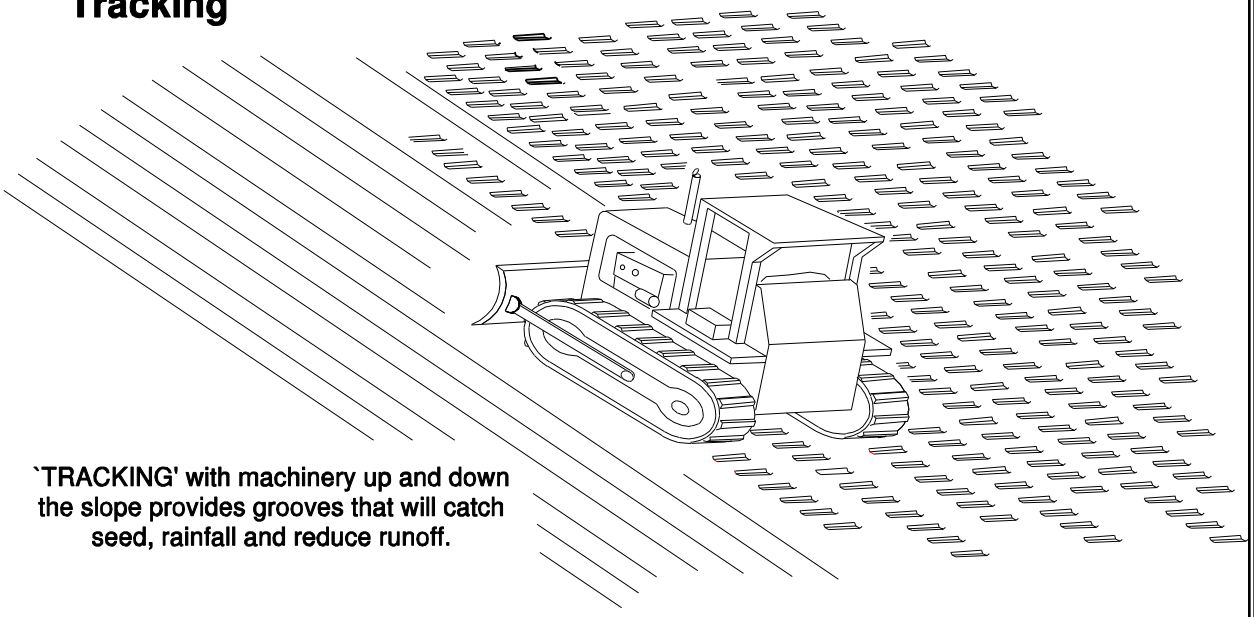
There are different methods for achieving a roughened soil surface on a slope, and the selection of an appropriate method depends upon the type of slope. Roughening methods include stair-step grading, grooving, contour furrows, and tracking. See Figure 4.6 for tracking and contour furrows. Factors to be considered in choosing a method are slope steepness, mowing requirements, and whether the slope is formed by cutting or filling.

- Disturbed areas that will not require mowing may be stair-step graded, grooved, or left rough after filling.
- Stair-step grading is particularly appropriate in soils containing large amounts of soft rock. Each "step" catches material that sloughs from above, and provides a level site where vegetation can become established. Stairs should be wide enough to work with standard earth moving equipment. Stair steps must be on contour or gullies will form on the slope.
- Areas that will be mowed (these areas should have slopes less steep than 3:1) may have small furrows left by disking, harrowing, raking, or seed-planting machinery operated on the contour.
- Graded areas with slopes greater than 3:1 but less than 2:1 should be roughened before seeding. This can be accomplished in a variety of ways, including "track walking," or driving a crawler tractor up and down the slope, leaving a pattern of cleat imprints parallel to slope contours.
- Tracking is done by operating equipment up and down the slope to leave horizontal depressions in the soil.

Maintenance Standards

- Areas that are graded in this manner should be seeded as quickly as possible.
- Regular inspections should be made of the area. If rills appear, they should be re-graded and re-seeded immediately.

Tracking



`TRACKING' with machinery up and down the slope provides grooves that will catch seed, rainfall and reduce runoff.

Contour Furrows

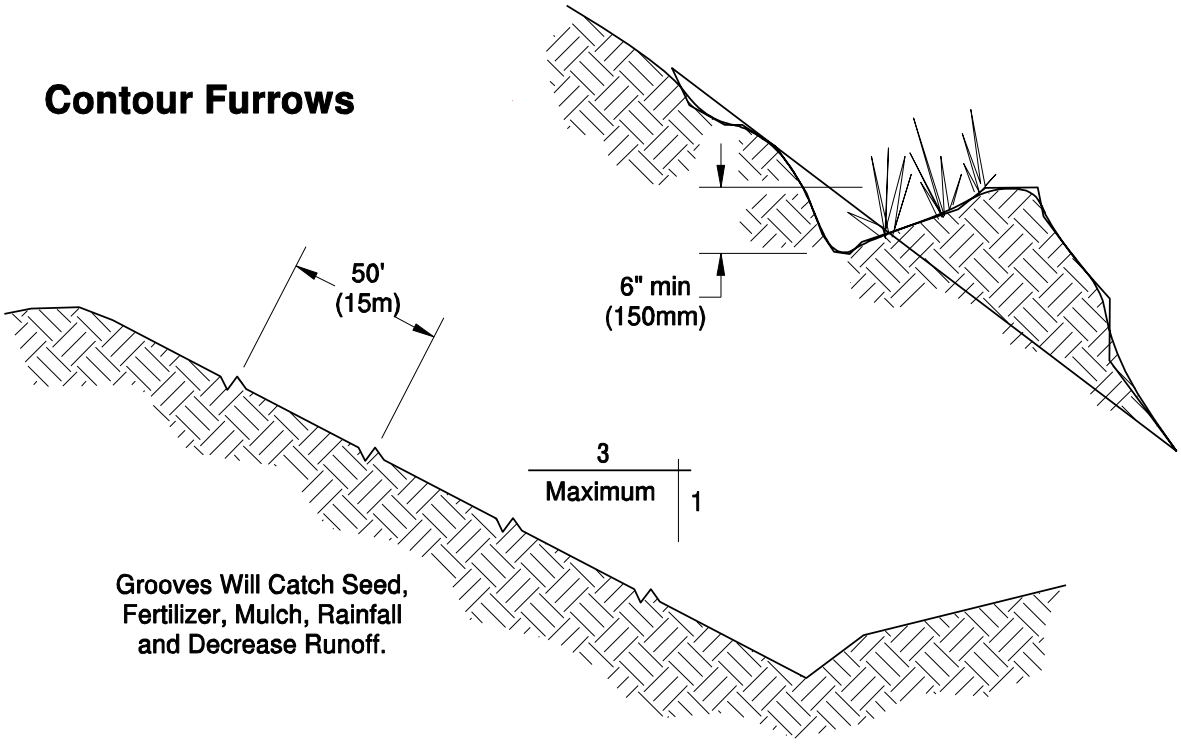


Figure 4.6 – Surface Roughening by Tracking and Contour Furrows

BMP C162: Scheduling

Purpose

Sequencing a construction project reduces the amount and duration of soil exposed to erosion by wind, rain, runoff, and vehicle tracking.

Conditions of Use

The construction sequence schedule is an orderly listing of all major land-disturbing activities together with the necessary erosion and sedimentation control measures planned for the project. This type of schedule guides the contractor on work to be done before other work is started so that serious erosion and sedimentation problems can be avoided.

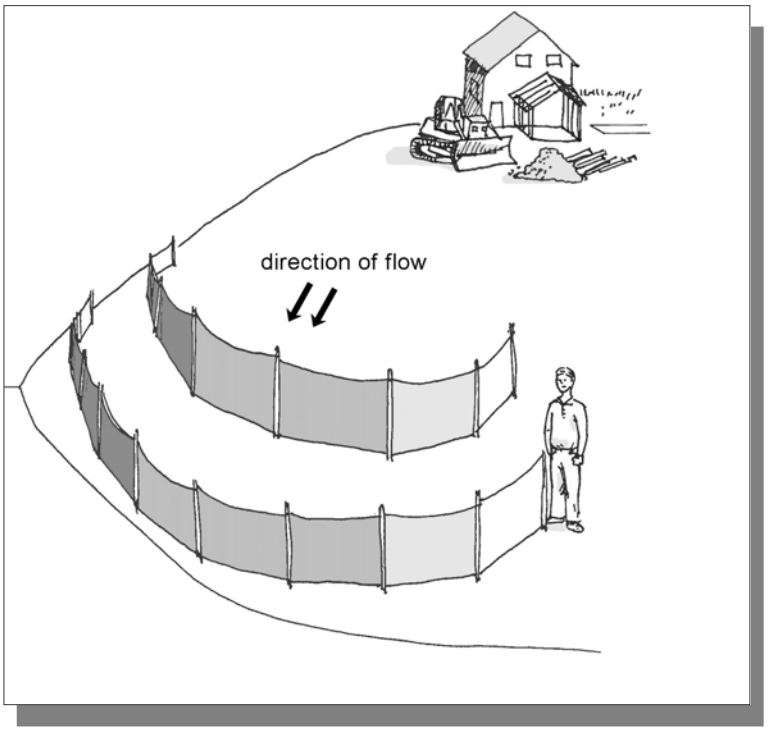
Following a specified work schedule that coordinates the timing of land-disturbing activities and the installation of control measures is perhaps the most cost-effective way of controlling erosion during construction. The removal of surface ground cover leaves a site vulnerable to accelerated erosion. Construction procedures that limit land clearing, provide timely installation of erosion and sedimentation controls, and restore protective cover quickly can significantly reduce the erosion potential of a site.

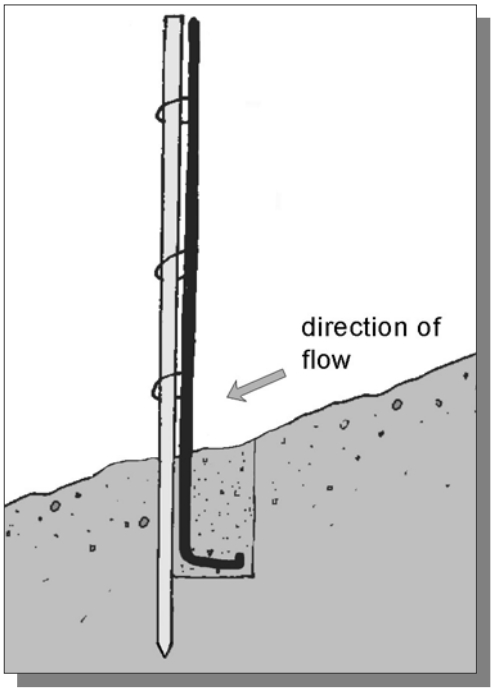
Design Considerations

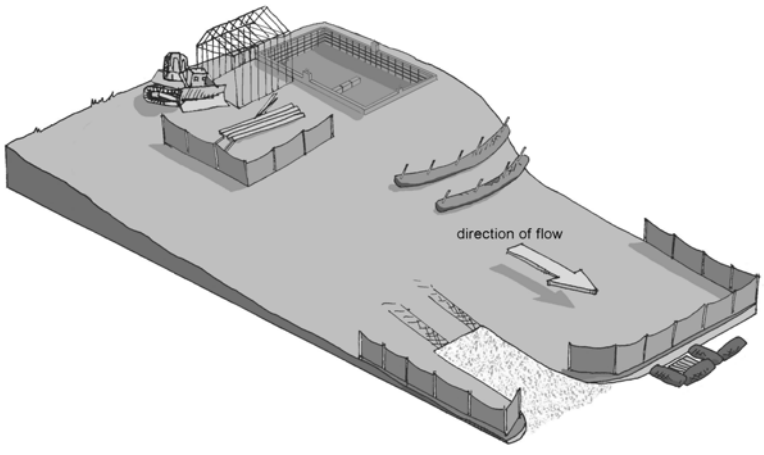
- Avoid rainy periods.
- Schedule projects to disturb only small portions of the site at any one time. Complete grading as soon as possible. Immediately stabilize the disturbed portion before grading the next portion. Practice staged seeding in order to revegetate cut and fill slopes as the work progresses.

BMP C233 – Silt Fence

Silt fencing prevents mud from flowing off the job site and into streams and rivers.







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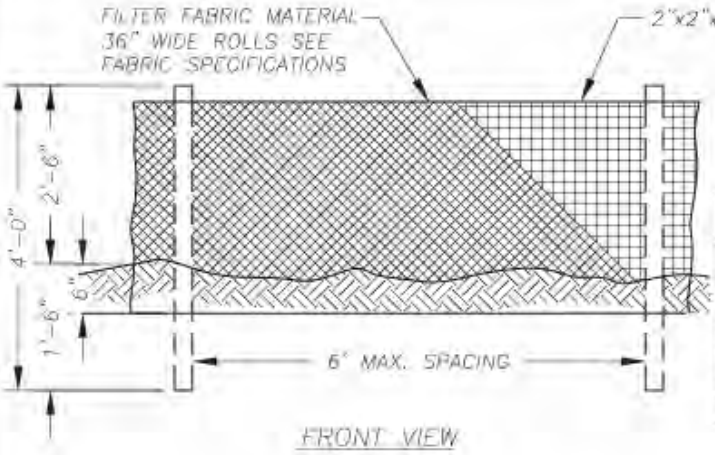
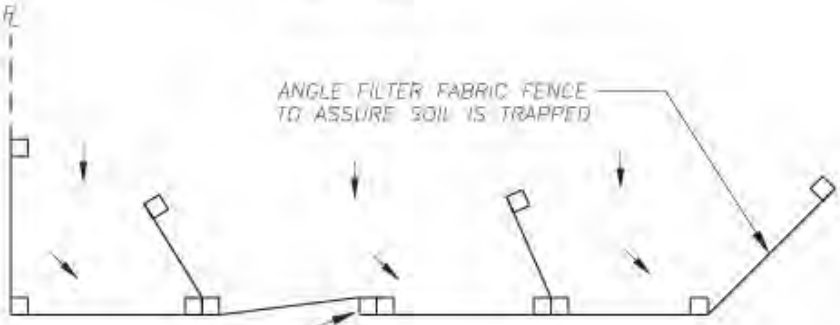


FRONT VIEW

SILT FENCE FABRIC SPECIFICATIONS
(WOVEN POLYPROYLENE SILT FENCE FABRIC)

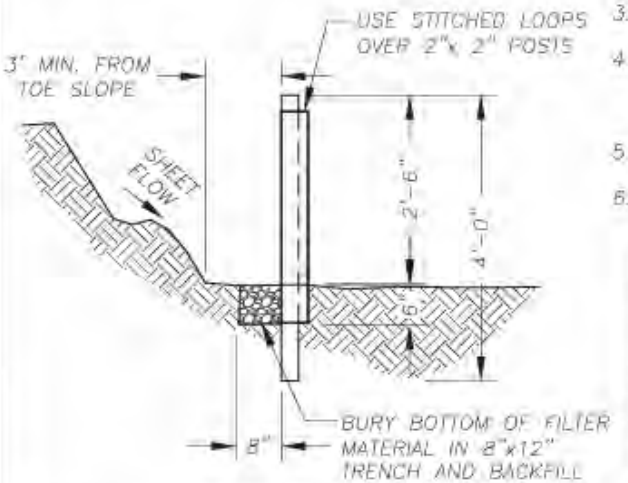
PROPERTY	TEST PROCEDURE	MIN. FABRIC VALUE
GRAB TENSILE STRENGTH	ASTM D-4632	180 LBS.
GRAB ELONGATION	ASTM D-4632	30%
TRAPEZOID TEAR	ASTM D-4533	70 LBS.
MULLEN BURST	ASTM D-3786	300 PSI
PUNCTURE	ASTM D-4833	80 LBS.
PERMITTIVIRY	ASTM D-4491	0.07 SEC-1 MIN.
PERMEABILITY	ASTM D-4491	.005 CM/SEC
A.O.S.	ASTM D-4751	50 U.S. SIEVE
UV RESISTANCE(500 HRS)	ASTM D-4355	70%



PLAN VIEW

NOTES:

1. THIS SEDIMENT BARRIER UTILIZES STANDARD STRENGTH OR EXTRA STRENGTH SYNTHETIC FILTER FABRICS, IT IS DESIGNED FOR SITUATIONS IN WHICH ONLY SHEET OR OVERLAND FLOWS ARE EXPECTED, (SEE FABRIC SPECIFICATIONS ABOVE).
2. BURY BOTTOM OF FILTER FABRIC 6" VERTICALLY BELOW FINISHED GRADE.
3. POST ARE TO BE 2"x2" FIR, PINE OR STEEL FENCE POSTS
4. POST TO BE INSTALLED ON UPHILL SIDE OF SLOPE FOR FENCING WITH STITCHED LOOP. FOR STAPLED FENCING, POST TO BE INSTALLED ON DOWNHILL SLOPE
5. COMPACT BOTH SIDES OF FILTER FABRIC TRENCH.
6. SEDIMENT FENCE TO BE SPACED ON SLOPES PER TABLE BELOW.



PROFILE

INSTALL PARALLEL ALONG CONTOURS AS FOLLOWS		
% SLOPE	SLOPE	MAX. SPACING ON SLOPE
10% FLATTER	10:1 OR FLATTER	300 ft.
10>%<15	10:1>x<7.5:1	150 ft.
15>%<20	7.5:1>x<5:1	100 ft.
20>%<30	5:1>x<3.5:1	50 ft.
30>%<50	3.5:1>x<2:1	25 ft.

NO.	REVISIONS	DATE	BY

DWG: E4.DWG

Department of Public Works
CLARK COUNTY
WASHINGTON
proud past, promising future

SILT FENCE

APPROVED
COUNTY ENGINEER
5/23/08
DATE

STANDARD
E4
DETAIL
DESIGNED
DRAWN
DATE 05/23/08

ATTACHMENT D

Inspection Forms

Inspection Reports

Corrective Action Reports

SWPPP Amendment Log

Construction Stormwater Site Inspection Form

Project Name _____ Permit # _____ Inspection Date _____ Time _____

Name of Certified Erosion Sediment Control Lead (CESCL) or qualified inspector if *less than one acre*
Print Name: _____

Approximate rainfall amount since the last inspection (in inches): _____

Approximate rainfall amount in the last 24 hours (in inches): _____

Current Weather Clear ☐ Cloudy ☐ Mist ☐ Rain ☐ Wind ☐ Fog ☐

A. Type of inspection: Weekly ☐ Post Storm Event ☐ Other ☐

B. Phase of Active Construction (*check all that apply*):

Pre Construction/installation of erosion/sediment controls	☐	Clearing/Demo/Grading	☐	Infrastructure/storm/roads	☐
Concrete pours	☐	Vertical Construction/buildings	☐	Utilities	☐
Offsite improvements	☐	Site temporary stabilized	☐	Final stabilization	☐

C. Questions:

1. Were all areas of construction and discharge points inspected? Yes ___ No ___
2. Did you observe the presence of suspended sediment, turbidity, discoloration, or oil sheen Yes ___ No ___
3. Was a water quality sample taken during inspection? (*refer to permit conditions S4 & S5*) Yes ___ No ___
4. Was there a turbid discharge 250 NTU or greater, or Transparency 6 cm or less?* Yes ___ No ___
5. If yes to #4 was it reported to Ecology? Yes ___ No ___
6. Is pH sampling required? pH range required is 6.5 to 8.5. Yes ___ No ___

If answering yes to a discharge, describe the event. Include when, where, and why it happened; what action was taken, and when.

_____

_____

_____

_____

*If answering yes to # 4 record NTU/Transparency with continual sampling daily until turbidity is 25 NTU or less/ transparency is 33 cm or greater.

Sampling Results: Date: _____

Parameter	Method (circle one)	Result			Other/Note
		NTU	cm	pH	
Turbidity	tube, meter, laboratory				
pH	Paper, kit, meter				

Construction Stormwater Site Inspection Form

D. Check the observed status of all items. Provide "Action Required "details and dates.

Element #	Inspection	BMPs Inspected			BMP needs maintenance	BMP failed	Action required (describe in section F)
		yes	no	n/a			
1 Clearing Limits	Before beginning land disturbing activities are all clearing limits, natural resource areas (streams, wetlands, buffers, trees) protected with barriers or similar BMPs? (high visibility recommended)						
2 Construction Access	Construction access is stabilized with quarry spalls or equivalent BMP to prevent sediment from being tracked onto roads?						
	Sediment tracked onto the road way was cleaned thoroughly at the end of the day or more frequent as necessary.						
3 Control Flow Rates	Are flow control measures installed to control stormwater volumes and velocity during construction and do they protect downstream properties and waterways from erosion?						
	If permanent infiltration ponds are used for flow control during construction, are they protected from siltation?						
4 Sediment Controls	All perimeter sediment controls (e.g. silt fence, wattles, compost socks, berms, etc.) installed, and maintained in accordance with the Stormwater Pollution Prevention Plan (SWPPP).						
	Sediment control BMPs (sediment ponds, traps, filters etc.) have been constructed and functional as the first step of grading.						
	Stormwater runoff from disturbed areas is directed to sediment removal BMP.						
5 Stabilize Soils	Have exposed un-worked soils been stabilized with effective BMP to prevent erosion and sediment deposition?						

Construction Stormwater Site Inspection Form

Element #	Inspection	BMPs Inspected			BMP needs maintenance	BMP failed	Action required (describe in section F)
		yes	no	n/a			
5 Stabilize Soils Cont.	Are stockpiles stabilized from erosion, protected with sediment trapping measures and located away from drain inlet, waterways, and drainage channels?						
	Have soils been stabilized at the end of the shift, before a holiday or weekend if needed based on the weather forecast?						
6 Protect Slopes	Has stormwater and ground water been diverted away from slopes and disturbed areas with interceptor dikes, pipes and or swales?						
	Is off-site storm water managed separately from stormwater generated on the site?						
	Is excavated material placed on uphill side of trenches consistent with safety and space considerations?						
	Have check dams been placed at regular intervals within constructed channels that are cut down a slope?						
7 Drain Inlets	Storm drain inlets made operable during construction are protected.						
	Are existing storm drains within the influence of the project protected?						
8 Stabilize Channel and Outlets	Have all on-site conveyance channels been designed, constructed and stabilized to prevent erosion from expected peak flows?						
	Is stabilization, including armoring material, adequate to prevent erosion of outlets, adjacent stream banks, slopes and downstream conveyance systems?						
9 Control Pollutants	Are waste materials and demolition debris handled and disposed of to prevent contamination of stormwater?						
	Has cover been provided for all chemicals, liquid products, petroleum products, and other material?						
	Has secondary containment been provided capable of containing 110% of the volume?						
	Were contaminated surfaces cleaned immediately after a spill incident?						
	Were BMPs used to prevent contamination of stormwater by a pH modifying sources?						

Construction Stormwater Site Inspection Form

Element #	Inspection	BMPs Inspected			BMP needs maintenance	BMP failed	Action required (describe in section F)
		yes	no	n/a			
9 Cont.	Wheel wash wastewater is handled and disposed of properly.						
10 Control Dewatering	Concrete washout in designated areas. No washout or excess concrete on the ground.						
	Dewatering has been done to an approved source and in compliance with the SWPPP.						
	Were there any clean non turbid dewatering discharges?						
11 Maintain BMP	Are all temporary and permanent erosion and sediment control BMPs maintained to perform as intended?						
12 Manage the Project	Has the project been phased to the maximum degree practicable?						
	Has regular inspection, monitoring and maintenance been performed as required by the permit?						
	Has the SWPPP been updated, implemented and records maintained?						

E. Check all areas that have been inspected. ✔

All in place BMPs ☐ All disturbed soils ☐ All concrete wash out area ☐ All material storage areas ☐
All discharge locations ☐ All equipment storage areas ☐ All construction entrances/exits ☐

F. Elements checked "Action Required" (section D) describe corrective action to be taken. List the element number; be specific on location and work needed. Document, initial, and date when the corrective action has been completed and inspected.

Element #	Description and Location	Action Required	Completion Date	Initials

Attach additional page if needed

Sign the following certification:

"I certify that this report is true, accurate, and complete, to the best of my knowledge and belief"

Inspected by: (print) _____ (Signature) _____ Date: _____

Title/Qualification of Inspector: _____

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