

Memo

To: Kurt Paschl, Beazer East, Inc.
From: Steve Barnett
Melissa Roskamp
Tel: (503) 639-3400
Fax: (503) 620-7892
Date: January 10, 2016

Project: 0091510120.2015.B
cc: Michael Hassett, GP
Jeff Sorensen, GP
Project File

Subject: **Quarterly Operation, Monitoring, and Maintenance Summary,
Fourth Quarter 2015: October 1, 2015, through December 31, 2015**
Former Koppers Facility
Wauna, Oregon

On behalf of Beazer East, Inc. and Georgia-Pacific Consumer Products LP (GP), this memorandum has been prepared by Amec Foster Wheeler Environment & Infrastructure, Inc. to summarize operation, maintenance, and performance monitoring for the final site remedy at the former Koppers facility in Wauna, Oregon. This report covers the fourth quarter of 2015, from October 1, 2015 through December 31, 2015. This report has been prepared in accordance with the requirements specified in the Operation, Monitoring, Inspection, and Maintenance Plan (O&M Plan) approved by the Oregon Department of Environmental Quality in January 2010 and the requirements specified in Order on Consent No. LQVC-NWR-09-01.

SUMMARY OF OPERATIONS

Biweekly inspections of the aeration trench system and biweekly readings of dissolved oxygen and pH were taken in aeration trench wells ATT-07, ATT-08, and ATT-09, in general accordance with the O&M Plan. Copies of the biweekly inspection forms are included in Attachment 1. The operating factor for the system for the fourth quarter was 100 percent. No planned maintenance shutdowns of the aeration system occurred during the fourth quarter.

MAINTENANCE

Chemical treatment to remove fouling was completed on October 14, 2015, on air sparge line segments 1, 4, and 6. The sparge-line segments were treated with glycolic acid and dispersant, in accordance with the O&M Plan. The treatment resulted in a significant increase in flow for the lines treated.

SEMIANNUAL GROUNDWATER MONITORING

The second 2015 semiannual groundwater monitoring event was conducted on October 13 and 14, 2015. Groundwater level readings were taken on October 13 and are summarized on Table 1. The water level measurements were used to prepare the groundwater contours presented in Figure 1. The groundwater flow pattern shown on Figure 1 is consistent with previous results and demonstrates that the final groundwater remedy continues to meet hydraulic performance objectives. This is the first monitoring event for replacement well PMW-7R, which was installed to replace PMW-7 in May 2015.

Quarterly Operation, Monitoring, and Maintenance Summary
January 10, 2016
Page 2 of 2

During semiannual groundwater monitoring the 13 groundwater quality monitoring wells for the final remedy were sampled and analyzed in accordance with the requirements specified in the O&M Plan. The analytical results are consistent with previous results and are summarized in Table 2. The groundwater sampling logs are included in Attachment 2. Monitoring results for the point-of-compliance wells were all well below the Level II screening level values. Water quality parameter field measurements taken during sampling are presented in Table 3.

Attachments: Table 1: October 13, 2015, Groundwater Elevations
 Table 2: October 2015 Groundwater Monitoring Analytical Results
 Figure 1: Groundwater Elevations
 Attachment 1: Bi-Weekly Inspection Forms
 Attachment 2: Groundwater Sampling Logs



TABLES

TABLE 1
OCTOBER 13, 2015 GROUNDWATER ELEVATIONS ¹
Former Koppers Facility
Wauna, Oregon

Well Number	Time	Ground Elevation ¹ (feet)	Top of Casing Elevation ¹ (feet)	Groundwater		
				Measured Depth to Water (feet btoc)	Depth Below Grade (feet)	Elevation ¹ (feet)
ATT-01	9:36	10.26	12.31	6.63	4.58	5.68
ATT-02	9:41	12.69	15.21	9.49	6.97	5.72
ATT-03	9:51	11.51	14.06	8.40	5.85	5.66
ATT-04	9:54	10.54	12.73	7.21	5.02	5.52
ATT-05	9:30	12.43	14.37	8.41	6.47	5.96
ATT-06	9:10	11.98	14.11	8.15	6.02	5.96
ATT-10	9:34	10.42	12.57	6.54	4.39	6.03
ATT-11	9:59	12.21	13.88	8.50	6.83	5.38
ATT-12	10:04	9.34	11.27	6.45	4.52	4.82
PMW-2	8:30	9.18	11.62	4.86	2.42	6.76
PMW-5	11:05	12.72	12.33	5.47	5.86	6.86
PMW-6	8:33	9.38	9.28	2.74	2.84	6.54
PMW-7R ²	10:06	9.28	11.82	6.73	4.19	5.09
PMW-13	9:25	11.21	13.54	7.12	4.79	6.42
SBW-01	9:19	10.25	12.35	8.10	6.00	4.25
SBW-02	9:22	10.29	12.71	6.25	3.83	6.46
SBW-03	8:16	10.65	10.06	5.31	5.90	4.75
SBW-04	8:14	11.29	10.87	4.09	4.51	6.78
SBW-05	8:26	10.42	10.06	4.43	4.79	5.63
SBW-06	8:23	11.42	11.02	4.24	4.64	6.78
SBW-07	8:20	10.86	10.51	5.33	5.68	5.18
SBW-08	8:10	9.37	8.85	4.02	4.54	4.83
SBW-09	9:16	10.65	12.85	8.49	6.29	4.36
SBW-10	9:14	10.85	12.91	6.79	4.73	6.12

Notes

1. Elevation Datum: NGVD29. All elevations are relative to this datum.
2. PMW-7 was abandoned and replaced in May of 2015. PMW-7R was surveyed after installation.

Abbreviations

btoc = below top of casing
 NGVD29 = National Geodetic Vertical Datum of 1929

TABLE 2
OCTOBER 2015 GROUNDWATER MONITORING ANALYTICAL RESULTS
Former Koppers Facility
Wauna, Oregon

Concentrations are in micrograms per liter (µg/L)

Constituent	ATT-01	ATT-02	ATT-03	ATT-04	ATT-05	ATT-06	ATT-06 ³	Level II SLV
Date	10/13/2015	10/13/2015	10/13/2015	04/23/2015	10/13/2015	10/13/2015	10/13/2015	(µg/L) ⁴
Ethylbenzene	0.050 U	12.0	0.050 U	0.050 J	53	0.64	0.11	7.3
2-Methylphenol	0.11 U	0.11 U	0.11 U	0.12 U	0.11 U	0.11 U	0.11 U	13
Benzoic acid	2.0 U, i	2.1 U, i	2.2 J	1.8 J	1.1 U	1.9 U, i	2.0 U, i	42
Naphthalene	0.7	500 D	0.037 J	1.5	2,000 D	7.0	0.56 J	620
Dibenzofuran	0.066 J	6.8	0.018 U	0.019 U	17	0.7	0.10	3.7
Fluorene	0.46	18 D	0.027 U	0.028 U	28 D	8.6	8.4	3.9
Pentachlorophenol	0.34 U	0.34 U	0.34 U	0.35 U	0.34	0.34 U	0.34 U	15
Phenanthrene	0.039 J	3.8	0.022 U	0.023 U	6.3	4.1	1.6	6.3
Fluoranthene	0.020 U	0.020 U	0.020 U	0.021 U	0.047 J	0.12 J	0.024	6.2
bis(2-Ethylhexyl) phthalate	0.13 U	0.13 U	0.27 J	1.1	0.13	0.13 U	0.14	3

Constituent	ATT-10	ATT-11	ATT-12*	PMW-7R*	SBW-05	SBW-07	SBW-08*	Level II SLV
Date	10/13/2015	10/13/2015	10/13/2015	10/13/2015	10/13/2015	10/13/2015	10/13/2015	(µg/L) ⁴
Ethylbenzene	0.12 J	0.20 J	0.060 J	0.050 U	0.050 U	0.050 U	0.050 U	7.3
2-Methylphenol	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	13
Benzoic acid	2.0 U, i	2.0 U, i	2.2 U	2.3 J	2.0 U i	1.9 J	1.9 J	42
Naphthalene	0.59 J	43 D	4.7	0.022 U	0.088 J	0.022 U	0.022 U	620
Dibenzofuran	0.089 J	0.21	0.018 U	0.018 U	0.18 J	0.018 U	0.018 U	3.7
Fluorene	8.0	0.4	0.027 U	0.027 U	14	0.027 U	0.027 U	3.9
Pentachlorophenol	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	15
Phenanthrene	1.6	0.022 U	0.042 J	0.022 U	0.25	0.022 U	0.022 U	6.3
Fluoranthene	0.025 J	0.020 U	0.020 U	0.020 U	0.24	0.020 U	0.020 U	6.2
bis(2-Ethylhexyl) phthalate	0.27 J	0.95 J	0.19 J	0.13 U	0.14 J	0.17 J	0.13 U	3

Notes

- Data qualifiers are as follows:
 - D The result is reported from a dilution.
 - J The reported result is an estimate.
 - U Analyte was not detected at the concentrations indicated which is standard laboratory detection limit.
 - i The detection limit for this analyte is elevated due to matrix interference.
- Bold** indicates that the constituent concentration exceeds the Oregon Level II SLV.
- Duplicate sample.
- Level II SLVs taken from Oregon Department of Environmental Quality Guidance for Ecological Risk Assessment Level II Screening Level Values December 2001.

Abbreviations

SLV Oregon Department of Environmental Quality Screening Level Value

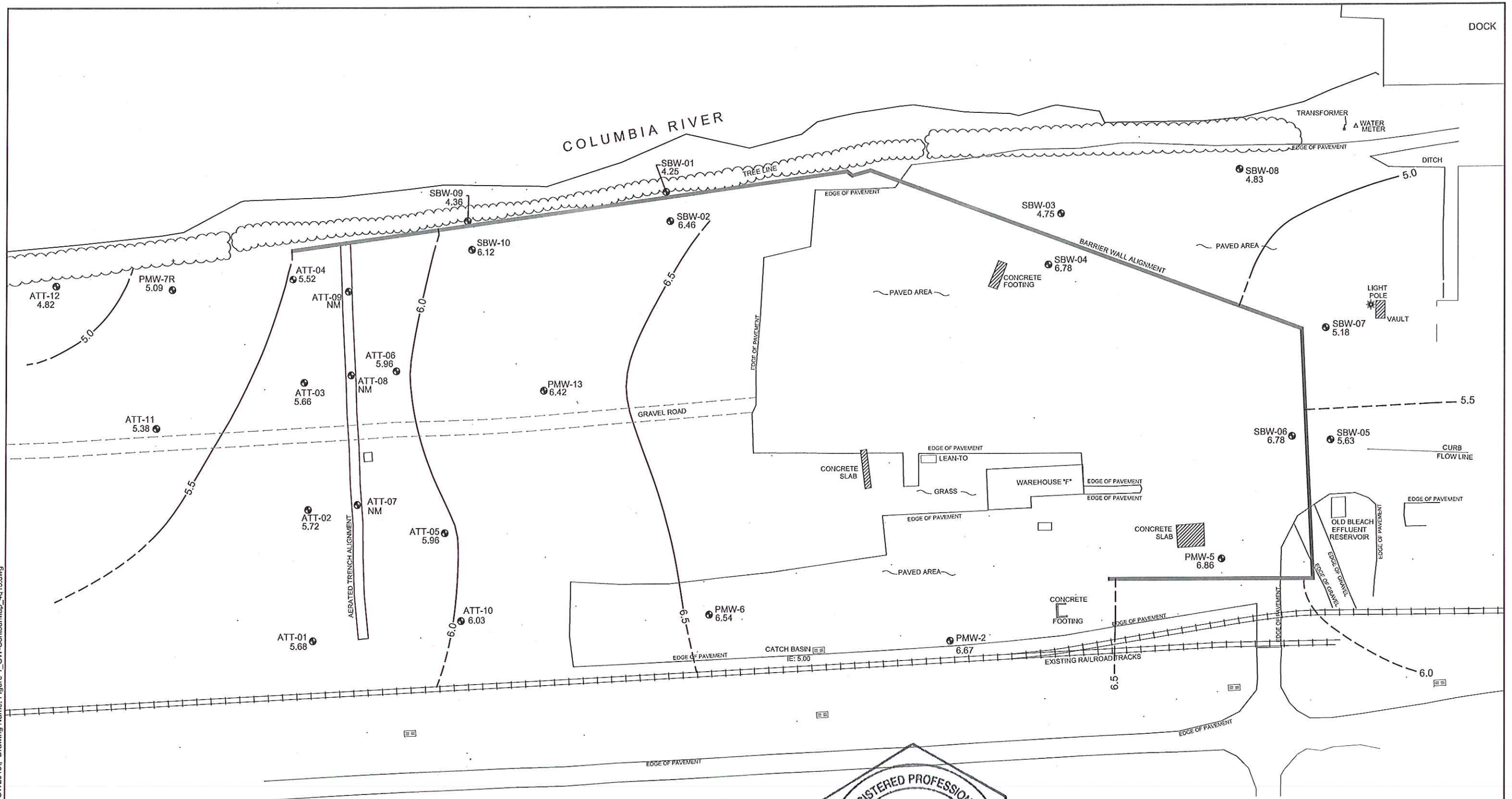
µg/L micrograms per liter

* indicates point of compliance well



FIGURES

Plot Date: 01/04/16 - 2:18pm, Plotted by: patrick.mccarthy
Drawing Path: \\sae2-1s1s-3000s19151053_4thQtrGW2015_ Drawing Name: Figure 1_GW-ContourMap_4q15.dwg

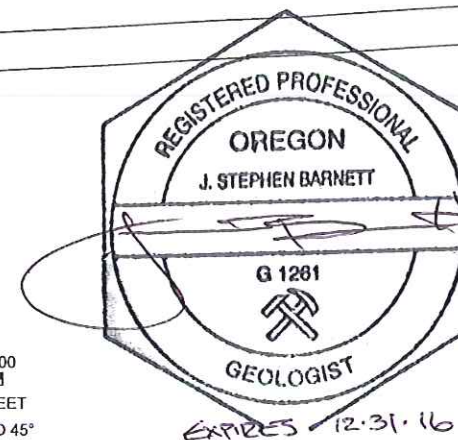
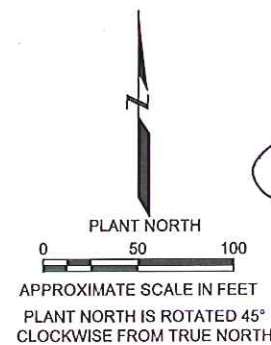


LEGEND:

- ATT-10 7.99 Groundwater Monitoring Well with Groundwater Elevation (Feet)
- 7.0 Groundwater Elevation Contour (In Feet Above Mean Sea Level) (Dashed Where Approximate)
- NM Groundwater elevations were not measured for wells completed in active aeration trench or because the groundwater elevation exceeded the top of casing elevation.

NOTES:

1. Contour Interval = 0.5 (feet)
2. Vertical Datum is based on NGVD 29
3. No contours were drawn along the river north of the barrier wall due to insufficient data.



GROUNDWATER ELEVATIONS OCTOBER 13, 2015 Former Koppers Facility Wauna, Oregon

By: PM	Date: 01/04/16	Project No. 09151
Amec Foster Wheeler Environment & Infrastructure, Inc.		Figure 1



ATTACHMENT 1

Bi-Weekly Inspection Forms

Aeration Trench Inspection Form
Groundwater Seeps Interim Remedial Measure
Former Koppers Facility
Wauna, Oregon

Date/Time	System Status (On/Off)	High Pressure Light (On/Off)	Low Pressure Light (On/Off)	PI-1 Pressure (psi)	PI-2 Pressure (psi)	T1 Temp. (° F)	Bleeder Valve Flow (scfm)	FI-1 System Flow (in. H ₂ O)	FI-1 System Flow (cfm)	Run Time Meter (hours)
10-14-15 13:30	On	Off	Off	16.5	16.5	118	2.0	4.15	Na	3638.9
16:00	On	Off	Off	16.0	16.0	78	2.0	3.87	Na	3641.4

Chart Recorder Flow (cfm)	Change Circle Chart (Yes/No)	Sparge Zone 1		Sparge Zone 2		Sparge Zone 3		Sparge Zone 4		Sparge Zone 5	
		PI-Z1 Pressure (psi)	FI-Z1 Flow (cfm)	PI-Z2 Pressure (psi)	FI-Z2 Flow (cfm)	PI-Z3 Pressure (psi)	FI-Z3 Flow (cfm)	PI-Z4 Pressure (psi)	FI-Z4 Flow (cfm)	PI-Z5 Pressure (psi)	FI-Z5 Flow (cfm)
4.15	YES	16.0	0.8	6.5	1.4	10.25	1.7	15.5	0.6	6.0	2.24
3.87		OFF	OFF	10.75	2.2	16.0	2.0	OFF	OFF	5.75	2.2

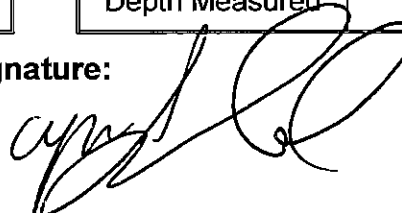
Sparge Zone 6		Sparge Zone 7		Sparge Zone 8		Sparge Zone 9		Sparge Zone 10		Sparge Zone 11	
PI-Z6 Pressure (psi)	FI-Z6 Flow (cfm)	PI-Z7 Pressure (psi)	FI-Z7 Flow (cfm)	PI-Z8 Pressure (psi)	FI-Z8 Flow (cfm)	PI-Z9 Pressure (psi)	FI-Z9 Flow (cfm)	PI-Z10 Pressure (psi)	FI-Z10 Flow (cfm)	PI-Z11 Pressure (psi)	FI-Z11 Flow (cfm)
16.0	1.4	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off
OFF	OFF	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off

	ATT-07	ATT-08	ATT-09
Well Depth (ft BTOC)	15	14.5	13.5
Water Level (ft BTOC)	8.71	8.15	6.81
Center of Water Column	11.86	11.33	10.16

	ATT-07	ATT-08	ATT-09
pH	6.68	6.76	7.14
DO (mg/l)	0.29	9.51	1.86
Depth Measured	11.86	11.33	10.16

Name :
William McFarland Senior Environmental Technician
AMEC Earth & Environmental, Inc.
7376 SW Durham Road
Portland, Oregon 97224

Signature:



Site inspection performed (yes/no)



Signature:

Aeration Trench Inspection Form

Groundwater Seeps Interim Remedial Measure
Former Koppers Facility
Wauna, Oregon

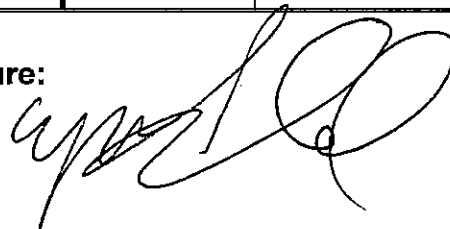
Maintenance Issue			Maintenance Issue Resolution		
Name	Date/Time	Description	Name	Date/Time	Description
William McFarland & Jason Gardner	10-14-15	Checked the oil level in new compressor	William McFarland & Jason Gardner	10-14-15	Oil level was approx 3/4 of the way up the sight glass.
William McFarland & Jason Gardner	10-14-15	Acid wash of lines 1, 4, & 6	William McFarland & Jason Gardner	10-14-15	Acid wash of lines 1, 4, & 6
William McFarland	08-26-15	Drums on site	William McFarland	08-26-15	5 total 3 Development/Purge Water 2 Asphalt/Gravel From SBW 8 Monument Replacement

Name :

William McFarland Senior Environmental Technician
AMEC Earth & Environmental, Inc.
7376 SW Durham Road
Portland, Oregon 97224

C:\Users\bill.mcfarland\Desktop\Stuff\Wauna\2015\Wauna 10-14-15 Report.docx

Signature:



Site inspection performed (yes/no)

yes

10/14/15

Sparge Zone Chemical Treatment Form

Zone	Date	Depth to Water		Air filled pipe	Total Zone Length	Water Filled Pipe	Volume Water in Zone	Target Dose		Volume Added to Sparge Zone		
		Inlet Leg	Cleanout Leg	(inlet+cleanout)		(Total- Air filled pipe)	(0.13 *water filled pipe)	Acid	Nuwell	Acid	Nuwell	Water
		ft btoc	ft btoc	feet	feet	feet	gallons	%	%	gallons	gallons	gallons
EXAMPLE	1/1/2009	9.5	8	17.5	53	35.5	4.6	3	3	0.3	0.2	1
1	10/14/15	3.30	3.70	7.00	53	46.0	5.98	3	3	.3	.2	.9
2					54							
3					57							
4	10/14/15	6.50	6.05	12.55	59.75	47.20	6.136	3	3	.3	.2	.9
5					58.25							
6	10/14/15	*	13.10	26.20*	57.5	31.30	4.07	3	3	.2	.2	1.1
7					60.5							
8					62							
9					59.5							
10					58							
11					64.25							

* This leg could not be opened - Air filled pipe is estimated

Procedure Outline

- 1) Confirm with Process Engineer for zones to be treated and target acid and biodispersant doses to be used.
 - 2) Take regular weekly system readings.
 - 3) Turn off Air Sparge compressor and isolate zones to be treated by closing both ball valves and needle valve to those zones.
 - 4) Open zones to be treated at both ends (if possible) and allow to vent for 5 minutes. (Use asterisk if one leg cannot be opened)
 - 5) Measure depth to water at both legs in zones to be treated. If only one leg is able to be opened, use that depth for both legs. Record depths.
 - 6) Calculate total length of air filled pipe in each zone, then subtract from Total Zone Length to get Water Filled Pipe. Record values.
 - 7) Calculate gallons of water in sparge zone by multiplying water filled pipe by 0.13. Record Value. Contact Process Engineer to review calculations.
 - 8) Contact Process Engineer to review calculations and determine solution preparation and chemical volumes for each zone to be treated.
 - 9) After donning appropriate PPE, add water, then biodispersant, then acid to a clean bucket for desired treatment zone. Record actual volumes used to nearest 1/10th of a gallon.
 - 10) Slide Polyethelene tubing into sparge zone to be treated, 2/3 of distance down zone.
 - 11) Using a peristaltic pump, pump mixture into the zone, pull back tubing to spread chemical mixture across length of zone.
 - 12) Close up access ports for all zones treated, leaving air inlet valves shut.
 - 13) Restart air sparge compressor and balance flows to remaining open sparge zones.
 - 14) On next weekly inspection or at time designated by the Process Engineer open zones, check for leaks, and rebalance flows. Record date and time valves reopened.
- See full Airsparge Zone Cleanout Plan for full procedure and health and safety requirements.

Aeration Trench Inspection Form

Groundwater Seeps Interim Remedial Measure
Former Koppers Facility
Wauna, Oregon

Date/Time	System Status (On/Off)	High Pressure Light (On/Off)	Low Pressure Light (On/Off)	PI-1 Pressure (psi)	PI-2 Pressure (psi)	T1 Temp. (° F)	Bleeder Valve Flow (scfm)	FI-1 System Flow (in. H ₂ O)	FI-1 System Flow (cfm)	Run Time Meter (hours)
10-23-15 09:00	On	Off	Off	15.0	15.0	108	1.0	3.95	Na	3850.2
10:20	On	Off	Off	15.0	15.0	100	1.0	3.92	Na	3851.8

Chart Recorder Flow (cfm)	Change Circle Chart (Yes/No)	Sparge Zone 1		Sparge Zone 2		Sparge Zone 3		Sparge Zone 4		Sparge Zone 5	
		PI-Z1 Pressure (psi)	FI-Z1 Flow (cfm)	PI-Z2 Pressure (psi)	FI-Z2 Flow (cfm)	PI-Z3 Pressure (psi)	FI-Z3 Flow (cfm)	PI-Z4 Pressure (psi)	FI-Z4 Flow (cfm)	PI-Z5 Pressure (psi)	FI-Z5 Flow (cfm)
3.95	YES	OFF	OFF	10.0	2.20	14.5	2.5	OFF	OFF	3.5	2.20
3.92		OFF	OFF	10.0	2.20	14.5	2.5	OFF	OFF	3.5	2.20

Sparge Zone 6		Sparge Zone 7		Sparge Zone 8		Sparge Zone 9		Sparge Zone 10		Sparge Zone 11	
PI-Z6 Pressure (psi)	FI-Z6 Flow (cfm)	PI-Z7 Pressure (psi)	FI-Z7 Flow (cfm)	PI-Z8 Pressure (psi)	FI-Z8 Flow (cfm)	PI-Z9 Pressure (psi)	FI-Z9 Flow (cfm)	PI-Z10 Pressure (psi)	FI-Z10 Flow (cfm)	PI-Z11 Pressure (psi)	FI-Z11 Flow (cfm)
Off	OFF	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off
OFF	OFF	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off

	ATT-07	ATT-08	ATT-09
Well Depth (ft BTOC)	15	14.5	13.5
Water Level (ft BTOC)	8.88	8.28	6.96
Center of Water Column	11.94	11.39	10.23

	ATT-07	ATT-08	ATT-09
pH	6.31	6.58	6.52
DO (mg/l)	0.17	3.37	0.95
Depth Measured	11.94	11.39	10.23

Name :

William McFarland Senior Environmental Technician
AMEC Earth & Environmental, Inc.
7376 SW Durham Road
Portland, Oregon 97224

Signature:



Site inspection performed (yes/no)

yes

Signature:

Aeration Trench Inspection Form
Groundwater Seeps Interim Remedial Measure
Former Koppers Facility
Wauna, Oregon

Maintenance Issue			Maintenance Issue Resolution		
Name	Date/Time	Description	Name	Date/Time	Description
William McFarland	10-23-15	Checked the oil level in new compressor	William McFarland	10-23-15	Oil level was approx 3/4 of the way up the sight glass.
William McFarland	10-23-15	Chart Pen Dried Out	William McFarland	10-23-15	Replaced Chart Pen
William McFarland	08-26-15	Drums on site	William McFarland	08-26-15	5 total 3 Development/Purge Water 2 Asphalt/Gravel From SBW 8 Monument Replacement

Name :
William McFarland Senior Environmental Technician
AMEC Earth & Environmental, Inc.
7376 SW Durham Road
Portland, Oregon 97224

Signature:



Site inspection performed (yes/no)

(yes)

Aeration Trench Inspection Form

Groundwater Seeps Interim Remedial Measure
Former Koppers Facility Wauna, Oregon

Date/Time	System Status (On/Off)	High Pressure Light (On/Off)	Low Pressure Light (On/Off)	PI-1 Pressure (psi)	PI-2 Pressure (psi)	T1 Temp. (° F)	Bleeder Valve Flow (scfm)	FI-1 System Flow (in. H ₂ O)	FI-1 System Flow (cfm)	Run Time Meter (hours)
11-03-15 14:00	On	Off	Off	15.5	15.5	111	na	Na	Na	4120.5
16:30	On	Off	Off	15.5	15.5	111	Na	na	na	4122.5

Chart Recorder Flow (cfm)	Change Circle Chart (Yes/No)	Sparge Zone 1		Sparge Zone 2		Sparge Zone 3		Sparge Zone 4		Sparge Zone 5	
		PI-Z1 Pressure (psi)	FI-Z1 Flow (cfm)	PI-Z2 Pressure (psi)	FI-Z2 Flow (cfm)	PI-Z3 Pressure (psi)	FI-Z3 Flow (cfm)	PI-Z4 Pressure (psi)	FI-Z4 Flow (cfm)	PI-Z5 Pressure (psi)	FI-Z5 Flow (cfm)
3.76	Yes	Off	Off	10.25	2.3	15.5	2.5	Off	Off	6.0	2.1
4.59	Yes	15.5	0.6	9.25	2.1	13.75	2.1	15.5	0.6	5.75	2.1

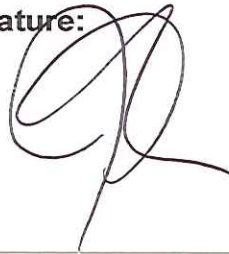
Sparge Zone 6		Sparge Zone 7		Sparge Zone 8		Sparge Zone 9		Sparge Zone 10		Sparge Zone 11	
PI-Z6 Pressure (psi)	FI-Z6 Flow (cfm)	PI-Z7 Pressure (psi)	FI-Z7 Flow (cfm)	PI-Z8 Pressure (psi)	FI-Z8 Flow (cfm)	PI-Z9 Pressure (psi)	FI-Z9 Flow (cfm)	PI-Z10 Pressure (psi)	FI-Z10 Flow (cfm)	PI-Z11 Pressure (psi)	FI-Z11 Flow (cfm)
Off	off	Off	off	Off	Off	Off	Off	Off	Off	Off	Off
15.5	1.4	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off

	ATT-07	ATT-08	ATT-09
Well Depth (ft BTOC)	15	14.5	13.5
Water Level (ft BTOC)	7.57	7.01	5.69
Center of Water Column (ft BTOC)	11.28	10.77	9.59

	ATT-07	ATT-08	ATT-09
pH	6.82	6.71	6.70
DO (mg/l)	0.24	1.36	3.95
Depth Measured (ft BTOC)	11.28	10.77	9.59

Name :
Jason Gardner Chief Environmental Technician
Amec Foster Wheeler
7376 SW Durham Road
Portland, Oregon 97224

C:\Users\jason.gardner\Documents\Wauna\Wauna 2015\Wauna 11-03-15.docx

Signature: 

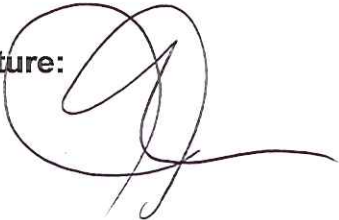
Site inspection performed (yes/no) yes

Aeration Trench Inspection Form
Groundwater Seeps Interim Remedial Measure
Former Koppers Facility Wauna, Oregon

Maintenance Issue			Maintenance Issue Resolution		
Name	Date/Time	Description	Name	Date/Time	Description
Jason Gardner	11/3/2015	Checked for sheen at seeps along Columbia river where it had been noted. Water over top of weep points.	Jason Gardner	11/03/2015	No sheen or odor was detected.
Jason Gardner	11/3/2015	Reopened SP-1, SP-4 and SP-6 after soaking for 2 weeks in acid/bio wash.	Jason Gardner	11/3/2015	Balanced out lines.

Name :
Jason Gardner Chief Environmental Technician
Amec Foster Wheeler
7376 SW Durham Road
Portland, Oregon 97224

Signature:
C:\Users\jason.gardner\Documents\Wauna\Wauna 2015\Wauna 11-03-15.docx

Signature: 

Site inspection performed (yes/no)

Aeration Trench Inspection Form

Groundwater Seeps Interim Remedial Measure
Former Koppers Facility Wauna, Oregon

Date/Time	System Status (On/Off)	High Pressure Light (On/Off)	Low Pressure Light (On/Off)	PI-1 Pressure (psi)	PI-2 Pressure (psi)	T1 Temp. (° F)	Bleeder Valve Flow (scfm)	FI-1 System Flow (in. H ₂ O)	FI-1 System Flow (cfm)	Run Time Meter (hours)
11-16-15 12:00	On	Off	Off	15.0	15.0	94	na	Na	Na	na
15:30	On	Off	Off	15.0	15.0	94	Na	na	na	4433.8

Chart Recorder Flow (cfm)	Change Circle Chart (Yes/No)	Sparge Zone 1		Sparge Zone 2		Sparge Zone 3		Sparge Zone 4		Sparge Zone 5	
		PI-Z1 Pressure (psi)	FI-Z1 Flow (cfm)	PI-Z2 Pressure (psi)	FI-Z2 Flow (cfm)	PI-Z3 Pressure (psi)	FI-Z3 Flow (cfm)	PI-Z4 Pressure (psi)	FI-Z4 Flow (cfm)	PI-Z5 Pressure (psi)	FI-Z5 Flow (cfm)
5.16	Yes	15.0	0.8	9.0	2.0	13.75	1.9	14.75	1.4	6.25	2.0
5.20	Yes	15.0	1.0	9.0	1.8	13.5	2.0	14.75	1.5	6.0	2.0

Sparge Zone 6		Sparge Zone 7		Sparge Zone 8		Sparge Zone 9		Sparge Zone 10		Sparge Zone 11	
PI-Z6 Pressure (psi)	FI-Z6 Flow (cfm)	PI-Z7 Pressure (psi)	FI-Z7 Flow (cfm)	PI-Z8 Pressure (psi)	FI-Z8 Flow (cfm)	PI-Z9 Pressure (psi)	FI-Z9 Flow (cfm)	PI-Z10 Pressure (psi)	FI-Z10 Flow (cfm)	PI-Z11 Pressure (psi)	FI-Z11 Flow (cfm)
14.5	1.4	Off	off	Off	Off	Off	Off	Off	Off	Off	Off
14.5	1.4	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off

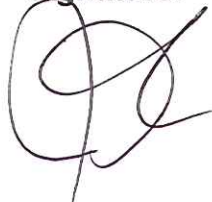
	ATT-07	ATT-08	ATT-09
Well Depth (ft BTOC)	15	14.5	13.5
Water Level (ft BTOC)	5.95	4.36	4.08
Center of Water Column (ft BTOC)	10.47	9.43	8.79

	ATT-07	ATT-08	ATT-09
pH	6.89	6.94	6.87
DO (mg/l)	0.20	2.78	6.72
Depth Measured (ft BTOC)	10.47	9.43	8.79

Name :
Jason Gardner Chief Environmental Technician
Amec Foster Wheeler
7376 SW Durham Road
Portland, Oregon 97224

C:\Users\jason.gardner\Documents\Wauna\Wauna 2015\Wauna 11-16-15.docx

Signature:



Signature:

Site inspection performed (yes/no)

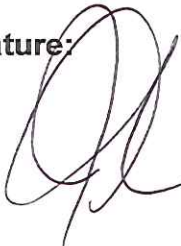
yes

Aeration Trench Inspection Form
Groundwater Seeps Interim Remedial Measure
Former Koppers Facility Wauna, Oregon

Maintenance Issue			Maintenance Issue Resolution		
Name	Date/Time	Description	Name	Date/Time	Description
Jason Gardner	11/16/2015	Checked for sheen at seeps along Columbia river where it had been noted. Water over top of weep points.	Jason Gardner	11/16/2015	No sheen or odor was detected.
Jason Gardner	11/16/2015	Unbalanced lines.	Jason Gardner	11/16/2015	Balanced out lines.

Name :
Jason Gardner Chief Environmental Technician
Amec Foster Wheeler
7376 SW Durham Road
Portland, Oregon 97224

Signature:
C:\Users\jason.gardner\Documents\Wauna\Wauna 2015\Wauna 11-16-15.docx

Signature: 

Site inspection performed (yes/no)

Aeration Trench Inspection Form
Groundwater Seeps Interim Remedial Measure
Former Koppers Facility Wauna, Oregon

Date/Time	System Status (On/Off)	High Pressure Light (On/Off)	Low Pressure Light (On/Off)	PI-1 Pressure (psi)	PI-2 Pressure (psi)	T1 Temp. (° F)	Bleeder Valve Flow (scfm)	FI-1 System Flow (in. H ₂ O)	FI-1 System Flow (cfm)	Run Time Meter (hours)
11-30-15 13:00	On	Off	Off	14.0	14.0	90	na	Na	Na	na
17:30	On	Off	Off	15.5	15.5	92	Na	na	na	4771.3

Chart Recorder Flow (cfm)	Change Circle Chart (Yes/No)	Sparge Zone 1		Sparge Zone 2		Sparge Zone 3		Sparge Zone 4		Sparge Zone 5	
		PI-Z1 Pressure (psi)	FI-Z1 Flow (cfm)	PI-Z2 Pressure (psi)	FI-Z2 Flow (cfm)	PI-Z3 Pressure (psi)	FI-Z3 Flow (cfm)	PI-Z4 Pressure (psi)	FI-Z4 Flow (cfm)	PI-Z5 Pressure (psi)	FI-Z5 Flow (cfm)
5.50	Yes	14.0	3.0* (see note)	8.5	1.5	13.5	1.6	14.25	1.2	6.00	1.8
5.05	Yes	15.5	1.0	9.0	2.0	13.5	2.0	15.0	1.6	6.25	2.0
Sparge Zone 6		Sparge Zone 7		Sparge Zone 8		Sparge Zone 9		Sparge Zone 10		Sparge Zone 11	
PI-Z6 Pressure (psi)	FI-Z6 Flow (cfm)	PI-Z7 Pressure (psi)	FI-Z7 Flow (cfm)	PI-Z8 Pressure (psi)	FI-Z8 Flow (cfm)	PI-Z9 Pressure (psi)	FI-Z9 Flow (cfm)	PI-Z10 Pressure (psi)	FI-Z10 Flow (cfm)	PI-Z11 Pressure (psi)	FI-Z11 Flow (cfm)
14.0	1.2	Off	off	Off	Off	Off	Off	Off	Off	Off	Off
15.5	1.6	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off

	ATT-07	ATT-08	ATT-09
Well Depth (ft BTOC)	15	14.5	13.5
Water Level (ft BTOC)	6.60	5.97	4.68
Center of Water Column (ft BTOC)	10.8	10.23	9.09

	ATT-07	ATT-08	ATT-09
pH	6.84	7.02	6.93
DO (mg/l)	0.20	3.14	6.35
Depth Measured (ft BTOC)	10.8	10.23	9.09

Name :
Jason Gardner Chief Environmental Technician
Amec Foster Wheeler
7376 SW Durham Road
Portland, Oregon 97224

Signature:



Site inspection performed (yes/no)

Signature:

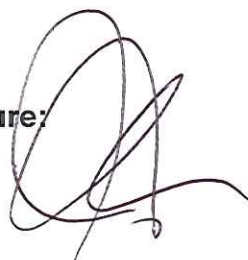
Aeration Trench Inspection Form

Groundwater Seeps Interim Remedial Measure
Former Koppers Facility Wauna, Oregon

Maintenance Issue			Maintenance Issue Resolution		
Name	Date/Time	Description	Name	Date/Time	Description
Jason Gardner	11/30/2015	Checked for sheen at seeps along Columbia river where it had been noted. Water over top of weep points.	Jason Gardner	11/30/2015	No sheen or odor was detected.
Jason Gardner	11/30/2015	(*) SP-1 line split at the top of its roto-meter.	Jason Gardner	11/30/2015	Mobed back to Ace hardware in Clatskanie and picked up parts to splice and fix line. Then returned to site and repaired line then rebalanced system.

Name :
Jason Gardner Chief Environmental Technician
Amec Foster Wheeler
7376 SW Durham Road
Portland, Oregon 97224

Signature:



Signature:

Site inspection performed (yes/no)

Aeration Trench Inspection Form

Groundwater Seeps Interim Remedial Measure
Former Koppers Facility
Wauna, Oregon

Date/Time	System Status (On/Off)	High Pressure Light (On/Off)	Low Pressure Light (On/Off)	PI-1 Pressure (psi)	PI-2 Pressure (psi)	T1 Temp. (° F)	Bleeder Valve Flow (scfm)	FI-1 System Flow (in. H ₂ O)	FI-1 System Flow (cfm)	Run Time Meter (hours)
12-14-15 12:10	On	Off	Off	14.5	14.5	110	0.0	3.15	Na	5102.7
13:30	On	Off	Off	14.5	14.5	88	0.0	3.87	Na	5104.2

Chart Recorder Flow (cfm)	Change Circle Chart (Yes/No)	Sparge Zone 1		Sparge Zone 2		Sparge Zone 3		Sparge Zone 4		Sparge Zone 5	
		PI-Z1 Pressure (psi)	FI-Z1 Flow (cfm)	PI-Z2 Pressure (psi)	FI-Z2 Flow (cfm)	PI-Z3 Pressure (psi)	FI-Z3 Flow (cfm)	PI-Z4 Pressure (psi)	FI-Z4 Flow (cfm)	PI-Z5 Pressure (psi)	FI-Z5 Flow (cfm)
3.15	YES	12.0	2.4	7.5	1.8	11.5	1.6	12.0	1.6	6.0	1.2
3.87		12.0	2.4	7.5	1.8	11.5	1.6	12.0	1.6	6.0	1.2

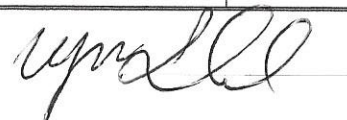
Sparge Zone 6		Sparge Zone 7		Sparge Zone 8		Sparge Zone 9		Sparge Zone 10		Sparge Zone 11	
PI-Z6 Pressure (psi)	FI-Z6 Flow (cfm)	PI-Z7 Pressure (psi)	FI-Z7 Flow (cfm)	PI-Z8 Pressure (psi)	FI-Z8 Flow (cfm)	PI-Z9 Pressure (psi)	FI-Z9 Flow (cfm)	PI-Z10 Pressure (psi)	FI-Z10 Flow (cfm)	PI-Z11 Pressure (psi)	FI-Z11 Flow (cfm)
12.0	1.2	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off
12.0	1.2	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off

	ATT-07	ATT-08	ATT-09
Well Depth (ft BTOC)	15	14.5	13.5
Water Level (ft BTOC)	5.11	4.50	3.23
Center of Water Column	10.06	9.5	8.36

	ATT-07	ATT-08	ATT-09
pH	6.68	6.87	6.99
DO (mg/l)	0.9	5.13	4.22
Depth Measured	10.06	9.5	8.36

Name :
William McFarland Senior Environmental Technician
AMEC Earth & Environmental, Inc.
7376 SW Durham Road
Portland, Oregon 97224

Signature:



Site inspection performed (yes/no)

(yes)

Signature:

Aeration Trench Inspection Form

Groundwater Seeps Interim Remedial Measure
Former Koppers Facility
Wauna, Oregon

Maintenance Issue			Maintenance Issue Resolution		
Name	Date/Time	Description	Name	Date/Time	Description

Name :
William McFarland Senior Environmental Technician
AMEC Earth & Environmental, Inc.
7376 SW Durham Road
Portland, Oregon 97224

Signature:



Site inspection performed (yes/no)

yes



ATTACHMENT 2

Groundwater Sampling Logs

October Water Level Monitoring Record

Former Koppers Facility

Wauna, Oregon

Date: 10/13/15
Measured By: Jason Gardner Instrument Used: Solines

Well Name	Time (24-hour)	TOC Elevation (feet)	Water Level Below TOC (feet)	Average WL Below TOC	Min/Max WL Below TOC	Remarks
ATT-01	9:36	12.31	6.63	2.30	2.29 / 2.9	
ATT-02	9:41	15.21	9.49	4.25	4.39 / 5.11	
ATT-03	9:51	14.06	8.40	3.27	3.29 / 4.02	
ATT-04	9:54	12.73	7.21	2.72	2.74 / 3.42	
ATT-05	9:30	14.37	8.41	3.66	3.74 / 4.50	
ATT-06	9:16	14.11	8.15	3.38	3.42 / 4.15	
ATT-10	9:34	12.57	6.54	1.78	1.62 / 2.41	
ATT-11	9:59	12.59	8.50	3.88	4.51 / 5.25	
ATT-12	10:04	13.88	6.45	2.46	2.82 / 3.31	
PMW-2	8:30	11.62	4.86	0.14	0.02 / 0.43	
PMW-5	11:05	12.33	5.47	2.94	3.04 / 3.57	
PMW-6	8:33	9.28	2.74	0.37	0.22 / 0.85	
PMW-7 R	10:00	12.34	6.73	2.72	2.77 / 3.41	
PMW-13	9:25	13.54	7.12	2.21	2.12 / 2.85	
SBW-1	9:19	12.35	8.10	4.14	3.99 / 5.43	
SBW-2	9:22	12.71	6.25	1.10	0.86 / 1.65	
SBW-3	8:16	10.06	5.31	4.46	4.31 / 5.47	
SBW-4	8:14	10.87	4.09	1.69	1.55 / 2.18	
SBW-5	8:26	10.06	4.43	3.62	3.20 / 4.68	
SBW-6	8:23	11.02	4.24	1.87	1.84 / 2.31	
SBW-7	8:20	10.51	5.33	4.36	4.40 / 5.31	
SBW-8	8:10	8.85	4.02	3.42	3.14 / 5.91	
SBW-9	9:16	12.85	8.49	4.77	4.55 / 6.29	
SBW-10	9:14	12.91	6.79	2.15	2.07 / 2.82	

Elevation Datum: NGVD 29. All elevations are relative to this datum. toc = below top of casing

ATT7 9:45
ATT8 10:08
ATT9 10:10
ATT 7- 8.69
8.16
6.84



MONITORING WELL/PIEZOMETER NUMBER **SBW-07**

Date: 10/13/15

Weather Conditions: clear

Wind Speed/Direction: ~ 3 mph west

Sampler: JG/wjm

Casing Diameter (in): 2"
 Top of Casing Elevation (ft): —
 Initial Depth to Water (ft): 9.53
 Wellhead Condition: Good

Groundwater Elevation (ft): _____
 Depth of Well Casing (ft): _____
 Actual Purge Volume (gallons): _____

Purge Volume
Cell
1
2
3
4

Other Field Observations:

GROUNDWATER SAMPLING LOG

Low Flow Sampling

MONITORING WELL/PIEZOMETER NUMBER PMW-07R

Project Name: Former Koppers Facility, Wauna, OR

Date: 10/14/15

Project Number: 9151

Weather Conditions: Clear ~68°F

Location: Wauna, OR

Sampler: JVG/WJM

Wind Speed/Direction: 1-3 East

WELL INFORMATION

Casing Diameter (in): 2"

Groundwater Elevation (ft): —

Top of Casing Elevation (ft): —

Depth of Well Casing (ft): —

Initial Depth to Water (ft): 6.73

Actual Purge Volume (gallons): 5L

Wellhead Condition: Good

PURGING MEASUREMENTS

Time	Water Level (ft btoc)	pH (std. units)	SC (ms/cm)	Temp. (°C)	ORP (mv)	Turbidity (NTU)	DO (mg/L)	Purge Volume Notes
11:25	6.75	6.41	402	61.05	-244	1.2	1.12	Cell
11:30	6.81	6.56	338	61.45	-36.0	0.8	0.33	1
11:35	6.81	6.58	222	61.30	-37.7	0.8	0.25	2
11:40	6.81	6.57	217	61.22	-37.6	0.8	0.32	3
11:45	6.81	6.56	217	61.22	-28.0	0.8	0.22	4
11:50	6.81	6.57	217	61.23	-27.6	0.8	0.20	5

Sample ID No.: PMW-07-101415

Water Level Ind. Model & No.: Solinst 101 or equivalent

ORP/DO Meter Model & No.: Horiba U-22 or equivalent

Purge Equipment Used: peristaltic pump

Sampling Equipment Used: peristaltic pump, 2" diameter disposable bailer

Purge Start Time: 11:25

Sample Collection Time: 11:50

Purge Completion Time: 11:50

Purging Method: peristaltic pump

Average Purge Rate (mL/min): 1.24/min

Sample Containers Used: x40ml (HCl), x1L

Analytical Lab: Columbia Analytical Services

Chemical Analyses: SVOCs, VOCs, MNA

Other Field Observations: _____

GROUNDWATER SAMPLING LOG

Low Flow Sampling

MONITORING WELL/PIEZOMETER NUMBER ATT-12

Project Name: Former Koppers Facility, Wauna, OR

Date: 10/14/15

Project Number: 9151

Weather Conditions: clear ~ 65 F

Location: Wauna, OR

Sampler: N6 / WSM

Wind Speed/Direction: 1-2 mph west

WELL INFORMATION

Casing Diameter (in): 2"

Groundwater Elevation (ft): -

Top of Casing Elevation (ft): -

Depth of Well Casing (ft): -

Initial Depth to Water (ft): 6.45

Actual Purge Volume (gallons): 5L

Wellhead Condition: Good

PURGING MEASUREMENTS

Time	Water Level (ft btoc)	pH (std. units)	SC (ms/cm)	Temp. (°C)	ORP (mv)	Turbidity (NTU)	DO (mg/L)	Purge Volume Notes
10:35	6.41	6.33	443	60.77	-33.5	12.6	2.98	cell
10:40	6.47	6.28	500	60.11	-39.2	4.7	2.25	1
10:45	6.47	6.33	411	60.92	-38.6	2.6	1.29	2
10:50	6.47	6.37	342	61.50	-39.0	1.2	0.49	3
10:55	6.47	6.37	332	61.56	-38.2	1.2	0.38	4
11:00	6.47	6.37	330	61.56	-38.2	1.0	0.37	5L

Sample ID No.: ATT-12- 101415

Water Level Ind. Model & No.: Solinst 101 or equivalent

ORP/DO Meter Model & No.: Horiba U-22 or equivalent

Purge Equipment Used: peristaltic pump

Sampling Equipment Used: peristaltic pump, 2" diameter disposable bailer

Purge Start Time: 10:35

Sample Collection Time: 11:00

Purge Completion Time: 11:00

Purging Method: peristaltic pump

Average Purge Rate (mL/min): 2L/M

Sample Containers Used: x40ml (HCl), x1L

Analytical Lab: Columbia Analytical Services

Chemical Analyses: SVOCS, VOCs

Other Field Observations: _____

Low Flow Sampling

MONITORING WELL/PIEZOMETER NUMBER **ATT-11**

Project Name: Former Koppers Facility, Wauna, OR

Date: 10/13/15

Project Number: 9151

Weather Conditions: Clear ~ 70

Location: Wauna, OR

Sampler: MG / WSM

Wind Speed/Direction: 12Z 7014 West

WELL INFORMATION

Casing Diameter (in): 2"

Groundwater Elevation (ft):

Top of Casing Elevation (ft): _____

Depth of Well Casing (ft): —

Initial Depth to Water (ft): 6.50

Actual Purge Volume (gallons): 50

Wellhead Condition: Good

PURGING MEASUREMENTS

[illegible]

Sample ID No.: ATT-11-101315

Water Level Ind. Model & No.: Solinst 101 or equivalent

ORP/DO Meter Model & No.: Horiba U-22 or equivalent

Purge Equipment Used: peristaltic pump

Sampling Equipment Used: peristaltic pump, 2" diameter disposable bailer

Purge Start Time: 15:15

Sample Collection Time: 15:40

Purge Completion Time: 15:40

Purging Method: peristaltic pump

Average Purge Rate (mL/min): 2.4

Sample Containers Used: x40ml (HCl), x1L

Analytical Lab: Columbia Analytical Services

Chemical Analyses: SVOCs, VOCs

Other Field Observations:

MONITORING WELL/PIEZOMETER NUMBER **ATT-04**

Date: 10/13/15

Weather Conditions: Clear ~ 70

Sampler: JVG/WSM

Wind Speed/Direction: 1-2 - west

Casing Diameter (in): 2"
 Top of Casing Elevation (ft): —
 Initial Depth to Water (ft): 7.21
 Wellhead Condition: Good

Groundwater Elevation (ft): _____
Depth of Well Casing (ft): _____
Actual Purge Volume (gallons): 56

[illegible]

Chemical Analyses: SVOCs, VOCs

Other Field Observations:

MONITORING WELL/PIEZOMETER NUMBER **ATT-03**

Date: 10/13/15

Weather Conditions: west light breeze

70°F clear

Wind Speed/Direction: west light breeze

Groundwater Elevation (ft): —

Depth of Well Casing (ft):

Actual Purge Volume (gallons): 56

[illegible]

Other Field Observations: _____

GROUNDWATER SAMPLING LOG

Low Flow Sampling

MONITORING WELL/PIEZOMETER NUMBER ATT-02

Project Name: Former Koppers Facility, Wauna, OR

Date: 10/13/15

Project Number: 9151

Weather Conditions: clear ~70

Location: Wauna, OR

Sampler: JVG/wsm

Wind Speed/Direction: ~ 1-3 mph west

WELL INFORMATION

Casing Diameter (In): 2"

Groundwater Elevation (ft): —

Top of Casing Elevation (ft): _____

Depth of Well Casing (ft):

Initial Depth to Water (ft): 9.49

Actual Purge Volume (gallons): 52

Wellhead Condition: Good

PURGING MEASUREMENTS

[illegible]

Sample ID No.: ATT-02-1015

Water Level Ind. Model & No.: Solinst 101 or equivalent

ORP/DO Meter Model & No.: Horiba U-22 or equivalent

Purge Equipment Used: peristaltic pump

Sampling Equipment Used: peristaltic pump, 2" diameter disposable bailer

Purge Start Time: 13:00

Sample Collection Time: 13:25

Purge Completion Time: 13:25

Purging Method: peristaltic pump

Average Purge Rate (mL/min): 0.244

Sample Containers Used: x40ml (HCl), x1L

Analytical Lab: Columbia Analytical Services

Chemical Analyses: SVOCs, VOCs

Other Field Observations: Phend odor

GROUNDWATER SAMPLING LOG

Low Flow Sampling

MONITORING WELL/PIEZOMETER NUMBER ATT-01

Project Name: Former Koppers Facility, Wauna, OR

Date: 10/13/15

Project Number: 9151

Weather Conditions: clear ~ 70

Location: Wauna, OR

Sampler: SV6 / W/M

Wind Speed/Direction: 1 mph west

WELL INFORMATION

Casing Diameter (in): 2"

Groundwater Elevation (ft): 7

Top of Casing Elevation (ft):

Depth of Well Casing (ft):

Initial Depth to Water (ft): 6.63

Actual Purge Volume (gallons): 5L

Wellhead Condition: Good (replaced lock)

PURGING MEASUREMENTS

Time	Water Level (ft btoc)	pH (std. units)	SC (ms/cm)	Temp. (°C)	ORP (mv)	Turbidity (NTU)	DO (mg/L)	Purge Volume Notes
12:05	6.65	6.40	277	62.95	-26.2	15.6	2.17	cell
12:10	6.70	6.39	265	62.54	-27.2	9.0	0.60	1
12:15	6.70	6.31	235	62.77	-26.8	4.3	0.31	2
12:20	6.71	6.32	221	62.86	-18.1	2.2	0.21	3
12:25	6.71	6.32	219	62.76	-18.0	1.8	0.21	4
12:30	6.71	6.33	218	62.80	-18.0	1.5	0.19	5

Sample ID No.: ATT-01- 101315

Water Level Ind. Model & No.: Solinst 101 or equivalent

ORP/DO Meter Model & No.: Horiba U-22 or equivalent

Purge Equipment Used: peristaltic pump

Sampling Equipment Used: peristaltic pump, 2" diameter disposable bailer

Purge Start Time: 12:05

Sample Collection Time: 12:30

Purge Completion Time: 12:30

Purging Method: peristaltic pump

Average Purge Rate (mL/min): 0.24m

Sample Containers Used: x40ml (HCl), x1L

Analytical Lab: Columbia Analytical Services

Chemical Analyses: SVOCs, VOCs

Other Field Observations: Replaced lock.

GROUNDWATER SAMPLING LOG

Low Flow Sampling

MONITORING WELL/PIEZOMETER NUMBER ATT-10

Project Name: Former Koppers Facility, Wauna, OR

Date: 10/13/15

Project Number: 9151

Weather Conditions: clear ~70

Location: Wauna, OR

Sampler: JVG / BJM

Wind Speed/Direction: ~70°E

WELL INFORMATION

Casing Diameter (in): 2"

Groundwater Elevation (ft): —

Top of Casing Elevation (ft): —

Depth of Well Casing (ft): —

Initial Depth to Water (ft): 6.54

Actual Purge Volume (gallons): 5L

Wellhead Condition: Good

PURGING MEASUREMENTS

Time	Water Level (ft btoc)	pH (std. units)	SC (ms/cm)	Temp. (°C)	ORP (mv)	Turbidity (NTU)	DO (mg/L)	Purge volume Notes
11:30	6.54	6.35	322	65.00	15.6	235	1.04	cell
11:35	6.61	6.17	287	65.81	-19.9	7.4	0.25	1
11:40	6.61	6.22	263	66.42	-23.6	5.6	0.22	2
11:45	6.61	6.29	228	66.28	-24.6	1.8	0.17	3
11:50	6.61	6.29	223	66.30	-24.7	1.1	0.17	4
11:55	6.61	6.30	222	66.34	-24.9	0.9	0.17	5L

Sample ID No.: ATT-10-101315 3 DUP-101315

Water Level Ind. Model & No.: Solinst 101 or equivalent

ORP/DO Meter Model & No.: Horiba U-22 or equivalent

Purge Equipment Used: peristaltic pump

Sampling Equipment Used: peristaltic pump, 2" diameter disposable bailer

Purge Start Time: 11:30

Sample Collection Time: 11:55

Purge Completion Time: 11:55

Purging Method: peristaltic pump

Average Purge Rate (mL/min): 0.24m

Sample Containers Used: x40ml (HCl), x1L

Analytical Lab: Columbia Analytical Services

Chemical Analyses: SVOCs, VOCs

Other Field Observations: Phenol odor DUP collected @ ATT10

GROUNDWATER SAMPLING LOG

Low Flow Sampling

MONITORING WELL/PIEZOMETER NUMBER ATT-05

Project Name: Former Koppers Facility, Wauna, OR

Date: 10/13/15

Project Number: 9151

Weather Conditions: clear ~70

Location: Wauna, OR

Sampler: VG / WJM

Wind Speed/Direction: ~ 5 mph

WELL INFORMATION

Casing Diameter (in): 2"

Groundwater Elevation (ft): —

Top of Casing Elevation (ft): —

Depth of Well Casing (ft): —

Initial Depth to Water (ft): 8.41

Actual Purge Volume (gallons): 5 L

Wellhead Condition: Good

PURGING MEASUREMENTS

Time	Water Level (ft btoc)	pH (std. units)	SC (ms/cm)	Temp. (°C)	ORP (mv)	Turbidity (NTU)	DO (mg/L)	Purge volume Notes
10:50	8.41	6.47	398	65.80	-46.2	0.2	2.67	cell
10:55	8.48	6.39	313	66.22	-46.5	20.3	-46.9	1
11:00	8.48	6.42	315	66.24	-48.4	9.6	-48.5	2
11:05	8.48	6.43	316	66.25	-48.8	3.6	-49.2	3
11:10	8.48	6.43	316	66.25	-48.9	2.6	-49.4	4
11:15	8.48	6.43	316	66.25	-49.3	2.2	-49.4	5

Sample ID No.: ATT-05-101315

Water Level Ind. Model & No.: Solinst 101 or equivalent

ORP/DO Meter Model & No.: Horiba U-22 or equivalent

Purge Equipment Used: peristaltic pump

Sampling Equipment Used: peristaltic pump, 2" diameter disposable bailer

Purge Start Time: 10:50

Sample Collection Time: 11:15

Purge Completion Time: 10:55 to 11:15

Purging Method: peristaltic pump

Average Purge Rate (mL/min): 2.4 L

Sample Containers Used: x40ml (HCl), x1L

Analytical Lab: Columbia Analytical Services

Chemical Analyses: SVOCS, VOCs

Other Field Observations: Bio in purge water initially.
very strong phenol odor

GROUNDWATER SAMPLING LOG

Low Flow Sampling

MONITORING WELL/PIEZOMETER NUMBER ATT-06

Project Name: Former Koppers Facility, Wauna, OR

Date: 10/13/17

Project Number: 9151

Weather Conditions: clear ~ 70

Location: Wauna, OR

Sampler: SVG / WJM

Wind Speed/Direction: ~ 3 mph west

WELL INFORMATION

Casing Diameter (in): 2"

Groundwater Elevation (ft): _____ ↗

Top of Casing Elevation (ft): _____

Depth of Well Casing (ft): _____

Initial Depth to Water (ft): 8.15

Actual Purge Volume (gallons): 46

Wellhead Condition: Good

PURGING MEASUREMENTS

[illegible]

Sample ID No.: ATT-06-101317

Water Level Ind. Model & No.: Solinst 101 or equivalent

ORP/DO Meter Model & No.: Horiba U-22 or equivalent

Purge Equipment Used: peristaltic pump

Sampling Equipment Used: peristaltic pump, 2" diameter disposable bailer

Purge Start Time: 10:15

Sample Collection Time: 10:35

Purge Completion Time: 10:35

Purging Method: peristaltic pump

Average Purge Rate (mL/min): 1.24

Sample Containers Used: x40ml (HCl), x1L

Analytical Lab: Columbia Analytical Services

Chemical Analyses: SVOCs, SVOC's DUP, VOCs, VOCs DUP

Other Field Observations:

GROUNDWATER SAMPLING LOG

Low Flow Sampling

MONITORING WELL/PIEZOMETER NUMBER SBW-05

Project Name: Former Koppers Facility, Wauna, OR

Date: 10/13/15

Project Number: 9151

Weather Conditions: clear ~ 70 F

Location: Wauna, OR

Sampler: JV6 / WJM

Wind Speed/Direction: ~ 5 MPH wes

WELL INFORMATION

Casing Diameter (in): 2"

Groundwater Elevation (ft): _____

Top of Casing Elevation (ft): _____

Depth of Well Casing (ft): _____

Initial Depth to Water (ft): _____

Actual Purge Volume (gallons): _____

Wellhead Condition: _____

PURGING MEASUREMENTS

Time	Water Level (ft btoc)	pH (std. units)	SC (ms/cm)	Temp. (°C)	ORP (mv)	Turbidity (NTU)	DO (mg/L)	Volume Notes
9:45	4.43	6.69	296	67.07	-48.5	13.4	1.67	cell
9:50	4.50	6.66	295	66.13	-63.5	4.1	1.33	1
9:55	4.50	6.65	278	66.04	-55.1	2.9	0.81	2
10:00	4.50	6.66	277	66.05	-54.6	2.1	0.33	3
10:05	4.50	6.65	277	66.04	-54.6	1.8	0.29	4
10:10	4.50	6.66	276	66.04	-54.8	1.8	0.30	5L

Sample ID No.: SBW-05- 101315

Water Level Ind. Model & No.: Solinst 101 or equivalent

ORP/DO Meter Model & No.: Horiba U-22 or equivalent

Purge Equipment Used: peristaltic pump

Sampling Equipment Used: peristaltic pump, 2" diameter disposable bailer

Purge Start Time: 9:45

Sample Collection Time: 10:10

Purge Completion Time: 10:10

Purging Method: peristaltic pump

Average Purge Rate (mL/min): ~ 24/min

Sample Containers Used: x40ml (HCl), x1L

Analytical Lab: Columbia Analytical Services

Chemical Analyses: SVOCs, VOCs

Other Field Observations: _____

MONITORING WELL/PIEZOMETER NUMBER SBW-08

Date: 10/13/15

Weather Conditions: clear ~ 64

Wind Speed/Direction: ~ 3 mph

Casing Diameter (In): 2"
Top of Casing Elevation (ft): —
Initial Depth to Water (ft): 4,02
Wellhead Condition: Good

Actual Purge Volume (gallons): 4.6



ALS Environmental

CHAIN OF CUSTODY

64112

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SR#

COC Set of

COC#

Page 1 of 2

1317 South 13th Ave, Kelso, WA 98626 Phone (360) 577-7222 / 800-695-7222 / FAX (360) 636-1068
www.alsglobal.com

Project Name: <u>W Duna</u>		Project Number: <u>915100/c</u>	
Project Manager: <u>Larry Megawhney</u>			
Company: <u>AMBCFW</u>			
Address: <u>7376 SW Dorham Rd.</u>			
Phone: <u>503 694 3400</u>			
Email: <u>mellisa.cox@ambcfw.com</u>			
Sampler Signature: <u>[Signature]</u>			
Sampler Printed Name: <u>Jason Bader</u>			
LABID		SAMPLING Date Time	Matrix
1. DW07R-101415		10/14/15 11:30	1320
2. ATT12-101415		10/14/15 11:00	
3. ATT11-101315		10/13/15 15:40	
4. ATT04-101315		14:55	
5. ATT03-101315		14:10	
6. ATT02-101315		13:25	
7. ATT01-101315		12:30	
8. ATT10-101315		11:55	
9. ATT05-101315		11:15	
10. ATT06-101315		10:35	
CLIENT SAMPLE ID		REMARKS	
14D		9260C / VOC FP	
7D		9270D / SVO TL	
NUMBER OF CONTAINERS			
Total Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Ti Sn V Zn Hg			
Dissolved Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Ti Sn V Zn Hg			
Special Instructions/Comments: <u>*Indicate State Hydrocarbon Procedure: AK CA WI Northwest Other (Circle One)</u>			
Invoice Information			
P.O.#			
Bill To:			
Turnaround Requirements			
I. Routine Report: Method Blank, Surrogate, as required		Requested Report Date	
II. Report Dup., MS, MSD as required		24 hr. _____	
III. CLP Like Summary (no raw data)		5 Day _____	
IV. Data Validation Report		Standard <u>✓</u>	
V. EDP			
Report Requirements			
Relinquished By:		Received By:	
Signature: <u>[Signature]</u>		Signature: <u>[Signature]</u>	
Printed Name: <u>D. FLATZ</u>		Printed Name: <u>[Signature]</u>	
Firm: <u>ALS Environmental</u>		Firm: <u>[Signature]</u>	
Date/Time: <u>10/14/15 17:35</u>		Date/Time: <u>[Signature]</u>	

12232 S.W. Garden Place, Tigard, OR 97223 Ph: 503-718-2323 Fax: 503-718-0333

Company: QM&C FW		Project Mgr: Larry McGeogheey		Project Name: W2UN2		Project # 9K1.001/G	
Address: 7376 SW Dabney Rd		Phone: 503 659 3400		Fax: 503 620 8952		Email: Mellise.Roskamp@qm&c.com	
Sampled by: Jason Gardner		LAB ID #		DATE		TIME	
Site Location: OR WA		SAMPLE ID		MATRIX		# OF CONTAINERS	
Other:		10/14/15		10/14/15		10/14/15	
1		SBW05-101315		10/14/15		10/14/15	
2		SBW08-101315		10/14/15		10/14/15	
3		SBW07-101315		10/14/15		10/14/15	
4		DUP - 101315		10/14/15		10/14/15	
5		TB		10/14/15		10/14/15	
6							
7							
8							
9							
10							
Normal Turn Around Time (TAT) = 7-10 Business Days		YES		NO			
TAT Requested (circle)		1 Day		2 Day		3 Day	
		4 DAY		5 DAY		Other:	
SAMPLES ARE HELD FOR 30 DAYS							
RELINQUISHED BY:		RECEIVED BY:		RECEIVED BY:		RECEIVED BY:	
Signature: [Signature]		Signature: [Signature]		Signature: [Signature]		Signature: [Signature]	
Date: 10/14/15		Date: 10/14/15		Date: 10/14/15		Date: 10/14/15	
Printed Name: Jason Gardner		Printed Name: P. FLATZ		Printed Name: P. FLATZ		Printed Name: P. FLATZ	
Time: 17:35		Time: 17:35		Time: 17:35		Time: 17:35	
Company: QM&C FW		Company: QM&C FW		Company: QM&C FW		Company: QM&C FW	