

July 7, 2017

Project No.: 661M13236.2016.B

Mr. Kenneth Thiessen
Oregon Department of Environmental Quality
Northwest Region
700 NE Multnomah St., Suite 600
Portland, OR 97232
Thiessen.Kenneth@deq.state.or.us

Subject: Semiannual Progress, Operations, Monitoring, and Maintenance Report

Former Koppers Facility

Wauna, Oregon

Dear Mr. Thiessen:

On behalf of Georgia-Pacific Consumer Products LP (GP) and Beazer East, Inc. (Beazer), this semiannual progress report has been prepared for the former Koppers wood-treating facility in Wauna, Oregon. This report is submitted in accordance with Oregon Department of Environmental Quality (DEQ) Order on Consent No. LQVC-NWR-09-01. It covers operations, monitoring, and maintenance of the final remedy completed during the first and second quarters of 2017: January 1, 2017, through June 30, 2017.

### **ACTIONS TAKEN DURING PREVIOUS SIX MONTHS**

- Monitored natural attenuation (MNA) has continued, as outlined in *Final Report: Monitored Natural Attenuation Demonstration* and approved by DEQ on May 27, 2016. The aeration trench remains off and did not operate during the first or second quarter of 2017.
- Groundwater elevations were measured during the semiannual monitoring event in April 2017 and a groundwater elevation contour map was prepared.
- Semiannual groundwater quality monitoring was performed in April 2017.
- The Annual Cap Inspection was performed in April 2017. During the inspection, animal burrows were noted in the protective soil cap. These burrows were filled and the repairs noted on the Cap, Soil Cover, and Ditch Fill Areas Inspection and Maintenance Log. This log is included in the attached Semiannual Operation, Monitoring, and Maintenance Summary.
- A site inspection, including inspection of the shoreline and seeps along the Columbia River, was performed in April 2017.

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### **ACTIONS SCHEDULED TO BE TAKEN IN THE NEXT SIX MONTHS**

 In accordance with the approved MNA plan, only semiannual and annual reports will be provided. The next scheduled report will be the 2017 Annual Report.

# PROBLEMS EXPERIENCED DURING THE PREVIOUS SIX MONTHS AND ACTIONS TAKEN TO RESOLVE THEM

No problems were experienced during the first or second quarters of 2017.

# SAMPLING, TESTING RESULTS, DATA GENERATED DURING THE PREVIOUS THREE MONTHS

 Laboratory analytical reports were received from ALS Environmental (ALS) laboratory of Kelso, Washington, containing the analytical results from the April 2017 semiannual groundwater monitoring. These data, along with groundwater level measurements, are tabulated in the Semiannual Operation, Monitoring, and Maintenance Summary enclosed with this report.

Please contact me if you have any questions regarding this progress report.

Sincerely,

Amec Foster Wheeler Environment & Infrastructure, Inc.

J. Stephen Barnett, RG Senior Associate Geologist

MR/ay

Enclosure(s): Semiannual Operation, Monitoring, and Maintenance Summary

cc: K. Paschl, Beazer East, Inc. M. Tiller, PE, Georgia Pacific J. Sorenson, Georgia Pacific



Memorandum

To Kurt Paschl Project No. 661M13236

Beazer East, Inc.

c: Kenneth Thiessen, DEQ

Matt Tiller, PE, GP

Jeff Sorensen, GP

**Project File** 

From Steve Barnett

Melissa Roskamp

Amec Foster Wheeler Environment &

Infrastructure, Inc.

Date July 7, 2017

Subject Semiannual Operation, Monitoring, and Maintenance Summary, First and

Second Quarters 2017: January 1, 2017, through June 30, 2017

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 first and second quarters of 2017, from January 1, 2017 through June 30, 2017. 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 (DEQ) in January 2010 and amended in September 2016, as well as the requirements specified in Order on Consent No. LQVC-NWR-09-01.

#### **SUMMARY OF OPERATIONS**

On June 13, 2016, the aeration trench was shut down for implementation of the monitored natural attenuation plan presented in *Final Report: Monitored Natural Attenuation Demonstration* and approved by DEQ on May 27, 2016. The aeration trench was not operated during the first or second quarters of 2017. In accordance with the O&M Plan the Annual Cap Inspection was performed in April 2017 and a copy of the inspection form is included in Attachment 1.

#### **MAINTENANCE**

On April 18, 2017, the Annual Cap Inspection was performed. During the inspection, small animal burrows were noted in the protective soil cap near PMW-11 (Figure 1). These burrows were filled and

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the repairs noted on the Cap, Soil Cover, and Ditch Fill Areas Inspection and Maintenance Log. A copy of the inspection log is included in Attachment 1.

#### SEMIANNUAL GROUNDWATER MONITORING

The first 2017 semiannual groundwater monitoring event was conducted on April 18, 2017. Groundwater level readings were taken on April 18, 2017, 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 generally consistent with previous results and demonstrates that the final groundwater remedy continues to meet hydraulic performance objectives.

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. Data validation was performed in accordance with the O&M plan. A summary of validation procedures and qualifications is included in Attachment 3.

Attachments: Table 1: April 18, 2017, Groundwater Elevations

Table 2: April 2017 Groundwater Monitoring Analytical Results

Figure 1: Groundwater Elevations
Attachment 1: Annual Cap Inspection Form
Groundwater Sampling Logs

Attachment 3: Data Validation Memo



# **ATTACHMENTS**

### **TABLE 1**

## **APRIL 18, 2017 GROUNDWATER ELEVATIONS**

Former Koppers Facility Wauna, Oregon

					Groundwater	
		Ground	Top of Casing	Measured Depth to	Depth Below	
		Elevation <sup>1</sup>	Elevation <sup>1</sup>	Water	Grade	Elevation <sup>1</sup>
Well Number	Time	(feet)	(feet)	(feet btoc)	(feet)	(feet)
ATT-01	8:36	10.26	12.31	4.14	2.09	8.17
ATT-02	8:39	12.69	15.21	6.72	4.20	8.49
ATT-03	8:42	11.51	14.06	5.67	3.12	8.39
ATT-04	8:45	10.54	12.73	4.79	2.60	7.94
ATT-05	8:30	12.43	14.37	5.51	3.57	8.86
ATT-06	8:05	11.98	14.11	5.33	3.20	8.78
ATT-10	8:33	10.42	12.57	3.60	1.45	8.97
ATT-11	8:57	12.21	13.88	5.95	4.28	7.93
ATT-12	8:52	9.34	11.27	4.79	2.86	6.48
PMW-2	7:50	9.18	11.62	2.20	-0.24	9.42
PMW-5	8:00	12.72	12.33	2.39	2.78	9.94
PMW-6	7:52	9.38	9.28	0.00	0.10	9.28
PMW-7R	8:50	9.73	11.82	4.79	0.23	9.50
PMW-13	8:01	11.21	13.54	4.18	1.85	9.36
SBW-01	8:15	10.25	12.35	6.82	4.72	5.53
SBW-02	8:16	10.29	12.71	3.17	0.75	9.54
SBW-03	7:44	10.65	10.06	4.19	4.78	5.87
SBW-04	7:41	11.29	10.87	3.07	3.49	7.80
SBW-05	7:30	10.42	10.06	4.32	4.68	5.74
SBW-06	7:32	11.42	11.02	1.30	1.70	9.72
SBW-07	7:36	10.86	10.51	4.57	4.92	5.94
SBW-08	8:50	9.37	8.85	2.99	3.51	5.86
SBW-09	8:20	10.65	12.85	7.58	5.38	5.27
SBW-10	8:21	10.85	12.91	3.86	1.80	9.05

## <u>Notes</u>

1. Elevation Datum: NGVD29. All elevations are relative to this datum.

## **Abbreviations**

btoc = below top of casing

NGVD29 = National Geodetic Vertical Datum of 1929

### TABLE 2

# APRIL 2017 GROUNDWATER MONITORING ANALYTICAL RESULTS<sup>1,2</sup>

Former Koppers Facility Wauna, Oregon

Concentrations are in micrograms per liter (µg/L)

							Dup	
Constituent	ATT-01 <sup>3</sup>	ATT-02 <sup>3</sup>	ATT-03	ATT-04	ATT-05 <sup>3</sup>	ATT-06 <sup>3</sup>	ATT-06 <sup>3</sup>	Level II SLV
Date	04/18/2017	04/18/2017	04/18/2017	04/18/2017	04/18/2017	04/18/2017	04/18/2017	(µg/L)⁴
Ethylbenzene	14	6.6	0.050 U	0.050 U	4.9	7.9 J	12 J	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	1.1 U	2.9 J	2.6 J	2.6 J	1.1 U	1.1 U	2.6 J	42
Naphthalene	230 D	280 D	0.087 J	0.022 U	0.022 U	180 D	190 D	620
Dibenzofuran	0.28	0.49	0.018 U	0.018 U	7.3	5.0	5.0	3.7
Fluorene	1.9	4.9	0.029 J	0.027 U	11	13	13	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	0.050 J	1.5	0.022 U	0.022 U	2.7	7.1	6.6	6.3
Fluoranthene	0.020 U	0.020 U	0.020 U	0.020 U	0.024 J	0.051 J	0.048 J	6.2
bis(2-Ethylhexyl) phthalate	0.99 U	1.0 U	1.0 U	0.13 U	0.97 U	2.2 J	0.99 UJ	3

#### TABLE 2

# APRIL 2017 GROUNDWATER MONITORING ANALYTICAL RESULTS<sup>1,2</sup>

Former Koppers Facility Wauna, Oregon

### Concentrations are in micrograms per liter (µg/L)

					(10 /			
Constituent	<b>ATT-10</b> <sup>3</sup> 04/18/2017	<b>ATT-11</b> 04/18/2017	<b>ATT-12</b> 04/18/2017	<b>PMW-7R</b> 04/18/2017	<b>SBW-05</b> 04/18/2017	<b>SBW-07</b> 04/18/2017	<b>SBW-08</b> 04/18/2017	Level II SLV
Date								(µg/L)⁴
Ethylbenzene	0.050 J	0.050 U	0.050 U	0.050 U	0.49 J	0.050 U	0.060 J	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	1.1 U	2.5 J	2.6 J	2.5 J	2.7 J	2.5 J	2.9 J	42
Naphthalene	1.5	0.67	0.026 J	0.022 U	34 D	0.022 U	0.33	620
Dibenzofuran	0.098 J	0.018 U	0.018 U	0.018 U	0.78	0.018 U	0.087 J	3.7
Fluorene	5.1	0.027 U	0.027 U	0.027 U	0.80	0.027 U	0.99	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	0.89	0.022 U	0.022 U	0.022 U	0.057 J	0.022 U	2.1	6.3
Fluoranthene	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.34	6.2
bis(2-Ethylhexyl) phthalate	1.0 U	0.99 U	0.13 U	1.0 U	1.0 U	0.95 U	0.76 J	3

#### <u>Notes</u>

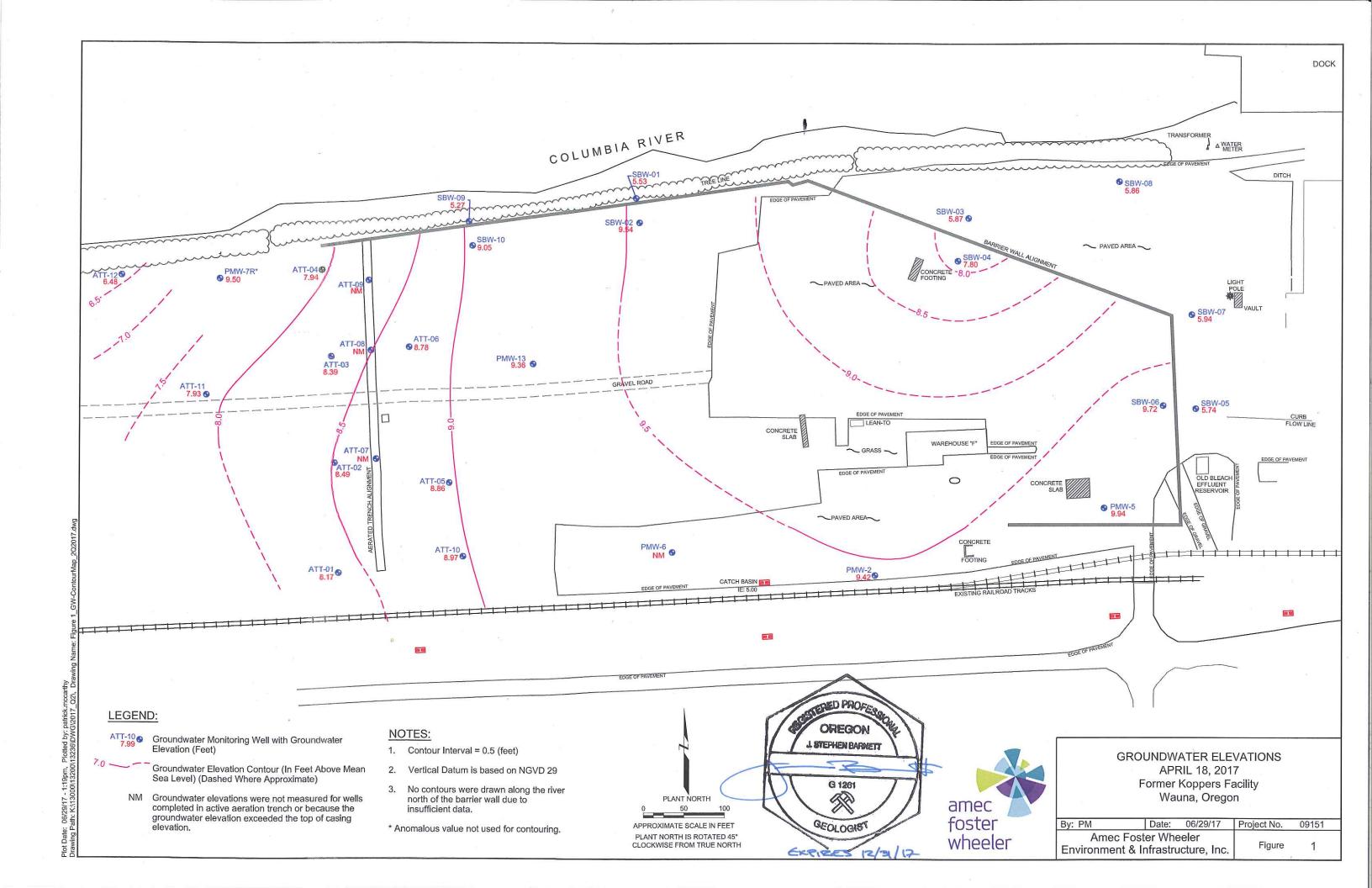
PMW-7R and ATT-12 are points of compliance.

- 1. 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.
- 2. Bold indicates that the constituent concentration exceeds the Oregon Level II SLV.
- 3. The reporting limits for these samples are elevated due to the laboratory diluting the samples prior to analysis.
- 4. Level II SLVs taken from Oregon Department of Environmental Quality, Guidance for Ecological Risk Assessment, Level II Screening Level Values, December 2001.

#### Abbreviations

 $\mu$ g/L = micrograms per liter

SLV = Oregon Department of Environmental Quality Screening Level Value





## **ATTACHMENT 1**

Annual Cap Inspection Form

# CAP, SOIL COVER, AND DITCH FILL AREAS INSPECTION AND MAINTENANCE LOG

Former Koppers Facility Wauna, Oregon

	Inspectio	n/Maintenance Issue		Maintena	nce Issue Resolution
Name	Date	Description	Name	Date	Description
Carque-	4/18/17	coffer holes 12mm-11	Jason Grandhar	4/18/17	Filled w/ GITZVE!
×	X.	Rest of CZP in good condition.			
	5	А			
,	=				

Amec Foster Wheeler, Inc.



# **ATTACHMENT 2**

**Groundwater Sampling Logs** 

## **April Water Level Monitoring Record**

## Former Koppers Facility Wauna, Oregon

Date: Measured By: +/18/17

Instrument Used:

	Time	TOC Elevation	Water Level Below	Average WL	Min/Max WL	
Well Name	(24-hour)	(feet)	TOC (feet)	Below TOC	Below TOC	Remarks
ATT-01	B:26	12.31	4,14	2.30	2.29 / 2.9	
ATT-02	8:39	15.21	6.72	4.25	4.39 / 5.11	
ATT-03	8:42	14.06	5.67	3.27	3.29 / 4.02	
ATT-04	8 45	12.73	4:79	2.72	2.74 / 3.42	, ,
ATT-05	8.30	. 14.37	5.51	3.66	3.74 / 4.50	
ATT-06	8:05	14.11	5.33	3.38	3.42 / 4.15	
ATT-10	8:55	12.57	360	1.78	1.62 / 2.41	
ATT-11	8:51	13.88	5.95	3.88	4.51 / 5.25	
ATT-12	8.5)	11.27	4.79	2.46	2.82 / 3.31	
PMW-2	7,50	11.62	3,30	0.14	0.02 / 0.43	
PMW-5	8.00	12.33	2,39	2.94	3.04 / 3.57	
PMW-6	7:52	9.28	7.06 SUFFICE	0.37	0.22 / 0.85	
PMW-7R	850	11.82	4,79	2.72	2.77 / 3.41	
PMW-13	\$8:0j	13.54	4.18	2.21	2.12 / 2.85	
SBW-1	8: 15	12.35	4.83	4.14	3.99 / 5.43	
SBW-2	8.16	12.71	3.17	1.10	0.86 / 1.65	
SBW-3	7'44	10.06	4.19	4.46	4.31 / 5.47	
SBW-4	7:41	10.87	3.07	1.69	1.55 / 2.18	
SBW-5	7:30	10.06	432	3.62	3.20 / 4.68	
SBW-6	9:32	11.02	1.30	1.87	1.84 / 2.31	
SBW-7	7136	10.51	4,57	4.36	4.40 / 5.31	
SBW-8	8'50	8.85	299	3.42	3.14 / 5.91	:
SBW-9	8520	12.85	7.58	4.77	4.55 / 6.29	
SBW-10	821	12.91	3.80	2.15	2.07 / 2.82	

Elevation Datum: NGVD 29. All elevations are relative to this datum.

toc = below top of casing

ATT - 7

ATT - 9

4,95

		MON	TORING	WELL/PIE	ZOMET	ER NU	MBER	ATT-	<u>12</u>
Project Nar	ne:	Former K	oppers F	<u>acility, Waun</u>	a, OR		Date:	4/	18/17
Project Nui	mber:	661M132	360.2016.I	B	W	eather Co	ondition	s: Par	18/17 tly clea-
Location: V	<u>Vauna</u>	a, <u>OR</u>							•
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				WEL	L INFOR	MATIO	N		
Casing Dia	mete	r (in):	2	,		Ground	water Ele	evation (ft)	
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Wellhead C	n to v ondi	vater (ft): ilon:	<u>4.7</u> 600	9		Actual P	urge vo	ınına (Ban	O118): <u> </u>
				PURGIN	G MEAS	UREM	ENTS		
Tir	ne	Water Level (ft btoc)	pH (std. units)	SC (ms/cm)	Temp.	ORP (mv)	Turbl dity (NTU)	DO (mg/L)	Notes
16.	15	4.74	6,28	494	13.57	-513	29.3	2.45	cen
		4,82	6.22	376	13.21	-46.¢	2.4	4.39	<u> </u>
	44	4.82	$\omega$ , $\partial \lambda$	376	13,21	- 401	<b>3</b> ′0	444	<b>5</b> ~
160	45	4.82	6.22	376	13,21	402	1.9	Ø.40	'Lı
Sample ID I Water Leve ORP/DO Me Purge Equi Sampling E	eter N pmer	lodel & No it Used:	Horiba perista	i 7- st 101 or equiv a U-22 or equivaltic pump altic pump, 2"	ivalent	disposab	le bailer		
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Purge Start Purge Com Average Pu Analytical L	pletic irge F	on Time: Rate (m∐m		16.12		Purging Sample	Method Contair	i: iers Used:	peristaltic pump x40ml (HCl), x1L Cs, VOCs
Other Field	Obse	ervations:							

	MONIT	ORING	WELL/PIEZ	OMETE	R NUN	IBER _	PMW-	<u> 07R</u>
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Project Number		360.2016.1	<u> </u>	AA	eather C	onaldon	9. <u> </u>	DEATY CLEON
Location: Waun	<u>a. UR</u>	w		14/	ind Snac	d/Dirocti	on: G	2057 ~ 1.2
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. ·				L INFOR				
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וחונופו טפףנה נס י Wellhead Cond	water (1t): itlon:	.ccxl	<del>184 21</del> .41		Actual F	uige vo	iuine (gai	ionaj. <u>Occ</u>
			PURGING	G MEAS	UREMI	ENTS		
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15:50	4.80	6.52	129		~21.4	<b>V</b> .7	4.41	<b>'</b>
15/55		6.53	128		-21.7		01.40	5
16:00	4.80	6.53	126	12.91	-328	47	6.41	4
Sample ID No <u>.:</u> Water Level Ind ORP/DO Meter I Purge Equipme Sampling Equip	. Model & I Model & No nt Used: ement Used e:	No.: Solins D.: Horiba perista perista	st 101 or equiva a U-22 or equi altic pump altic pump, 2"	ivalent	Sample	Collect	on Time:	
Purge Completi Average Purge Analytical Lab:	on Time: Rate (m∐n	nin):	16/60		Sample		iers Used	peristaltic pump  : x40ml (HCl), x1L  DCs, VOCs, MNA
Other Field Obs	ervations:							

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Project	Number	: <u>661M132</u>	<u>360.2016.</u>	B	W	eather C	ondition	s: Pac!	ly der
	<b>n:</b> <u>Waun</u>		i						
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				WELI	LINFOR				•
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				PURGING	G MEAS	UREMI	ENTS		
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Γ	141.20	4.77	6.62	143	12,64	53.4	89.4	2.36	(GII
	1440	4.80	6.65	1)4		37.6	l	φ. <b>2</b> 6	<u></u>
	14:45		6.62	114	12.00	376	1.2	0.26	5
L	14:50	4.80	6.63	114		37.5			4
ORP/DO	O Meter I Equipme	Vlodel & No	Horib: perist	st 101 or equivalunce of the state of the st	ivalent	disposab	le bailer		
•	•		r benst		<u>ulai i letei</u>	-		on Times	14150
Purge (	e Purge	e: on Time: Rate (mL/n ALS Kelso		141.80 141.80 1244		Purging Sample	Method Contair	ion Time: i: iers Used: ses: <u>SVO</u>	peristaltic pump x40ml (HCl), x1L
Other F	ield Obs	ervations:							

		MON	ITORING	WELL/PIE	ZOMET	ER NU	MBER	ATT-	<u>03</u>	
Project Na	ıme:	Former F	Coppers F	acility, Waun			Date:		118/17	
Project Nu	ımber:	661M132	360.2016.	В	W	eather C	ondition	s: <u>Do</u> -	thy Clegi- Euligh	<u> </u>
Location:	Wauna	a. OR							,	
Sampler:_		7/6/v	امند		W	nd Spee	d/Directi	on: <u>'2</u>	Post ~ 2-4 non	
					L INFOR	MATIO	N			
Casing Dia	ameter	r (in):	2"			Ground	water Ele	vation (ft)	):	
Top of Cas	sing E	ievation (1 Vater (ff):	t):	<i>3</i> 7		Depth o	i well Ca Purae Vo	ısıng (π): İume (gali	ons): ૠૣ	
Wellhead	Condi	ion:	ok.	<i>v.</i> F			4.90 10	ianio (Sai		
				PURGIN	G MEAS	UREM	ENTS			
Ti	ime	Water Level (ft btoc)	pH (std. units)	SC (ms/cm)	Temp. (°C)	ORP (mv)	Turbl dity (NTU)	DO (mg/L)	Notes	
1/2	135	5,65	6.65	87	12.6%	13.5	184	4.02	دردر	
		5, 12		.44	13,73		2.0	3.80	4	
		5.12	6.33	79	13.73	535	1.7	3.80	5	
10	+10	5.13	6.33	74	13.73	534	1,6	3,78	- <del>-</del>	
					1					
								_		
<b>⊢</b>										
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Sampling	• •				ulameter	-		<b>T</b> I	### T	
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Average P			nln):	124/11		Sample	Contain	ers Used:	x40ml (HCl), x1L	
Analytical						Chemic	al Analy	ses: <u>SVO</u>	Cs, VOCs	
Other Field	d Obse	ervations:								

MONITORING WELL/PIEZOMETER NUMBER \_\_\_ATT-02\_ Project Name: Former Koppers Facility, Wauna, OR Date: 4/18/17 Weather Conditions: \_\_\_\_ Project Number: 661M132360.2016.B Location: Wauna, OR Wind Speed/Direction: できず ~1-2 Ari **WELL INFORMATION** Casing Diameter (in):
Top of Casing Elevation (ft):
Initial Depth to Water (ft):
Wellhead Condition: Groundwater Elevation (ft): \_\_\_\_\_ Actual Purge Volume (gallons): \_\_ 4.7.7 Good **PURGING MEASUREMENTS** 

Time	Water Level (ft btoc)	pH (std. units)	SC (ms/cm)	Temp. (°C)	ORP (mv)	Turbi dity (NTU)	DO (mg/L)	Notes
12:50	$\omega$ . 72	w.41	195	11.72	-51.4	198	1.53	æll
13:10	6.78	6.46	acs	11.78	-62.4	116	4,74	4
13.15	6.78	6.47	302	11.78	-628	1.3	4:44	
1230	6.70	6.47	コロス	11.78	-628	1.2	di 74	<i>ω</i>
	· · · · · ·							
						-		

ter Level Ind. Model & No			
tP/DO Meter Model & No.: rge Equipment Used:	peristaltic pump		
mpling Equipment Used:	peristaltic pump, 2" diar	neter disposable bailer	
rge Start Time: rge Completion Time: erage Purge Rate (mL/mi	12:50 13:30 n): 2 4 <u>M</u>	Sample Collection Time: Purging Method: Sample Containers Used:	トラ・ス心 peristaltic pump x40ml (HCI)、x1L
alytical Lab: ALS Kelso		Chemical Analyses: SVOC	s, VOCs
ner Field Observations: _	Black organi	C 1510 TAIL ISTY ID P	uge water uf

		MON	ITORING	WELL/PII	EZOMET	ER NU	MBER	ATT-	<u>01                                    </u>	
Project	Name:	Former K	oppers F	acility, Waun	na, OR				. a.l	
							Date:	<u> </u>	18/17	
_			360.2016.	<u>B</u>	W	eather C	ondition	s: <u>Pa</u>	LlA Clega.	
Locatio	<b>n:</b> <u>Waun</u>	<u>a, OR</u>								
Sample	r;	<u> </u>	IJΜ.		W	ind Spee	d/Directi	on:	25t ~1-2 yen	
				WEL	L INFOR	RMATIO	N			
Casing	Diamete	r (in):	2'	·		Ground	water Ele	evation (ft)	1	
Top of	Casing E	ilevation (f Nater (ft):	t):			Depth o	f Well Ca	sing (ft):	ons): <u>(ei</u>	
Initial D	epth to \	Nater (ft):	<u></u>	-14		Actual F	urge Vo	iume (gaile	ons): <u>(øi</u>	
Wellhea	id Condi	tlon:	<u>(2)</u>	cod						—
				PURGIN	G MEAS	UREM	ENTS			
	Time	Water Level (ft btoc)	pH (std. units)	SC (ms/cm)	Temp.	ORP (mv)	Turbl dity (NTU)	DO (mg/L)	Notes	
Γ	12:10	4.13	4:36	3 <b>9</b> 8	14.09	~33, <sup>C</sup> 1	24.2	3.09	cell	
		4.16	6.34	349	12.71	-47.10	1.3	Ф.38	4	
				349		-47.7		Ø.38	5	
	12:40		6.34	300		-477		Ø:38	6	
L										
L										
				· :						
Water L ORP/DC	evel Ind. Meter I	Model & No	No.: <u>Solins</u> Horiba	st 101 or equi a U-22 or equ						
	quipmer	nt Usea: ment Usea		altic pump altic pump, 2"	diameter	disposab	le bailer			
•			<u> </u>		<u>viametel</u>	-			an suice	
	tart Time			12:40	<del></del>			on ilme: i:	na: Чо peristaltic pump	
Average	Purge l	on Time: Rate (mL/n ALS Kelso	າin):	:24M		Sample	Contain		x40ml (HCl), x1L	
Other F	ield Obs	ervations:								

roject Number: 6 ocation: <u>Wauna, o</u> ampler: <u></u> asing Diameter (i	61M132: OR /// / \www.h in): vation (fi ter (ft):	360.2016.I		Wi Wi L INFOR	ind Spee RMATIC Ground	d/Directi N water Ele	on:记;	117 +14 Clear as4 +2-3		
ocation: <u>Wauna, (</u> ampler:	OR /(교 / 나니./ in): vation (fi ter (ft):	n <u>2</u>	WELI	Wi L INFOR	ind Spee RMATIC Ground	d/Directi N water Ele	on:记;	as4 1. 2.3		
impler: impler: ising Diameter (i ip of Casing Elev tial Depth to Wa	OR /(교 / 나니./ in): vation (fi ter (ft):	n <u>2</u>	WELI	Wi L INFOR	ind Spee RMATIC Ground	d/Directi N water Ele	on:记;	as4 1. 2.3		
mpler: sing Diameter (i p of Casing Elev tial Depth to Wa	in): vation (fi	t):	WELI	L INFOR	RMATIC Ground	N water Ele				
sing Diameter (i p of Casing Elev tial Depth to Wa	in): vation (fi ter (ft):	t):	WELI	L INFOR	RMATIC Ground	N water Ele				
p of Casing Elevital Depth to Wa	vation (fi ter (ft):	1):	<u>-</u> εφ		Ground	water Ele	wation (ff):			
p of Casing Elevital Depth to Wa	vation (fi ter (ft):	1):	<u> </u>		Ground	water Ele	wation (ff):			
ilal Depth to Wa	ter (ft):	1):	<u>e</u>		Denth o		vanon (n):			
		- 1-6.E	<u>وس</u> برا	Top of Casing Elevation (ft): Depth of Well Casing (ft): Actual Purge Volume (gallons):						
					Muluai	-uiga vo	iullie (Ballo	iis)		
	PURGING MEASUREMENTS									
L	Water evel (ft btoc)	pH (std. units)	SC (ms/cm)	Temp.	ORP (mv)	Turbi dity (NTU)	DO (mg/L)	Notes		
11:30 3	(6)	6.75	114	13.01	-617	0.9	2.90	cen		
	3.45	6.42	<u>123</u>	13,25	-494	<b>\$.8</b>	ф.27	4		
11:55 3	3.65	6.42	123	12.23	-413	Ø.8	Φ.23	5		
12:00 3	3.65	6.41	123	12,20	-49,1	D. 3	cr,27	Ų į		
mple ID No.: ter Level Ind. M	odel & N	<b>lo.:</b> <u>Solins</u>								
P/DO Meter Mot rge Equipment U			<u>a U-22 or equi</u> altic pump	valerit						
npling Equipme			altic pump, 2"	diameter d	disposab	le bailer				
rge Start Time: rge Completion erage Purge Rat alytical Lab: <u>AL</u>	e (mL/m		11:30 ,2:00 ,2:4M		Purging Sample	Method Contain		i またの peristaltic pump x40ml (HCI), x1L s, VOCs		

	MON	ITORING	WELL/PIE	ZOMET	ER NU	MBER	ATT-	<u>05                                    </u>
Project Name:	<u>Former F</u>	Coppers F	acility, Waun	a, OR		Date:	4),	Blij
Project Number	r: <u>661M132</u>	<u>360.2016.</u>	В	W	eather C			rki clear
Location: Waun								
Sampler:	7/67 / W!	111		W	ind Spee	d/Directi	on: <u>ዲ</u>	ast ~2mp4
			WELI	L INFOR				
Casing Diamete	r (in):		)}		Ground	water Ele	evation (ft)	
Top of Casing Elevation (ft): Depth of Well Casing (ft): Initial Depth to Water (ft): Substituting							ons): 6L	
	PURGING MEASUREMENTS							
Time	Water Level (ft btoc)	pH (std. units)	SC (ms/cm)	Temp.	ORP (mv)	Turbi dity (NTU)	DO (mg/L)	Notes
10:50	5,52	6.27	248	1192	13.6	5.8	3.38	cen
11276	5.56	643	209		-349	1,6	Dica,	14
11712	5.56	6.43	209	11.55	441	1.5	0.59	5
11:20	5.56	(0.43	349	11:80	-412	1.2	456	<b>(</b> 6
					***************************************			
Sample ID No <u>.:</u> Water Level Ind ORP/DO Meter I Purge Equipme Sampling Equip	. Model & N Model & No nt Used:	lo.: <u>Solins</u> Horiba perista		valent	disposab	le bailer		
Purge Start Tim Purge Completi Average Purge I Analytical Lab:	e: on Time: Rate (m⊔m		0:50 1:30 2 4/n		Sample Purging Sample	Collecti Method Contain		nt 26 peristaltic pump x40ml (HCl), x1L Cs, VOCs
Other Field Obs	ervations:	Str	rong Phe	nol oc	lor.			

#### MONITORING WELL/PIEZOMETER NUMBER \_\_\_ATT-06\_ Project Name: Former Koppers Facility, Wauna, OR Date: Weather Conditions: Party clear Project Number: 661M132360.2016.B Location: Wauna, OR Sampler: <u>JVG/WJM</u> Wind Speed/Direction: ルセット へる ハロリ **WELL INFORMATION** Groundwater Elevation (ft): \_\_\_ Casing Diameter (in): Top of Casing Elevation (ft): \_\_\_\_\_ Depth of Well Casing (ft): Initial Depth to Water (ft): 5 33 Wellhead Condition: GC/21 **PURGING MEASUREMENTS** Turbi Water pН (std. ORP DO SC Temp. ditv Level (ft (mv) (NTU) (mg/L) Notes Time btoc) units) (ms/cm) (°C) 3.4K cell 644 134 1234 1929 2.8 10:40 5.33 **ゆ**ら 6.40 1,1 3 1362 262 ~22,4 5.40 1015 6.40 -234 111 **d**ate 4 5,40 136 1260 10:30 120 5.40 6,40 12.61 ースろろ 1.1 O.h 10:35

3 EIBITE - GOD Sample ID No.: <u>ATT-06- ○4181子</u> Water Level Ind. Model & No.: Solinst 101 or equivalent ORP/DO Meter Model & No.: Horiba U-22 or equivalent Purge Equipment Used: peristaltic pump peristaltic pump, 2" diameter disposable bailer Sampling Equipment Used: Sample Collection Time: 10.3 **Purge Start Time:** Purging Method: peristaltic pump
Sample Containers Used: x40ml (HCl), x1L Purge Completion Time: 10:35 Average Purge Rate (mL/mln): \_ Chemical Analyses: SVOCs, SVOC's DUP, VOCs, Analytical Lab: ALS Keiso VOCs DUP Other Field Observations: Dup collected w sample

	MON	TORING	<b>WELL/PIE</b>	ZOMET	ER NUI	WBER	SBW	-07	
Project Name:	<u>Former K</u>	Coppers Fa	acility, Waun	a, OR				سرام ا	
						Date:		1/18/17	
Project Number		<u>360.2016.l</u>	3	W	eather Co	onditions	B:	Portly cloud	in man
Location: <u>Waun</u>	<u>a, OR</u>	L		350		al (5) i a a 41		7	. 3
Sampler:		70@ LM	7.1	VV	ina Spee	a/Directi	оп:	ETSY WIND A	- SKAPA
			WEL	L INFOR					
Casing Diamete	r (ln):	2	9		Ground	water Ele	evation (fi	): lons):	
Top of Casing E	levation (f	t):	70		Depth of	f Well Ca	ising (ft): Jume (del	lone): (a)	
Top of Casing E Initial Depth to \ Wellhead Condi	tion:	. & K	7.1		Actual	uigo ro	idillo (gai		
	-		PURGIN	G MEAS	UREM	ENTS			
Time	Water Level (ft btoc)	pH (std. units)	SC (ms/cm)	Temp.	ORP (mv)	Turbi dity (NTU)	DO (mg/L)	Notes	
9:30			547		中35		4.35		- (C)
C1.50	4.60	6.14	490	12.79			1569.g		
9:50	11.Ko	6,30	490	12.80	1 348	(D.8)	1989. F	54	
10:00	4.62	631	490	12.83			\$1.08	6i	
10.00	1.00	- 01		10.11			10		
									_
Sample ID No <u>.:</u> Water Level Ind. ORP/DO Meter I Purge Equipme Sampling Equip Purge Start Tim	. Model & I Wodel & No nt Used: ment Used	No.: Solins D.: Horiba perista t: perista	t 101 or equiva L-22 or equalitic pump altic pump, 2" ロミスひ	ivalent	Sample	Collecti	on Time:		
Purge Completic	on Time:		(0: <i>0</i> 0			Method		peristaltic pump : x40ml (HCl), x	
Average Purge ! Analytical Lab:	K <b>ate (m⊔n</b> Als Keleo	nin): <u> </u>	<del>1 44</del> 4					: <u> </u>	11
						•		1	
Other Field Obs	ervations:								*

		MON	TORING	WELLIPIE	ZOMET	ER NU	<b>IBER</b>	SBW-	<u>08</u>	
Project l	Name:	Former k	Coppers F	acility, Waun	a, OR				en la es	
							Date:	4/1	דיןש	
Project I	Number	: <u>661M132</u>	360.2016.	B	We	eather Co	ondition	8: <u>(2)</u> ර්	8/17 10/61825146	
Location	n: <u>Waun</u>	<u>a, OR</u> _								
Sampler	10 12	WE / W	l <del>y</del>		Wi	nd Spee	d/Directi	on: <u>+7</u>	105+ -12 2-3 Apr	
				WEL	L INFOR	OITAM	N			
Casing I	Diamete	r (in):	2	# · · · · · · · · · · · · · · · · · · ·		Groundy	vater Ele	vation (ft)		
Top of C	Casing E	ievation (f	t):			Depth of	r Well Ca	lsing (π): lume (nell	ons): <u>(</u>	—
Wellhea	d Condi	rvater (It): Hon:	- Chair							
VI Omnou	2 001.01			PURGIN		UREME	ENTS			
	Time	Water Level (ft btoc)	pH (std. units)	SC (mş/cm)	Temp.	ORP (mv)	Turbl dity (NTU)	DO (mg/L)	Notes	
	48:50	3,99	5,80	152	12.46	~72,3	12,5	4.91	Len	
1	(A) 10	3.00	5.3	146			1.4	Q.54	4	
	\$1915	3.00	5,42	141.	13.47	LE9.5	1.8	9.46	5	
	19:20	3,00	5,43	146	(3.49	-887	-	443	la	
Water Le ORP/DO Purge E	evel ind Meter i quipme	Viodel & No	No.: Solins D.: Horib perist perist	st 101 or equiva a U-22 or equalitic pump altic pump, 2"	ivalent	disposab	e bailer			
Purge St Purge Co Average	Purge Start Time:  Purge Completion Time:  Purge Completion Time:  Purge Rate (mL/min):  Average Purge Rate (mL/min):  Color Sample Collection Time:  Purging Method:  Sample Containers Used:  Sample Containers Used:  Chemical Analyses:  SVOCs, VOCs									
Other Fi	eld Obs	ervations:								

		MONI	TORING	WELL/PIE	ZOMET	ER NUI	MBER	SBW-	<u>·05</u>			
Project	Name:	Former K	Coppers F	acility, Waun	a, OR							
-							Date:		11817			
Project	Number	: <u>661M132</u>	360.2016.	В	W	eather C	onditions	s: <u> </u>	itty cloudy/e	<u>(20)</u>		
Locatio	n: Waun	<u>a, OR</u>										
Sample	) <b>r</b> ;	146/v	NW		W	ind Spee	d/Directi	on:	235 ~ 1 MADA			
				WEL	L INFOR	RMATIO	N					
Casing	Diamete	r (in):	2	13		Ground	water Ele	vation (ft)				
Top of	Casing E	lievation (f	t):	20		Depth o	f Well Ca	ising (ft): Jume (gell	oneli			
Casing Diameter (in): 2"  Top of Casing Elevation (ft): 4.32  Wellhead Condition:					Actual Purge Volume (gallons):							
PURGING MEASUREMENTS												
ſ	Time	Water Level (ft btoc)	pH (std. units)	SC (ms/cm)	Temp.	ORP (mv)	Turbi dity (NTU)	DO (mg/L)	Notes			
	<b>100</b> 73.10	4.32	637	788	11.93	59.0	175	5.63	cell			
Γ		4.36			12.12	78.6	1.2	2.36	ч			
	08:35		6,24	244	13.07	78.6 78.7 78.6	ØŠ1	238	<b>ኔ</b> ግ			
	08:40	4.56	(b, 3)4	245	12.08	78.6	Ø9	239	.6			
ORP/DO Purge E	.evel Ind. D Meter I Equipme:	Model & No nt Used:	No.: Solins Horiba perist	st 101 or equiva U-22 or equ altic pump	ivalent							
		ment Used	: perist	altic pump, 2"	diameter	<u>disposab</u>	<u>le bailer</u>					
Purge C Average Analytic	e Purge I cal Lab:	e: on Time: Rate (mL/n ALS Keiso ervations:	<u>                                      </u>	3110 8140 ,24/1		Purging Sample	Method Contain		peristaltic pump x40ml (HCl), x1L Cs, VOCs			
J V: 1												

	MON	ITORING	WELL/PIE	ZOMET	ER NU	MBER	ATT	<u> 11 </u>	
Project Name:	Former K	Coppers F	acility, Waun	a, OR					
						Date:	<u>  4/18/</u>	17	
Project Number:	661M132	360,2016.I	В	W	eather Co	onditions	3:		
Location: Wauna	<u>a, OR</u>								
Sampler:	~JV6~	WM		W	ind Spee	d/Directi	on: <u>~~</u>	1-2 HPH EDST	
			WEL	L INFOR	RMATIO	N			
Casing Diameter	r (in):	2	11		Ground	vater Ele	vation (ft	):	
Top of Casing E	ievation (f	t):			Depth of	f Well Ca	ısing (ft):	): lons):	
Initial Depth to V	Vater (ft):		936 5°	<b>15</b>	Actual F	urge Vo	lume (gal	lons): <u> ്ര</u>	
Wellhead Condi	tion:	<u> </u>				••			
	PURGING MEASUREMENTS								
	Water	pН				Turbi			
Time	Level (ft btoc)	(std. units)	SC (ms/cm)	Temp.	ORP (mv)	dity (NTU)	DO (mg/L)	Notes	
	5.02	619	256		+45.1		0,69	cel(	
			274	13.10	153.3	Ф. 🕙	\$.95°	4	
17140	593	0.23	275	1312	F53.5	Ф. g	05.94	5	
17:46	5/13	6.23	275	13:19	153.7	Ф· В	Ø94	6	
				1					
				,					
	_								
Sample ID No.: Water Level Ind.	ATT-11	- 04181	<del>7</del> et 101 or equiv	valent					
ORP/DO Meter N			a U-22 or equi						
Purge Equipmen		perist	altic pump						
Sampling Equip	ment Used	i: perist	altic pump, 2"	diameter	disposab	e bailer			
Purge Start Time	<b>:</b>		17:15		Sample	Collecti	on Time:	17:45	
<b>Purge Completic</b>	n Time:		7:45		Purging	Method	l:	peristaltic pump	
Average Purge F			+2 4M	<u>-</u>				: <u>x40ml (HCl), x1L</u>	
Analytical Lab:	ALS Kelso			<del></del>	Chemic	ai Anaiy	<b>565:</b> <u>570</u>	Cs, VOCs	
Other Field Obse	ervations:								

## amec foster wheeler

## Amec Foster Wheeler E&I, Inc. FIELD INSTRUMENT CALIBRATION FORM

Project Name: WOUND
Project #: 660M (33360,20168)
Date: 41817 Time: 700

INSTRUMENTATION USED

-	I MAKE I	MODEL	IAMECFW No.
	YSI	556	15
ī	YSI	556	
	HACH	2100P	
	HACH KIT	IR-18C	
ī	Date		Time

HACH KIT   IR-180	DENGLIS DU S	DAILY CALIBR	ATIONS	THE RESIDENCE	The state of the s	
Date	Time	STANDARDIZATION:	Meter Read	Adjusted to	Units	Temp
2 1		pH7	7.07	7.01	pН	13.4
4/18/17	7.	pH4	4001	4.00	pН	13.
4118117	7:00	pH10	9,98	10,00	pH	120
VI - V 2	,	Sp. Cond.	1000	1000	us/cm³	123
		ORP D.O. %	240.6	241.7	millivolts %	123
	<b>-</b>		113.1	99.41	Units	
Date	Time	STANDARDIZATION:	Meter Read	Adjusted to	pH	Temp
		pH7 pH4	-		pН	
		рн4 рН10	-	<del></del>	pH	
		Sp. Cond.			us/cm³	
		ORP			millivolts	
		D.O. %	-		%	
Date	Time	STANDARDIZATION:	Meter Read	Adjusted to	Units	Temp
Date	Time	pH7	motor read	7 tajaotoa to	pH	
		pH4			pH	
		pH10			рН	
		Sp. Cond.			us/cm³	
,		ORP			millivolts	
7		D.O. %			%	
Date	Time	STANDARDIZATION:	Meter Read	Adjusted to	Units	Temp
		pH7			рН	
		pH4			рН	
		pH10		<b>=</b> / <b>*</b> □	pН	
		Sp. Cond.			us/cm³	
		ORP	14		millivolts	
		D.O. %			%	
Date	Time	STANDARDIZATION:	Meter Read	Adjusted to	Units	Temp
		pH7			pН	
7	29	pH4			pН	
		pH10			pH us/cm³	
		Sp. Cond. ORP	-		millivolts	
2		D.O. %			%	
		PERIODIC CALIBRA	TION CHECK		70	2011
Date	Time	Gelex Standards	Reading	In range?		
Date	Tille	0-10 NTUs	rtodding	in range.		
		0-100				
		0-1000				
Date	Time	Gelex Standards	Reading	In range?		
	300 100 4100	0-10 NTUs				
75		0-100				
		0-1000				
Date	Time	STANDARDIZATION:	Meter Read	Adjusted to	Units	Temp
	F	pH7			pН	
,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		pH4			pН	
Before Well		pH10			pH	
		Sp. Cond.			us/cm³	
y * 1		ORP			millivolts %	
		D.O. %	Mater Devi	Adimetralita		Tana
Date	Time	STANDARDIZATION:	Meter Read	Adjusted to	Units pH	Temp
		pH7			рн рН	
Defens Mill		pH4 pH10			· pH	
Before Well		Sp. Cond.	F	-	us/cm³	
		ORP			millivolts	
		D.O. %		)	%	
			CATENERIE (			
The second second		CERTIFICATION S	IAIEMENI			



## **ATTACHMENT 3**

Data Validation Memo



Memorandum

To Steve Barnett, Project Manager

File no 661M132360.2016.B

Amec Foster Wheeler Environment &

Infrastructure, Inc.

From Julianna Wetmore

Amec Foster Wheeler Environment &

Infrastructure, Inc.

Date 5/12/2017

Subject Former Koppers Wood Treating Site, Wauna, Oregon

April 2017 - Semiannual Groundwater Sampling Event

Stage 2A Data Validation - Sample Delivery Group K1703844

This memorandum presents a summary of the Stage 2A data validation performed on the results of 13 primary groundwater samples, one field duplicate groundwater sample, and one trip blank samples collected on April 18, 2017 at the Former Koppers Wood Treating Site in Wauna, Oregon. The samples were submitted to ALS Environmental, located in Kelso, Washington for analysis of the following:

- Ethylbenzene by EPA Method 8260C; and
- Semivolatile Organic Compounds (SVOCs) by EPA Method 8270D low level [2-methylphenol, benzoic acid, naphthalene, dibenzofuran, fluorene, pentachlorophenol, phenanthrene, fluoranthene, and bis(2-ethylhexyl)phthalate].

The sample identifications (IDs), laboratory sample IDs, and analyses conducted on the samples are listed in the table below.

Table 1: Sample IDs and Analyses

Sample ID	Laboratory Sample ID	Analyses
SBW-05-041817	K1703844-001	SVOCs and ethylbenzene
SBW-08-041817	K1703844-002	SVOCs and ethylbenzene

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Sample ID	Laboratory Sample ID	Analyses
SBW-07-041817	K1703844-003	SVOCs and ethylbenzene
ATT06-041817	K1703844-004	SVOCs and ethylbenzene
ATT05-041817	K1703844-005	SVOCs and ethylbenzene
ATT10-041817	K1703844-006	SVOCs and ethylbenzene
ATT01-041817	K1703844-007	SVOCs and ethylbenzene
ATT02-041817	K1703844-008	SVOCs and ethylbenzene
ATT03-041817	K1703844-009	SVOCs and ethylbenzene
ATT04-041817	K1703844-010	SVOCs and ethylbenzene
PMW07-041817	K1703844-011	SVOCs and ethylbenzene
ATT12-041817	K1703844-012	SVOCs and ethylbenzene
ATT11-041817	K1703844-013	SVOCs and ethylbenzene
DUP-041817	K1703844-014	SVOCs and ethylbenzene
Trip Blank	K1703844-015	ethylbenzene

Upon receipt by ALS, the sample labels were compared to the chain-of-custody. The temperatures of the coolers were recorded upon receipt and were less than the acceptable maximum temperature of 6 [C. The laboratory noted that there was an insufficient amount of sample volume to perform Matrix Spike/ Matrix Spike Duplicate (MS/MSD) analysis.

The analytical results for these samples were reviewed in accordance with the requirements specified in Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use (EPA 2009), USEPA National Functional Guidelines for Organic Data Review (EPA, 2014), and Operation, Monitoring, Inspection, and Maintenance Plan – Former Koppers Wood Treating Site – Wauna, Oregon (AMEC, 2010), the analytical methods referenced by the laboratory, Amec Foster Wheeler data review procedures, and the laboratory quality control limits. The EPA guidelines were written specifically for the Contract Laboratory Program, and have been modified for the purpose of this data quality review where they differ from the analyte specific method requirements.

The laboratory reports were reviewed to assess the following: chain of custody compliance; holding time compliance; presence or absence of laboratory contamination as demonstrated by method and trip blanks; laboratory control samples (LCS), and matrix spike (MS) samples; surrogate recoveries; analytical precision as the relative percent (%) difference between replicate sample results (i.e., laboratory and field duplicates) or MS and matrix spike duplicates (MSD). This data validation did not include a review of the raw analytical data.

Groundwater samples were analyzed for ethylbenzene and SVOCs and were evaluated for the following:

- 1. Preservation and Holding Times Acceptable
- 2. Blanks Acceptable, except noted below:
  - SVOCs: Bis(2-ethylhexyl) phthalate was detected at a concentration of 0.15 micrograms per liter (μg/L) in the method blank associated with the analysis of samples SBW-05-0418-17, SBW-08-041817, SBW-07-041817, ATT 06-041817, ATT 05-041817,

ATT 10-041817, ATT 01-041817, ATT 02-041817, ATT 03-041817, ATT 04-041817, PMW 07-041817, ATT 12-041817, ATT 11-041817, and DUP-041817.

Bis(2-ethylhexyl)phthalate either was not detected or was detected at concentrations greater than five times the blank concentration in samples SBW-08-041817, ATT 06-041817, ATT 04 041817, and ATT 12-041817. Amec Foster Wheeler U qualified the bis(2-ethylhexyl)phthalate results from samples SBW-05-0418-17, SBW-07-041817, ATT 05-041817, ATT 10-041817, ATT 01-041817, ATT 02-041817, ATT 03-041817, PMW 07-041817, ATT 11-041817, and DUP-041817 at the higher o the detected concentration or the reporting limit because the concentrations detected in the samples were less than five times the concentration detected in the blank. (U-MB)

- 3. Surrogates Acceptable, except as noted below:
  - SVOCs: Recoveries of the surrogate compound terphenyl-d14 were high in samples SBW-07-041817 (115%), ATT 10-041817 (112%), and PMW-07-041817 (113%). Up to one surrogate from each fraction may be outside of laboratory-specified limits without adversely affecting data usability, and Amec Foster Wheeler did not qualify any data based on the high surrogate recoveries.
- 4. LCS/LCSD Acceptable
- 5. MS/MSD Acceptable.
- 6. Field Duplicates Acceptable, except as noted below:

Primary and duplicate results are summarized in Table 2. The project-specific control limit for field duplicate relative percent differences (RPD) is 20 percent for concentrations greater than five times the reporting limit. The RPD is not calculated unless the analyte is detected in both the primary and field duplicate. If an analyte is detected in one sample but not the other the RPD is not calculable as indicated on the table below by "NC." If the 20% RPD criterion is exceeded or an analyte is detected in only one sample the secondary criterion for evaluating field duplicate precision is that the absolute value of the difference between the primary and duplicate results should not exceed the value of the reporting limit. As shown in the table below, RPDs were acceptable.

The difference between bis(2-ethylhexyl) phthalate results was greater than the reporting limit of 0.99 micrograms per liter (µg/L). Amec Foster Wheeler J/UJ qualified the bis(2-ethylhexyl) phthalate results in the primary and duplicate samples as estimated because of potential sampling or analytical imprecision. (J/UJ-FD).

Table 2: Field Duplicate Detections

Sample ID/	Analyte	Primary Result	Duplicate Result	RL	RPD
Field Duplicate ID	•	(µg/L)	(µg/L)	(µg/L)	%
ATT 06-041817 and	benzoic acid	2.9 J	2.6 J	5.0	11
DUP-041817	naphthalene	180 D	190 D	4.0	5
	dibenzofuran	5.0	5.0	0.20	NC
	fluorene	13	13	0.20	NC
	phenanthrene	7.1	6.6	0.20	7
	fluoranthene	0.051 J	0.048 J	0.20	6
	bis(2-ethylhexyl) phthalate	2.2	0.99 U	0.99	NC
	ethylbenzene	7.9	12	0.50	47%

Notes: J = estimated value NC = not calculated

D = dilution

7. Reporting Limits and Laboratory Flags – Acceptable except as noted:

ALS J qualified results with concentrations between the method detection limit (MDL) and the reporting limit (RL). Amec Foster Wheeler agrees that these results are quantitatively uncertain and has maintained ALS's J qualifiers. (J-DL)

#### OVERALL ASSESSMENT OF DATA

The completeness of the samples reviewed above and included in ALS SDG K1612609 is 100%. Few quality control issues were identified, and analytical performance was generally within specified limits. Results are usable for all purposes, as qualified. A summary of qualified results is presented in Table 3.

Table 3: Qualified Results

		Qualified	
Sample ID	Qualified Analyte	Result	Qualifier Reason
SBW-05-041817	Benzoic Acid	2.7 J	DL
	Phenanthrene	0.057 J	DL
	Bis(2-ethylhexyl) phthalate	1.0 U	MB
	Ethylbenzene	0.49 J	DL
SBW-08-041817	Benzoic Acid	2.9 J	DL
	Dibenzofuran	0.087 J	DL
	Bis(2-ethylhexyl) phthalate	0.76 J	DL
	Ethylbenzene	0.060 J	DL
SBW-07-041817	Benzoic Acid	2.5 J	DL
	Bis(2-ethylhexyl) phthalate	0.95 U	MB
ATT06-041817	Fluoranthene	0.051 J	DL
711100 011011	Bis (2-ethylhexyl) phthalate	2.2 J	FD
	Ethylbenzene	7.9 J	FD
ATT05-041817	Fluoranthene	0.024 J	DL
	Bis(2-ethylhexyl) phthalate	0.97 U	MB
ATT10-041817	Dibenzofuran	0.098 J	DL

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		Qualified	
Sample ID	Qualified Analyte	Result	Qualifier Reason
	Bis(2-ethylhexyl) phthalate	1.0 U	MB
	Ethylbenzene	0.050 J	DL
ATT01-041817	Phenanthrene	0.050 J	DL
	Bis(2-ethylhexyl) phthalate	0.99 U	MB
ATT02-041817	Benzoic Acid	2.9 J	DL
	Bis(2-ethylhexyl) phthalate	1.0 U	MB
ATT03-041817	Benzoic Acid	2.6 J	DL
	Naphthalene	0.087 J	DL
	Fluorene	0.029 J	DL
	Bis(2-ethylhexyl) phthalate	1.0 U	MB
ATT04-041817	Benzoic Acid	2.6 J	DL
PMW07-041817	Benzoic Acid	2.5 J	DL
	Bis(2-ethylhexyl) phthalate	1.0 U	MB
ATT12-041817	Benzoic Acid	2.6 J	DL
	Naphthalene	0.026 J	DL
ATT11-041817	Benzoic Acid	2.5 J	DL
	Bis(2-ethylhexyl) phthalate	0.99 U	MB
DUP-041817	Benzoic Acid	2.6 J	DL
	Fluoranthene	0.048 J	DL
	Bis(2-ethylhexyl) phthalate	0.99 UJ	MB, FD
	Ethylbenzene	12 J	FD
Trip Blank	none		

Notes: DL = Detected result is between the MDL and RL.

FD = Field duplicate imprecision MB = Method blank contamination

### **REFERENCES**

EPA (US Environmental Protection Agency), 2014, U.S. EPA National Functional Guidelines for Superfund Organic Methods Data Review: EPA 540-R-014-002, August.

EPA, 2009. Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use, EPA-540-R-08-005.

AMEC, 2010. Operation, Monitoring, Inspection, and Maintenance Plan - Former Koppers Wood Treating Site - Wauna, Oregon: February 2010, Project 9151.011