August 21, 2018

Ms. Sunny Becker
Washington State Department of Ecology
3190 160th Avenue SE
Bellevue, WA 98008-5452

Subject: Second Quarter 2018 Progress Report, Southwest Harbor Project Remediation Areas 1, 2, 3, and 5
Ecology Facility/Site Numbers 2384, 2385, 2127, and 2383

Dear Sunny:

This letter contains the combined quarterly progress report for the Ecology-lead portions of the Southwest Harbor Project (SWHP) for remediation areas (RAs) 1, 2, 3, and 5 and covers April, May, and June 2018. This report satisfies the reporting requirement stipulated in the consent decrees for these sites as modified by the Port's November 15, 2016 letter to Ecology and subsequent communication from Ecology to the Port on December 2, 2016, and June 30, 2017 (see previous Progress Reports for additional details).

A. List of on-site activities that have taken place during the quarter.

Biweekly Landfill Monitoring:

No methane was detected from the sampling points located along Harbor Avenue SW during the reporting period, confirming that methane is not migrating off-site to the west since the blower has been shut down.

Methane concentrations measured at sampling ports SP-12 and SP-13 continued to exhibit levels above the lower explosive limit (LEL) of five percent. These two sampling ports are located outside the consolidated landfill area but within the geomembrane-capped footprint of the former landfill where waste is still present. The elevated methane levels observed in SP-12 and SP-13 may reflect continued gas generation from waste in this area. Sampling ports SP-12 and SP-13 are located in a railyard within a limited access, open-air industrial area. The nearest building (maintenance facility) is approximately 400 feet away and outside the geomembrane-capped portion of the former landfill.

A vicinity map showing the landfill relative to nearby structures is included as Figure 1; a site map showing the extent of the consolidated landfill, extent of the former landfill area, sampling probe/port locations, and the extent of the landfill cap is included as Figure 2; a representative schematic cross section of typical landfill cap construction is included as Figure 3; and a map showing methane concentrations since September 2017 is included as Figure 4.

The second quarter monitoring results are discussed further in Attachment 1 and monitoring results are presented in Attachment 2.

We will reevaluate the monitoring results and make recommendations as necessary in the next quarterly monitoring report.

Semiannual Inspection: The semiannual inspection of site pavement caps, drainage, ballast cover areas, fencing, and warning signs was conducted on June 27, 2018 (Attachment 3).

The next semiannual inspection is scheduled for the fourth quarter of 2018.

B. Detailed description of any deviations from the required tasks not otherwise documented in project plans or amendment requests.

There have been no deviations during the past quarter.

C. Description of all deviations from the schedule during the current quarter and any planned deviations in the upcoming quarter.

One monitoring event was completed during May 2018 due to scheduling issues – although the event was made up on June 1, 2018 – making it three monitoring events during the month of June. No deviations are planned in the upcoming quarter.

D. For any deviations in schedule, a plan for recovering lost time and maintaining compliance with the schedule.

No deviations are anticipated.

E. All raw data (including laboratory reports) received by the Port during the past quarter and an identification of the source of the sample.

No raw laboratory data was received during this quarter.

F. A list of deliverables and activities for the upcoming quarter.

We plan to install four soil vapor probes to further delineate the extent of methane gas within the subsurface originating from the former landfill. We propose the installation of soil vapor probes on the south, east, and north boundaries of the former landfill footprint. Proposed soil vapor probe locations are shown on Figure 5. The field work is currently being coordinated and scheduled by Hart Crowser.

The next routine deliverable will be a letter summarizing the monitoring performed during the third quarter of 2018, and will be titled, Third Quarter 2018 Progress Report, Remediation Areas 1, 2, 3, and 5. This progress report will summarize our updated monitoring plan per Ecology's request. As requested in your email dated June 30, 2017, all sampling ports, including any newly installed sampling ports, will be included in the monitoring plan and biweekly monitoring will continue until monitoring results indicate stable methane concentrations.

The next semiannual inspection of site pavement caps, drainage, ballast cover areas, fencing, and warning signs is scheduled for the fourth quarter of 2018.

Please contact me at (206) 787-3193 if you have any questions or comments about our activities at the SWHP site.

Sincerely,

Brick Spangler
Sr. Environmental Program Manager

Attachments:
Figure 1 – Vicinity Map Showing Nearby Structures
Figure 2 – Site Plan
Figure 3 – Cap Schematic Cross Section
Figure 4 – Methane Monitoring Results
Figure 5 – Site Plan with Proposed Soil Vapor Probe Locations
Attachment 1 – Terminal 5 Landfill Gas Collection and Treatment System Monitoring Results Memorandum – Second Quarter 2018
Attachment 2 – Terminal 5 Landfill Gas Collection and Treatment System Monthly Monitoring Results Tables – Second Quarter 2018
Attachment 3 – Semiannual Inspection of T-5 Ecology- lead Sites: 2018 Mid-Year Inspection – Second Quarter 2018

cc: Warren Hansen – Windward Environmental, LLC
Mark Dagel – Hart Crowser, Inc.

Legend

Approximate Geomembrane Limits

0 250 500 1,000 Feet

N

Port of Seattle, Southwest Harbor Terminal 5
Seattle, Washington

Vicinity Map Showing Nearby Structures

17627-05 1/18

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Figure 1

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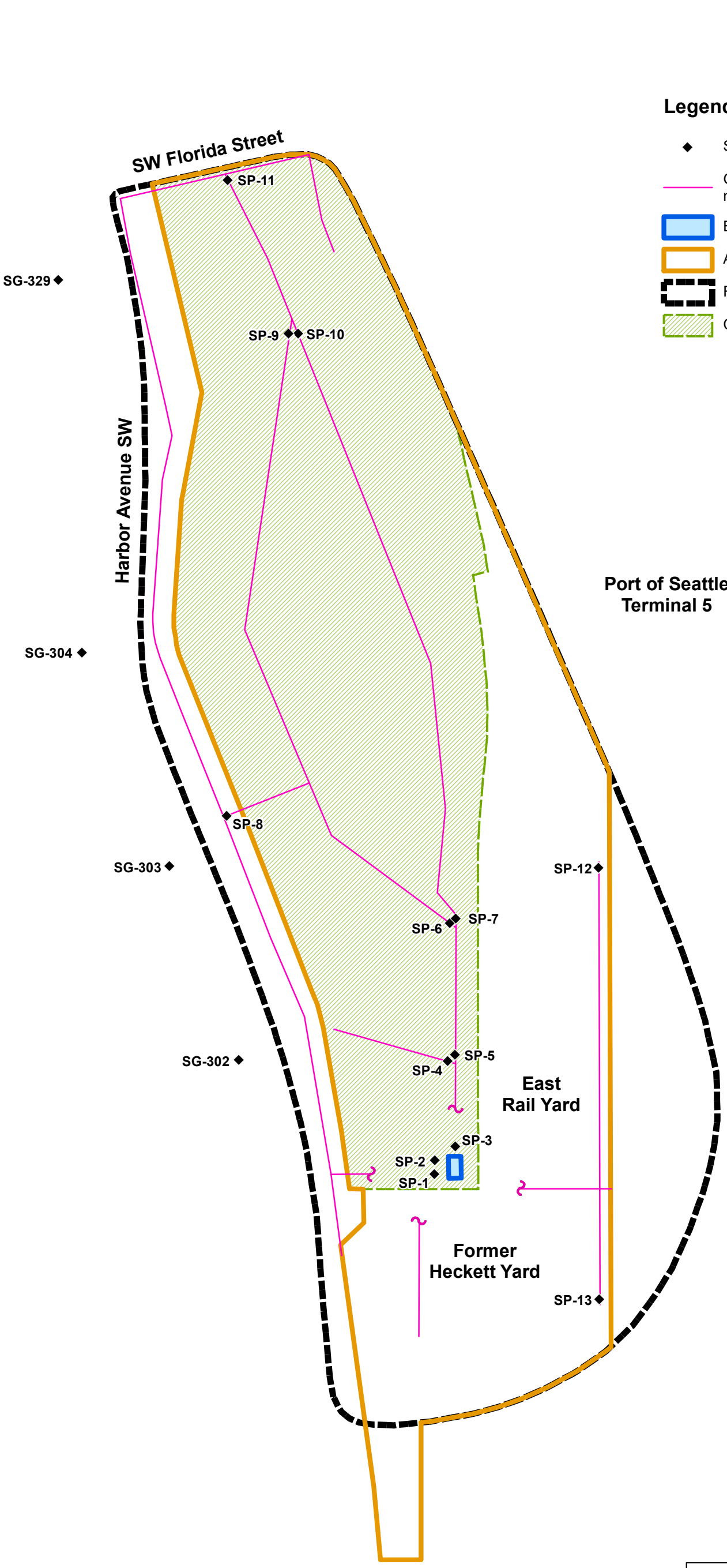

Port of Seattle, Southwest Harbor Terminal 5
Seattle, Washington

Site Plan

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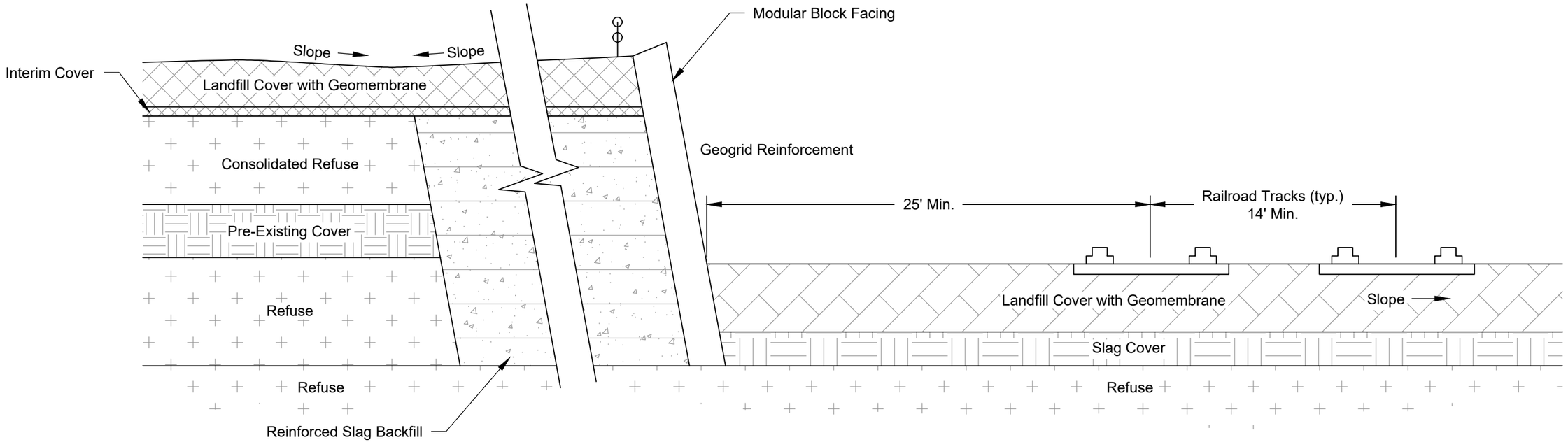
Figure
2

West

East



0 6 12

Approximate Scale in Feet

Sources: Figure prepared from PDF "Cross Section - Final Landfill Cover System," created by Woodward-Clyde Consultants, dated 2/21/95.

Port of Seattle, Southwest Harbor Terminal 5
Seattle, Washington

Cap Schematic Cross Section

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Figure
3

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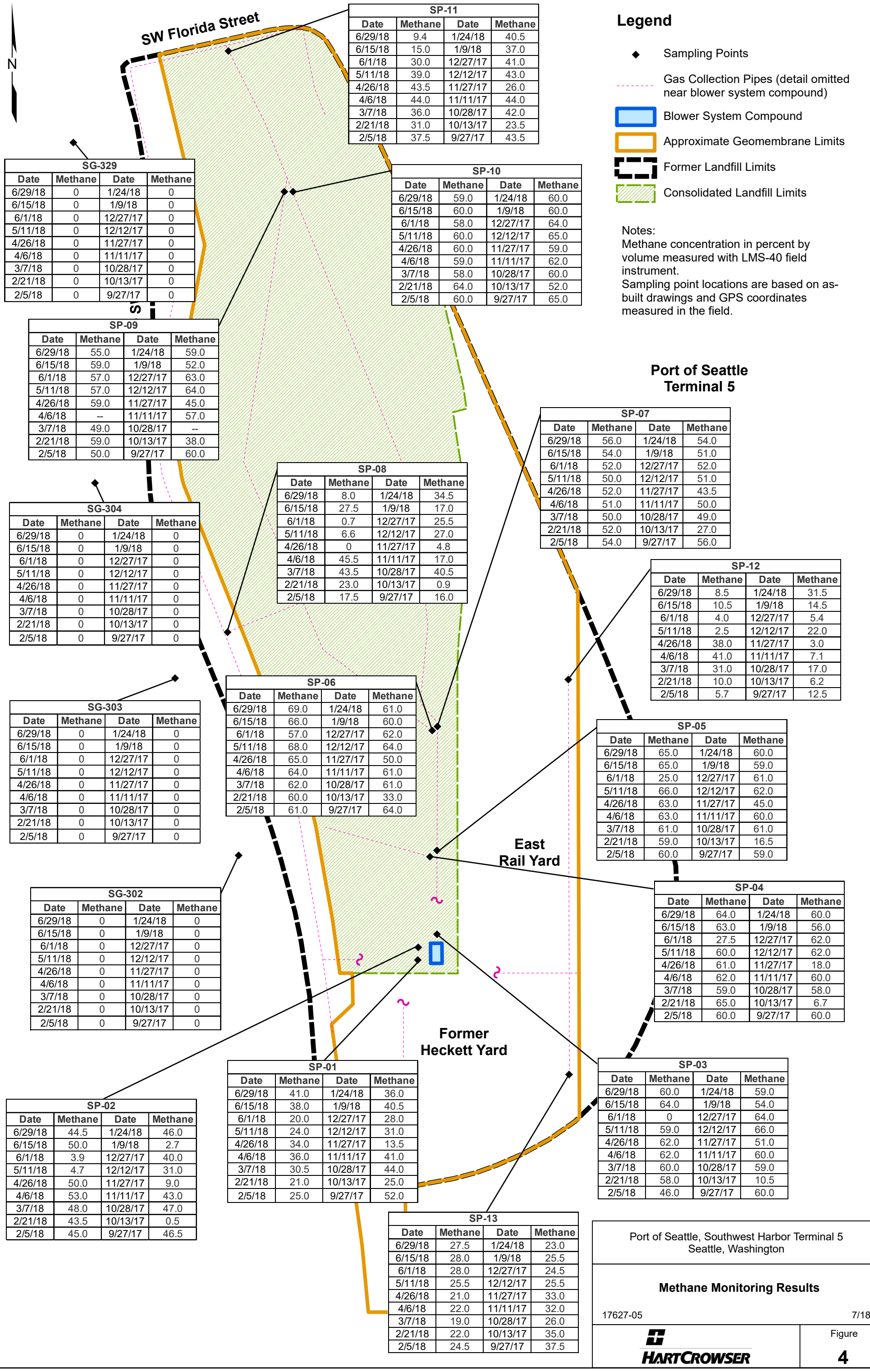

SP-11			
Date	Methane	Date	Methane
6/29/18	9.4	1/24/18	40.5
6/15/18	15.0	1/9/18	37.0
6/1/18	30.0	12/27/17	41.0
5/11/18	39.0	12/12/17	43.0
4/26/18	43.5	11/27/17	26.0
4/6/18	44.0	11/11/17	44.0
3/7/18	36.0	10/28/17	42.0
2/21/18	31.0	10/13/17	23.5
2/5/18	37.5	9/27/17	43.5

SG-329			
Date	Methane	Date	Methane
6/29/18	0	1/24/18	0
6/15/18	0	1/9/18	0
6/1/18	0	12/27/17	0
5/11/18	0	12/12/17	0
4/26/18	0	11/27/17	0
4/6/18	0	11/11/17	0
3/7/18	0	10/28/17	0
2/21/18	0	10/13/17	0
2/5/18	0	9/27/17	0

SP-10			
Date	Methane	Date	Methane
6/29/18	59.0	1/24/18	60.0
6/15/18	60.0	1/9/18	60.0
6/1/18	58.0	12/27/17	64.0
5/11/18	60.0	12/12/17	65.0
4/26/18	60.0	11/27/17	59.0
4/6/18	59.0	11/11/17	62.0
3/7/18	58.0	10/28/17	60.0
2/21/18	64.0	10/13/17	52.0
2/5/18	60.0	9/27/17	65.0

SP-09			
Date	Methane	Date	Methane
6/29/18	55.0	1/24/18	59.0
6/15/18	59.0	1/9/18	52.0
6/1/18	57.0	12/27/17	63.0
5/11/18	57.0	12/12/17	64.0
4/26/18	59.0	11/27/17	45.0
4/6/18	--	11/11/17	57.0
3/7/18	49.0	10/28/17	--
2/21/18	59.0	10/13/17	38.0
2/5/18	50.0	9/27/17	60.0

SP-07			
Date	Methane	Date	Methane
6/29/18	56.0	1/24/18	54.0
6/15/18	54.0	1/9/18	51.0
6/1/18	52.0	12/27/17	52.0
5/11/18	50.0	12/12/17	51.0
4/26/18	52.0	11/27/17	43.5
4/6/18	51.0	11/11/17	50.0
3/7/18	50.0	10/28/17	49.0
2/21/18	52.0	10/13/17	27.0
2/5/18	54.0	9/27/17	56.0

SP-08			
Date	Methane	Date	Methane
6/29/18	8.0	1/24/18	34.5
6/15/18	27.5	1/9/18	17.0
6/1/18	0.7	12/27/17	25.5
5/11/18	6.6	12/12/17	27.0
4/26/18	0	11/27/17	4.8
4/6/18	45.5	11/11/17	17.0
3/7/18	43.5	10/28/17	40.5
2/21/18	23.0	10/13/17	0.9
2/5/18	17.5	9/27/17	16.0

SG-304			
Date	Methane	Date	Methane
6/29/18	0	1/24/18	0
6/15/18	0	1/9/18	0
6/1/18	0	12/27/17	0
5/11/18	0	12/12/17	0
4/26/18	0	11/27/17	0
4/6/18	0	11/11/17	0
3/7/18	0	10/28/17	0
2/21/18	0	10/13/17	0
2/5/18	0	9/27/17	0

SP-12			
Date	Methane	Date	Methane
6/29/18	8.5	1/24/18	31.5
6/15/18	10.5	1/9/18	14.5
6/1/18	4.0	12/27/17	5.4
5/11/18	2.5	12/12/17	22.0
4/26/18	38.0	11/27/17	3.0
4/6/18	41.0	11/11/17	7.1
3/7/18	31.0	10/28/17	17.0
2/21/18	10.0	10/13/17	6.2
2/5/18	5.7	9/27/17	12.5

SG-303			
Date	Methane	Date	Methane
6/29/18	0	1/24/18	0
6/15/18	0	1/9/18	0
6/1/18	0	12/27/17	0
5/11/18	0	12/12/17	0
4/26/18	0	11/27/17	0
4/6/18	0	11/11/17	0
3/7/18	0	10/28/17	0
2/21/18	0	10/13/17	0
2/5/18	0	9/27/17	0

SP-06			
Date	Methane	Date	Methane
6/29/18	69.0	1/24/18	61.0
6/15/18	66.0	1/9/18	60.0
6/1/18	57.0	12/27/17	62.0
5/11/18	68.0	12/12/17	64.0
4/26/18	65.0	11/27/17	50.0
4/6/18	64.0	11/11/17	61.0
3/7/18	62.0	10/28/17	61.0
2/21/18	60.0	10/13/17	33.0
2/5/18	61.0	9/27/17	64.0

SP-05			
Date	Methane	Date	Methane
6/29/18	65.0	1/24/18	60.0
6/15/18	65.0	1/9/18	59.0
6/1/18	25.0	12/27/17	61.0
5/11/18	66.0	12/12/17	62.0
4/26/18	63.0	11/27/17	45.0
4/6/18	63.0	11/11/17	60.0
3/7/18	61.0	10/28/17	61.0
2/21/18	59.0	10/13/17	16.5
2/5/18	60.0	9/27/17	59.0

SG-302			
Date	Methane	Date	Methane
6/29/18	0	1/24/18	0
6/15/18	0	1/9/18	0
6/1/18	0	12/27/17	0
5/11/18	0	12/12/17	0
4/26/18	0	11/27/17	0
4/6/18	0	11/11/17	0
3/7/18	0	10/28/17	0
2/21/18	0	10/13/17	0
2/5/18	0	9/27/17	0

SP-04			
Date	Methane	Date	Methane
6/29/18	64.0	1/24/18	60.0
6/15/18	63.0	1/9/18	56.0
6/1/18	27.5	12/27/17	62.0
5/11/18	60.0	12/12/17	62.0
4/26/18	61.0	11/27/17	18.0
4/6/18	62.0	11/11/17	60.0
3/7/18	59.0	10/28/17	58.0
2/21/18	65.0	10/13/17	6.7
2/5/18	60.0	9/27/17	60.0

SP-01			
Date	Methane	Date	Methane
6/29/18	41.0	1/24/18	36.0
6/15/18	38.0	1/9/18	40.5
6/1/18	20.0	12/27/17	28.0
5/11/18	24.0	12/12/17	31.0
4/26/18	34.0	11/27/17	13.5
4/6/18	36.0	11/11/17	41.0
3/7/18	30.5	10/28/17	44.0
2/21/18	21.0	10/13/17	25.0
2/5/18	25.0	9/27/17	52.0

SP-03			
Date	Methane	Date	Methane
6/29/18	60.0	1/24/18	59.0
6/15/18	64.0	1/9/18	54.0
6/1/18	0	12/27/17	64.0
5/11/18	59.0	12/12/17	66.0
4/26/18	62.0	11/27/17	51.0
4/6/18	62.0	11/11/17	60.0
3/7/18	60.0	10/28/17	59.0
2/21/18	58.0	10/13/17	10.5
2/5/18	46.0	9/27/17	60.0

SP-02			
Date	Methane	Date	Methane
6/29/18	44.5	1/24/18	46.0
6/15/18	50.0	1/9/18	2.7
6/1/18	3.9	12/27/17	40.0
5/11/18	4.7	12/12/17	31.0
4/26/18	50.0	11/27/17	9.0
4/6/18	53.0	11/11/17	43.0
3/7/18	48.0	10/28/17	47.0
2/21/18	43.5	10/13/17	0.5
2/5/18	45.0	9/27/17	46.5

SP-13			
Date	Methane	Date	Methane
6/29/18	27.5	1/24/18	23.0
6/15/18	28.0	1/9/18	25.5
6/1/18	28.0	12/27/17	24.5
5/11/18	25.5	12/12/17	25.5
4/26/18	21.0	11/27/17	33.0
4/6/18	22.0	11/11/17	32.0
3/7/18	19.0	10/28/17	26.0
2/21/18	22.0	10/13/17	35.0
2/5/18	24.5	9/27/17	37.5

Port of Seattle, Southwest Harbor Terminal 5
Seattle, Washington

Methane Monitoring Results

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Figure 4

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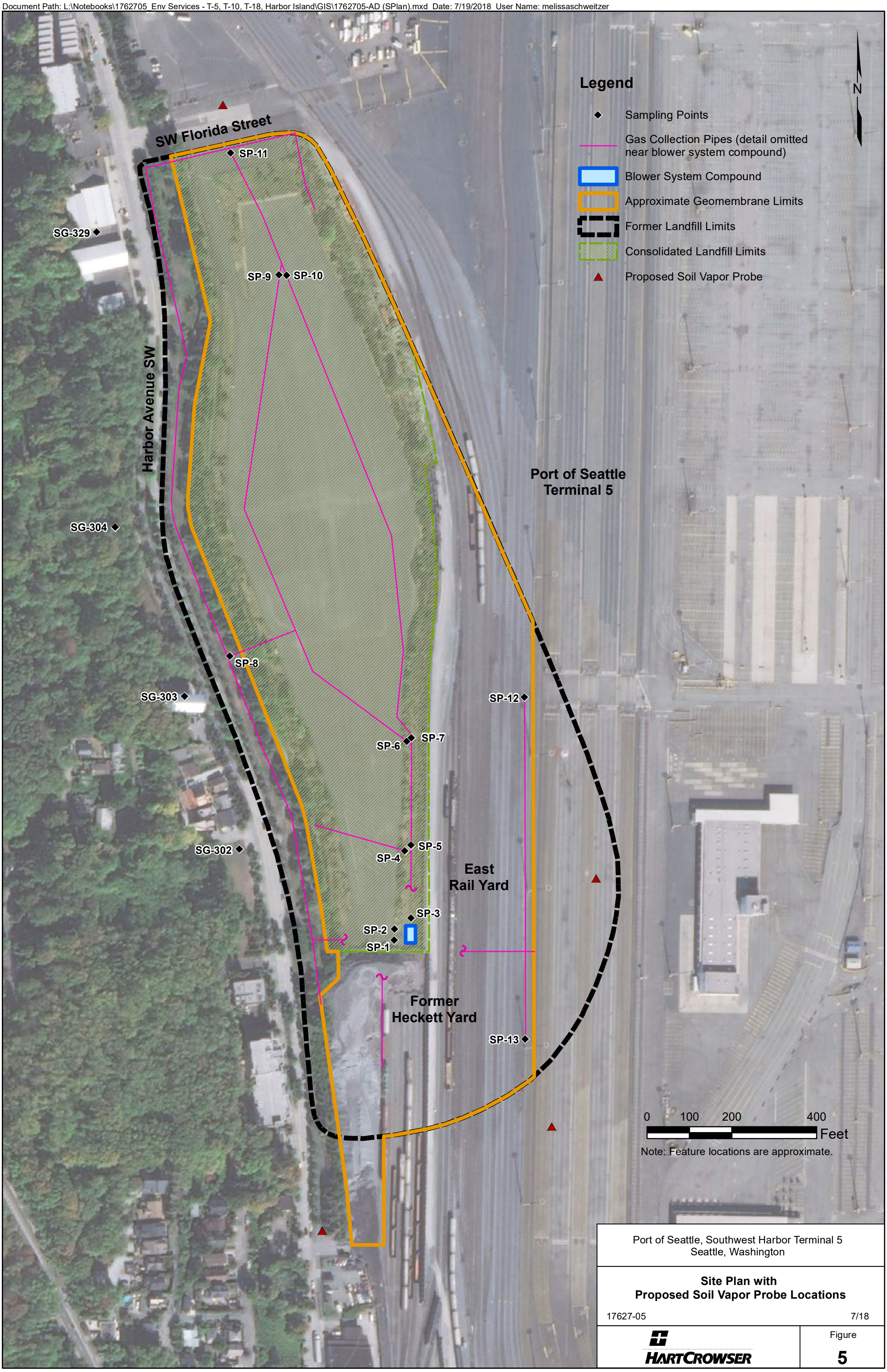

Port of Seattle, Southwest Harbor Terminal 5
Seattle, Washington

Site Plan with
Proposed Soil Vapor Probe Locations

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Figure
5

ATTACHMENT 1

Terminal 5 Landfill Gas Collection and Treatment System

Monitoring Results Memorandum

Second Quarter 2018

MEMORANDUM

DATE: August 21, 2018

TO: Brick Spangler, Port of Seattle

FROM: Jamalyn Green and Mark Dagel, Hart Crowser

RE: **Terminal 5 Landfill Gas Collection System Monitoring Results**
Second Quarter 2018
17627-05

This memorandum presents the results of the second quarter of 2018 monitoring at the Terminal 5 (T-5) Remediation Area 3 landfill gas collection system. This quarter's report includes biweekly monitoring from April through June 2018. Gas concentrations were measured in the field using a LMS-40 gas analyzer. The landfill gas collection system was converted to a passive system in December 2016 by replumbing the system discharge piping to bypass the blower and shutting the blower off.

Monitoring was performed at the following locations:

- System effluent sampling port BV-1.
- System sampling ports SP-01 through SP-13.
- Off-site soil gas probes SG-302, SG-303, SG-304, and SG-329.

Monitoring locations are shown on Figure 2. Results are presented in Attachment 2 and summarized below.

Effluent Sampling Port Results

Effluent sample port BV-1 is located within the system manifold and represents the vapor concentrations that are exiting the system via the discharge stack. Methane concentrations during this quarter ranged from non-detect to 59 percent. Carbon dioxide concentrations ranged from non-detect to 9.5 percent. Oxygen concentrations ranged from non-detect to 20.9 percent.

Additional parameters measured within the system manifold were vapor temperature and flow rate. Temperature was measured at in-line temperature gage T-1 and averaged 64°F; consistent with normal ambient subsurface conditions for this time of year. Flow rate was monitored at flow meter F1, located between BV-1 and the condensate drum. The meter indicated a flow rate of non-detect to 0.5 standard cubic feet per minute (SCFM); however, the existing meter was originally installed to measure the higher

flow rates in an active system and is not sensitive enough to detect the low flow rates in the current passive system.

Collection System Sampling Port Results

Sampling Ports SP-01 though SP-13 allow vapor samples to be collected from various locations within the underground gas collection piping system (Figure 2). SP-12 and SP-13 are located in the easternmost arm of the collection system, which is currently valved off from the rest of the system.

During this quarter, methane concentrations ranged from non-detect to 69 percent, carbon dioxide concentrations ranged from non-detect to 21 percent, and oxygen concentrations ranged from non-detect to 21 percent.

Below is a table listing the occurrences of elevated oxygen levels (compared with previous quarters) accompanied by a comparably lower concentration of methane.

Occurrences of Elevated Oxygen Levels in Sampling Ports

Monitoring Location	Date	Oxygen	Methane
SP-02	5/11/18	17.8	4.7
	6/1/18	18.7	3.9
SP-03	6/1/18	21.1	0
SP-08	4/26/18	16.5	0
	6/1/18	12.9	0.7
SP-11	6/15/18	13.0	15.0
	6/29/18	15.7	9.4

Notes:

a. Parameter measurements units are percent by volume.

Temperature within the each of the sampling ports was measured with an infrared thermometer and values ranged from 58° to 89°F.

Off-Site Soil Gas Probe Results

Off-site soil gas probes SG-302, SG-303, SG-304, and SG-329 are located to the west of the landfill along Harbor Avenue. As in previous quarters, no methane was detected at these probes. Carbon dioxide concentrations ranged from 0.1 to 2.9 percent and oxygen concentrations ranged from 13.5 to 20.4 percent.

System Maintenance and Other Notes

- Port real estate division to issued new consultant specific key code.
- We will re-open the valve that connects the easternmost arm of the collection system (where SP-12 and SP-13 are located) to the rest of the system. That arm had been temporarily valved off to assess subsurface gas concentrations in eastern part of the landfill.

Trend Analysis

Since conversion to a passive system, methane and oxygen concentrations throughout the collection piping (SP-01 to SP-13) have shown similar trends. Methane concentrations increased markedly upon conversion to passive operation and, since then, have remained within the typical phase IV landfill decomposition range with month-to-month variation. Oxygen concentrations generally dropped to very low to non-detect levels following conversion to passive operation and have remained low but interspersed with occasional spikes in some sampling ports.

We plan to continue bi-weekly monitoring of the system. Our next report will cover the third quarter of 2018. Please feel free to contact us with any questions or concerns.

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ATTACHMENT 2

Terminal 5 Landfill Gas Collection and Treatment System

Monthly Monitoring Results Tables

Second Quarter 2018

Terminal 5 / RA-3 Landfill Gas Treatment System

Monitoring Results December 2016 - June 2018

Parameter: TEMPERATURE
degrees Fahrenheit (est.)

Date	Monitoring Location												
	SP-01	SP-02	SP-03	SP-04	SP-05	SP-06	SP-07	SP-08	SP-09	SP-10	SP-11	SP-12	SP-13
29-Jun-18	73	79	74	83	68	72	70	65	82	77	76	65	68
15-Jun-18	74.7	81.3	85.3	69.8	81.4	71.6	71.7	73.7	89.0	71.3	71.8	70.5	71.0
01-Jun-18	67.9	73.7	72.3	66.0	66.0	65.6	64.9	66.2	60.9	70.0	65.0	70.3	70.0
11-May-18	66.0	70.3	68.7	62.9	63.1	62.6	60.7	73.9	67.0	66.2	69.4	64.2	66.2
26-Apr-18	60	69	69	64	65	71	78	74	82	80	78	72	78
06-Apr-18	64	65	63	63	58	60	59	63	--	73	69	65	63
07-Mar-18	53	55	54	59	59	51	55	56	51	51	58	51	59
21-Feb-18	52	53	51	52	56	56	49	50	49	51	50	50	51
05-Feb-18	58	59	59	60	59	60	59	59	61	58	58	51	58
24-Jan-18	55	56	51	58	51	58	56	58	53	53	53	54	54
09-Jan-18	55	55	52	59	54	51	56	58	54	54	55	51	55
27-Dec-17	51	50	52	53	53	53	53	48	50	50	50	49	49
12-Dec-17	46	54	49	51	49	48	53	54	57	52	50	47	48
27-Nov-17	48	61	53	63	60	60	60	61	51	56	58	53	51
11-Nov-17	58	48	51	58	61	60	59	61	54	56	58	58	58
28-Oct-17	65	61	61	67	69	70	55	58	--	62	72	66	63
13-Oct-17	69	71	67	69	61	62	62	68	59	63	61	63	60
27-Sep-17	75	82	75	75	72	73	71	74	72	73	75	73	73
16-Sep-17	78	88	80	78	71	80	78	78	82	82	86	78	82
30-Aug-17	82	86	85	81	80	80	86	73	83	80	81	82	81
17-Aug-17	80	83	88	84	80	83	83	71	84	89	80	81	81
24-Jul-17	85	82	85	80	80	86	80	83	88	85	85	79	79
10-Jul-17	86	89	89	71	78	81	80	75	81	80	85	86	81
01-Jun-17	--	--	--	--	--	--	--	--	--	--	--	71	82
09-May-17	--	--	--	--	--	--	--	--	--	--	--	81	80
11-Apr-17	--	--	--	--	--	--	--	--	--	--	--	54	55
08-Mar-17	--	--	--	--	--	--	--	--	--	--	--	51	50
21-Feb-17	--	--	--	--	--	--	--	--	--	--	--	60	56
07-Feb-17	--	--	--	--	--	--	--	--	--	--	--	45	46
23-Jan-17	--	--	--	--	--	--	--	--	--	--	--	51	57
05-Jan-17	--	--	--	--	--	--	--	--	--	--	--	45	44
16-Dec-16	51	51	56	58	51	60	61	52	51	49	50	51	51
# Readings	***24***	***24***	***24***	***24***	***24***	***24***	***24***	***24***	***22***	***24***	***24***	***32***	***32***
Min. value	***46***	***48***	***49***	***51***	***49***	***48***	***49***	***48***	***49***	***49***	***50***	***45***	***44***
Max. value	***86***	***89***	***89***	***84***	***81***	***86***	***86***	***83***	***89***	***89***	***86***	***86***	***82***
AVERAGE	***65***	***68***	***66***	***66***	***64***	***66***	***65***	***65***	***66***	***66***	***66***	***62***	***63***
Location	*SP-01*	*SP-02*	*SP-03*	*SP-04*	*SP-05*	*SP-06*	*SP-07*	*SP-08*	*SP-09*	*SP-10*	*SP-11*	*SP-12*	*SP-13*

Terminal 5 / RA-3 Landfill Gas Treatment System

Monitoring Results December 2016 - June 2018

Parameter: PRESSURE (negative)
(Gauge - inches of water.)

	Monitoring Location																
Date	SG-302	SG-303	SG-304	SG-329	SP-01	SP-02	SP-03	SP-04	SP-05	SP-06	SP-07	SP-08	SP-09	SP-10	SP-11	SP-12	SP-13
29-Jun-18	0	0	0	0	0	0	0	0	0	0	0	0	0.06	0	0	0	0
15-Jun-18	0	0	0	0	0	0	0	0	0	0	0	0.05	0	0	0	0	0
01-Jun-18	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0.001
11-May-18	0	0	0	0	0	1.41	0.43	0	0	0	0	0	0	0	0	0	0
26-Apr-18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06-Apr-18	0	0	0	0	0	0	0	0	0	0	0	0	--	0	0	0	0
07-Mar-18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21-Feb-18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05-Feb-18	0	0	1.0	0	0	0	0.08	0	0	0	0	0	0	0	0	0	0
24-Jan-18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09-Jan-18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27-Dec-17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12-Dec-17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27-Nov-17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11-Nov-17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28-Oct-17	0	0	0	0	0.02	0.01	0	0	0	0	0	0	--	0	0	0	0
13-Oct-17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27-Sep-17	0	0	0	0	0.02	0	0	0	0	0	0	0	0	0.04	0.02	0.04	0
16-Sep-17	0	0	0	0	0.02	0.01	0	0	0	0.02	0.02	0	0.02	0.01	0.01	0	0
30-Aug-17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17-Aug-17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24-Jul-17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10-Jul-17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08-Jun-17	0	0	0	0	--	--	--	--	--	--	--	--	--	--	--	0	0
09-May-17	0	0	0	0	--	--	--	--	--	--	--	--	--	--	--	0	0
11-Apr-17	0	0	0	0	--	--	--	--	--	--	--	--	--	--	--	0	0
08-Mar-17	0	0	0	0	--	--	--	--	--	--	--	--	--	--	--	0	0
21-Feb-17	0	0	0	0	--	--	--	--	--	--	--	--	--	--	--	0	0
07-Feb-17	0	0	0	0	--	--	--	--	--	--	--	--	--	--	--	0	0
23-Jan-17	0	0	0	0	--	--	--	--	--	--	--	--	--	--	--	0	0
05-Jan-17	0	0	0	0	--	--	--	--	--	--	--	--	--	--	--	0	0
16-Dec-16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
# Readings	32	32	32	32	24	24	24	24	24	24	24	24	22	24	24	32	32
Min. value	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Max. value	0	0	1	0	0.02	1.41	0.43	0.00	0.00	0.02	0.02	0.05	0.06	0.04	0.02	0	0.00
AVERAGE	**0**	**0**	**0**	**0**	**0.00**	**0.06**	**0.03**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0**	**0**	**0.00**
Location	SG-302	SG-303	SG-304	SG-329	SP-01	SP-02	SP-03	SP-04	SP-05	SP-06	SP-07	SP-08	SP-09	SP-10	SP-11	SP-12	SP-13

Terminal 5 / RA-3 Landfill Gas Treatment System

Monitoring Results December 2016 - June 2018

Parameter: METHANE
(LMS-40 instrument field measurement - percent by volume.)

	Monitoring Location																
Date	*SG-302*	*SG-303*	*SG-304*	*SG-329*	*SP-01*	*SP-02*	*SP-03*	*SP-04*	*SP-05*	*SP-06*	*SP-07*	*SP-08*	*SP-09*	*SP-10*	*SP-11*	*SP-12*	*SP-13*
29-Jun-18	0	0	0	0	41.0	44.5	60.0	64.0	65.0	69.0	56.0	8.0	55.0	59.0	9.4	8.5	27.5
15-Jun-18	0	0	0	0	38.0	50.0	64.0	63.0	65.0	66.0	54.0	27.5	59.0	60.0	15.0	10.5	28.0
01-Jun-18	0	0	0	0	20.0	3.9	0	27.5	25.0	57.0	52.0	0.7	57.0	58.0	30.0	4.0	28.0
11-May-18	0	0	0	0	24.0	4.7	59.0	60.0	66.0	68.0	50.0	6.6	57.0	60.0	39.0	2.5	25.5
26-Apr-18	0	0	0	0	34.0	50.0	62.0	61.0	63.0	65.0	52.0	0	59.0	60.0	43.5	38.0	21.0
06-Apr-18	0	0	0	0	36.0	53.0	62.0	62.0	63.0	64.0	51.0	45.5	--	59.0	44.0	41.0	22.0
07-Mar-18	0	0	0	0	30.5	48.0	60.0	59.0	61.0	62.0	50.0	43.5	49.0	58.0	36.0	31.0	19.0
21-Feb-18	0	0	0	0	21.0	43.5	58.0	65.0	59.0	60.0	52.0	23.0	59.0	64.0	31.0	10.0	22.0
05-Feb-18	0	0	0	0	25.0	45.0	46.0	60.0	60.0	61.0	54.0	17.5	50.0	60.0	37.5	5.7	24.5
24-Jan-18	0	0	0	0	36.0	46.0	59.0	60.0	60.0	61.0	54.0	34.5	59.0	60.0	40.5	31.5	23.0
09-Jan-18	0	0	0	0	40.5	2.7	54.0	56.0	59.0	60.0	51.0	17.0	52.0	60.0	37.0	14.5	25.5
27-Dec-17	0	0	0	0	28.0	40.0	64.0	62.0	61.0	62.0	52.0	25.5	63.0	64.0	41.0	5.4	24.5
12-Dec-17	0	0	0	0	31.0	31.0	66.0	62.0	62.0	64.0	51.0	27.0	64.0	65.0	43.0	22.0	25.5
27-Nov-17	0	0	0	0	13.5	9.0	51.0	18.0	45.0	50.0	43.5	4.8	45.0	59.0	26.0	3.0	33.0
11-Nov-17	0	0	0	0	41.0	43.0	60.0	60.0	60.0	61.0	50.0	17.0	57.0	62.0	44.0	7.1	32.0
28-Oct-17	0	0	0	0	44.0	47.0	59.0	58.0	61.0	61.0	49.0	40.5	--	60.0	42.0	17.0	26.0
13-Oct-17	0	0	0	0	25.0	0.5	10.5	6.7	16.5	33.0	27.0	0.9	38.0	52.0	23.5	6.2	35.0
27-Sep-17	0	0	0	0	52.0	46.5	60.0	60.0	59.0	64.0	56.0	16.0	60.0	65.0	43.5	12.5	37.5
16-Sep-17	0	0	0	0	50.0	48.5	61.0	57.0	60.0	61.0	55.0	40.0	56.0	59.0	39.0	30.0	35.0
30-Aug-17	0	0	0	0	39.0	43.0	58.0	56.0	61.0	59.0	55.0	14.5	55.0	56.0	33.0	9.9	37.0
17-Aug-17	0	0	0	0	36.0	36.5	54.0	54.0	60.0	61.0	56.0	6.4	55.0	57.0	34.0	6.5	36.0
24-Jul-17	0	0	0	0	45.0	49.0	55.0	53.0	57.0	58.0	52.0	31.0	51.0	53.0	39.0	13.5	28.0
10-Jul-17	0	0	0	0	43.0	42.5	53.0	51.0	56.0	58.0	53.0	20.5	51.0	53.0	38.0	12.5	26.5
08-Jun-17	0	0	0	0	--	--	--	--	--	--	--	--	--	--	--	5.4	21.0
09-Apr-17	0	0	0	0	--	--	--	--	--	--	--	--	--	--	--	15.5	19.0
11-Apr-17	0	0	0	0	--	--	--	--	--	--	--	--	--	--	--	32.0	17.5
08-Mar-17	0	0	0	0	--	--	--	--	--	--	--	--	--	--	--	13.0	0
21-Feb-17	0	0	0	0	--	--	--	--	--	--	--	--	--	--	--	0.6	17.0
07-Feb-17	0	0	0	0	--	--	--	--	--	--	--	--	--	--	--	3.3	14.5
23-Jan-17	0	0	0	0	--	--	--	--	--	--	--	--	--	--	--	0.8	14.0
05-Jan-17	0	0	0	0	--	--	--	--	--	--	--	--	--	--	--	7.7	8.2
16-Dec-16	0	0	0	0	4.9	8.5	22.5	25.5	34.5	41.5	14.5	17.5	25.0	25.5	22.5	38.5	5.7
# Readings	*32*	*32*	*32*	*32*	*24*	*24*	*24*	*24*	*24*	*24*	*24*	*24*	*22*	*24*	*24*	*32*	*32*
Min. value	*0*	*0*	*0*	*0*	*4.9*	*0.5*	*0.0*	*7*	*16.5*	*33.0*	*15*	*0*	*25.0*	*25.5*	*9.4*	*1*	*0*
Max. value	*0*	*0*	*0*	*0*	*52.0*	*53.0*	*66.0*	*65.0*	*66.0*	*69.0*	*56.0*	*45.5*	*64.0*	*65.0*	*44.0*	*41.0*	*37.5*
AVERAGE	***0***	***0***	***0***	***0***	***33.3***	***34.8***	***52.4***	***52.5***	***55.8***	***59.4***	***49.6***	***20.2***	***53.5***	***57.9***	***34.6***	***14.4***	***23.7***
Location	*SG-302*	*SG-303*	*SG-304*	*SG-329*	*SP-01*	*SP-02*	*SP-03*	*SP-04*	*SP-05*	*SP-06*	*SP-07*	*SP-08*	*SP-09*	*SP-10*	*SP-11*	*SP-12*	*SP-13*

Terminal 5 / RA-3 Landfill Gas Treatment System

Monitoring Results December 2016 - June 2018

Parameter: CARBON DIOXIDE
(LMS-40 instrument field measurement - percent by volume.)

	Monitoring Location																
Date	SG-302	SG-303	SG-304	SG-329	SP-01	SP-02	SP-03	SP-04	SP-05	SP-06	SP-07	SP-08	SP-09	SP-10	SP-11	SP-12	SP-13
29-Jun-18	2.4	2.9	2.1	1.5	6.6	18.0	4.1	0.4	4.3	5.1	2.1	8.7	5.6	4.5	3.4	9.8	5.7
15-Jun-18	2.4	2.3	2.1	1.5	6.4	21.0	3.4	0	3.9	4.1	1.8	5.8	4.4	3.8	4.2	8.9	4.9
01-Jun-18	2.4	2.0	1.9	0.3	8.1	0.7	0	2.6	2.3	4.8	4.5	2.2	6.3	5.9	9.5	9.9	5.5
11-May-18	0.1	0.6	1.8	0.7	7.1	0.7	4.5	0.7	5.5	6.1	1.1	6.4	5.6	5.0	11.0	8.9	5.1
26-Apr-18	1.4	2.1	0.8	1.0	4.7	21.0	3.2	0	3.6	3.9	0.7	2.0	4.1	3.6	6.4	6.0	4.8
06-Apr-18	1.7	2.0	2.1	1.6	4.5	19.0	3.4	0	3.5	4.1	0.7	4.6	--	3.3	6.6	5.8	4.5
07-Mar-18	1.3	2.0	1.9	1.2	4.3	17.0	3.9	0	4.4	4.1	0.7	3.8	5.5	3.9	4.0	5.4	4.8
21-Feb-18	1.1	1.5	2.0	1.5	5.8	16.0	5.8	0	5.5	6.0	0.8	5.0	5.9	4.7	6.7	7.5	4.8
05-Feb-18	0.6	0	0.4	1.8	5.6	16.0	3.7	4.6	4.6	4.8	1.0	6.8	7.1	5.3	8.5	7.1	4.6
24-Jan-18	0.5	2.2	2.9	1.8	4.3	16.0	4.3	0.3	4.2	4.9	0.8	2.1	4.9	4.7	7.0	6.0	4.6
09-Jan-18	1.2	3.1	2.5	1.8	5.1	1.3	4.2	4.4	6.6	6.5	0.9	7.3	7.5	6.1	8.1	6.4	4.5
27-Dec-17	1.5	3.1	3.4	1.8	5.7	15.0	4.6	0	5.2	5.9	1.0	7.5	6.0	5.3	8.1	7.2	4.9
12-Dec-17	2.4	3.4	3.2	1.5	5.7	12.0	4.0	0.1	4.9	4.9	0.0	6.2	6.0	4.8	8.1	6.5	5.3
27-Nov-17	2.1	3.6	3.7	1.9	8.1	1.1	8.4	2.9	6.6	9.9	2.6	6.9	9.5	8.5	9.6	7.3	5.7
11-Nov-17	2.0	3.7	3.4	2.3	6.0	16.0	5.4	1.0	6.1	6.7	1.6	6.6	6.9	5.3	10.0	8.3	5.4
28-Oct-17	2.0	4.0	3.6	1.9	5.0	17.0	4.7	0	5.8	5.6	1.1	5.0	--	4.7	12.0	9.4	6.1
13-Oct-17	1.7	2.9	3.5	2.1	8.1	0.1	1.0	0.9	2.1	3.8	2.6	7.3	9.8	8.7	9.9	12.0	6.1
27-Sep-17	1.4	3.5	3.1	1.7	6.8	17.0	5.2	0	5.5	6.1	2.2	12.0	5.4	4.5	10.0	9.8	5.3
16-Sep-17	1.6	4.1	1.9	2.0	6.8	16.0	5.0	0	5.6	5.5	2.0	10.0	4.7	4.1	9.3	11.0	6.1
30-Aug-17	1.6	3.9	2.0	1.9	8.1	17.0	5.6	3.9	6.4	6.4	2.1	13.0	6.1	5.2	11.5	12.0	6.6
17-Aug-17	1.7	4.0	1.9	1.8	7.6	14.0	5.8	1.2	6.9	7.2	2.1	12.0	6.1	5.2	12.0	12.0	6.5
24-Jul-17	1.5	3.2	2.9	1.6	7.0	17.0	5.6	0.1	6.1	6.4	1.6	8.4	5.2	4.5	13.0	9.7	5.3
10-Jul-17	2.0	3.2	1.9	1.6	6.6	15.0	5.8	1.1	6.9	7.0	1.5	8.7	5.7	4.8	--	9.3	5.5
08-Jun-17	2.3	2.6	1.4	2.0	--	--	--	--	--	--	--	--	--	--	--	9.0	4.7
09-May-17	1.8	2.3	0.9	1.6	--	--	--	--	--	--	--	--	--	--	--	8.6	4.6
11-Apr-17	1.0	1.7	0.1	1.7	--	--	--	--	--	--	--	--	--	--	--	6.4	4.6
08-Mar-17	0.7	1.2	0.3	1.5	--	--	--	--	--	--	--	--	--	--	--	4.8	7.8
21-Feb-17	0.3	1.3	0.1	1.7	--	--	--	--	--	--	--	--	--	--	--	7.2	4.3
07-Feb-17	0.1	2.0	0.6	1.2	--	--	--	--	--	--	--	--	--	--	--	7.0	4.3
23-Jan-17	0.3	1.4	0.5	1.3	--	--	--	--	--	--	--	--	--	--	--	6.7	4.8
05-Jan-17	0.8	3.8	1.6	1.0	--	--	--	--	--	--	--	--	--	--	--	8.0	4.6
16-Dec-16	0.9	4.0	1.0	1.2	6.2	5.6	4.4	1.1	4.5	4.8	3.2	4.8	8.4	8.6	11.0	5.9	5.0
# Readings	*32*	*32*	*32*	*32*	*24*	*24*	*24*	*24*	*24*	*24*	*24*	*24*	*22*	*24*	*23*	*32*	*32*
Min. value	*0.1*	*0.0*	*0*	*0.3*	*4.3*	*0.1*	*0.0*	*0.0*	*2.1*	*3.8*	*0.0*	*2.0*	*4.1*	*3.3*	*3.4*	*4.8*	*4.3*
Max. value	*2.4*	*4.1*	*3.7*	*2.3*	*8.1*	*21.0*	*8.4*	*4.6*	*6.9*	*9.9*	*4.5*	*13.0*	*9.8*	*8.7*	*13.0*	*12.0*	*7.8*
AVERAGE	***1.4***	***2.6***	***1.9***	***1.6***	***6.3***	***12.9***	***4.4***	***1.1***	***5.0***	***5.6***	***1.6***	***6.8***	***6.2***	***5.2***	***8.7***	***8.1***	***5.2***
Location	*SG-302*	*SG-303*	*SG-304*	*SG-329*	*SP-01*	*SP-02*	*SP-03*	*SP-04*	*SP-05*	*SP-06*	*SP-07*	*SP-08*	*SP-09*	*SP-10*	*SP-11*	*SP-12*	*SP-13*

Terminal 5 / RA-3 Landfill Gas Treatment System

Monitoring Results December 2016 - June 2018

Parameter: OXYGEN
(LMS-40 instrument field measurement - percent by volume.)

	Monitoring Location																
Date	SG-302	SG-303	SG-304	SG-329	SP-01	SP-02	SP-03	SP-04	SP-05	SP-06	SP-07	SP-08	SP-09	SP-10	SP-11	SP-12	SP-13
29-Jun-18	16.5	16.7	18.5	19.1	0	1.4	0	0	0	0	0	5.4	0	0	15.7	0	0.3
15-Jun-18	16.3	17.4	18.3	18.9	0	0	0	0	0	0	0	0.2	0	0	13.0	0	0
01-Jun-18	15.9	17.8	18.3	20.4	0.1	18.7	21.1	3.0	6.0	0.2	0.2	12.9	0	0	2.6	0	0
11-May-18	20.3	19.6	17.5	19.5	0	17.8	0	0	0	0	0	8.6	0	0	0	0	0
26-Apr-18	13.5	17.0	18.8	19.5	0	0	0	0	0	0	0	16.5	0	0	0	0	0
06-Apr-18	14.7	17.4	15.5	17.5	0	0	0	0	0	0	0	0	--	0	0	0	0
07-Mar-18	14.0	16.8	16.1	18.0	0.3	0	0	0.3	0.3	0.3	0.3	0	0.6	0	3.0	0	0.2
21-Feb-18	13.4	17.1	16.0	16.7	0.4	0	0	0	1.1	0	0	2.3	0	0	5.1	0	0
05-Feb-18	12.6	20.7	20.2	14.9	1.4	1.8	2.0	0	0	0	0.1	2.0	0.9	0.6	2.1	0	0
24-Jan-18	13.5	17.3	13.9	14.9	0	0	0	0	0	0	0	0	0	0	0	0	0
09-Jan-18	14.6	16.0	14.9	15.2	0	19.5	0	0	0	0	0	2.9	0	0	0	0	0
27-Dec-17	14.5	16.9	13.8	15.8	0	0	0	0	0	0	0	0	0	0	0	0	0
12-Dec-17	14.3	15.4	14.4	16.1	0	0.4	0	0	0	0	0	0	0	0	0	0	0
27-Nov-17	15.2	15.5	13.5	16.3	0.8	16.0	0	13.4	3.1	0	0	5.8	0	0	0	0	0
11-Nov-17	16.5	14.9	16.1	15.7	0	0	0	0	0	0	0	0	0	0	0	0	0
28-Oct-17	16.3	15.3	15.7	17.0	0	0	0	0	0	0	0	0	--	0	0	0	0
13-Oct-17	17.6	17.3	16.8	17.3	0.2	20.2	11.3	15.4	8.9	6.5	8.9	9.2	0	0	0	0	0
27-Sep-17	17.4	16.0	16.6	18.02	0	0.1	0	0	0	0	0	0	0	0	0	0	0.01
16-Sep-17	17.7	15.8	18.8	18.0	0	0	0	0	0	0	0	0	0	0	0	0	0
30-Aug-17	17.8	16.1	18.6	18.3	0.1	1.1	0	0	0	0	0	0.9	0	0	0	0	0
17-Aug-17	17.4	16.1	18.9	18.6	0.6	2.6	0	0	0	0	0	3.0	0	0	0	0	0
24-Jul-17	17.8	16.2	17.2	19.0	0.2	0.3	0.2	0	0.1	0	1.3	0.9	1.0	5.3	2.2	1.5	1.2
10-Jul-17	17.3	16.0	--	--	0	1.6	0.1	0.1	0.1	0.1	0.1	1.7	--	--	--	--	--
08-Jun-17	15.4	16.2	16.8	17.6	--	--	--	--	--	--	--	--	--	--	--	0.1	0.1
09-May-17	13.0	15.2	15.4	17.3	--	--	--	--	--	--	--	--	--	--	--	0.1	0.4
11-Apr-17	13.2	16.8	20.4	16.9	--	--	--	--	--	--	--	--	--	--	--	0.1	0.2
08-Mar-17	15.3	18.3	19.9	18.8	--	--	--	--	--	--	--	--	--	--	--	1.6	3.7
21-Feb-17	16.1	18.2	20.3	15.8	--	--	--	--	--	--	--	--	--	--	--	2.2	0.7
07-Feb-17	16.8	17.9	18.5	17.4	--	--	--	--	--	--	--	--	--	--	--	0.7	0.1
23-Jan-17	16.5	18.4	19.1	17.2	--	--	--	--	--	--	--	--	--	--	--	2.0	0.5
05-Jan-17	15.4	15.3	15.1	17.9	--	--	--	--	--	--	--	--	--	--	--	1.4	1.3
16-Dec-16	17.9	15.2	17.4	17.9	1.2	0.8	1.1	0.5	0.5	0.6	0.4	1.0	0.3	0.1	0.5	0.7	1.0
# Readings	*32*	*32*	*31*	*31*	*24*	*24*	*24*	*24*	*24*	*24*	*24*	*24*	*21*	*23*	*23*	*31*	*31*
Min. value	*12.6*	*14.9*	*13.5*	*14.9*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Max. value	*20.3*	*20.7*	*20.4*	*20.4*	*1.4*	*20.2*	*21.1*	*15.4*	*8.9*	*6.5*	*8.9*	*16.5*	*1.0*	*5.3*	*15.7*	*2.2*	*3.7*
AVERAGE	***15.8***	***16.8***	***17.1***	***17.5***	***0.2***	***4.3***	***1.5***	***1.4***	***0.8***	***0.3***	***0.5***	***3.1***	***0.1***	***0.3***	***1.9***	***0.3***	***0.3***
Location	*SG-302*	*SG-303*	*SG-304*	*SG-329*	*SP-01*	*SP-02*	*SP-03*	*SP-04*	*SP-05*	*SP-06*	*SP-07*	*SP-08*	*SP-09*	*SP-10*	*SP-11*	*SP-12*	*SP-13*

ATTACHMENT 3

Semiannual Inspection of T-5 Ecology-Lead Sites

2018 Mid-Year Inspection

Second Quarter 2018

RA-1 (FORMER BURLINGTON NORTHERN BUCKLEY YARD PROPERTY), RA-2 AND RA-3 INSPECTION FORM FOR PAVEMENT AND BALLAST COVERS, SURFACE WATER COLLECTION SYSTEMS, AND SECURITY SYSTEMS

Name of Inspector: Warren Hansen, PE/Abby Hawley, EIT
Date (D/M/Y): 6/27/2018
Title: Civil Engineer/Environmental Engineer
Employer: Windward Environmental LLC

FORMER RA-1 BUCKLEY YARD, RA-2 AND RA-3 PAVEMENT AND BALLAST COVERS

1. Interview site personnel. Inquire about condition of pavement and ballast covers including location(s) of any penetrations, cracks, tears, gouges, persistent ponding of water on pavement or around surface water collection system components. Inquire about condition of security fencing and security measures effectiveness. Summarize information obtained from site personnel interviews in the space below along with the name, job title, and daytime telephone number of the interviewee(s).

   This inspection was conducted on June 27, 2018. Limited tenant activity was occurring within the terminal area during the inspection; this activity was generally located in the south end of the original Terminal 5 area, although some equipment was being stored in the former Lockheed Yard II (Remediation Area 5 [RA-5]). Evidence of tenant activity (i.e., presence of vehicles) was also observed at the consolidated landfill (part of the former Seattle Steel Inc. property [RA-3]), although no activity was occurring at the time of the inspection. Gate and access security to the terminal continues to be maintained; a guard continues to control access at the terminal entrance. The gate at the intersection of SW Florida Street and Harbor Avenue SW was unlocked at the time of the inspection; the Port of Seattle was notified of this situation.

   This inspection consisted of examining cap surfaces; select drainage features; fencing; access controls (e.g., locks); and signs at the Burlington Northern Buckley Yard (BNBY) property (RA-1), the Salmon Bay Steel North property (RA-2), and RA-3. RA-5 was also inspected, at the client's request. The inspection focused on previously identified issues as well as any new problems. No interviews were conducted as part of this inspection, as there are currently no major tenants at the terminal.

   Repairs to the localized settling at RA-3 adjacent to the rails in the south portion of the terminal (noted in the 2017 reports [Attachment 1: map note 1 in the 2017 mid-year report and Attachment 2: photos 1 and 2 in the 2017 end-of-year report]) continue to be in good condition. As noted in the 2017 end-of-year report, the area of settlement (approximately 115 × 40 ft) has been patched, and the edges of the new pavement have been sealed.

   The chain-link security fencing surrounding the consolidated landfill was examined. Most of the vegetation along the fence on the west side of the landfill has been removed, aiding in this inspection. The hole in the fencing along the west side of the landfill identified during the 2017 end-of-year inspection has been patched. No new holes in the fence were observed.

Vegetation accumulation in the drainage swale along the southwest side of the landfill observed during the 2017 end-of-year inspection has been removed.

Vegetation—including butterfly bushes (*Buddleia davidii*)—is prevalent near the terminal entrance (RA-2; Attachment 1: map note 1) and throughout the terminal in rail tracks and switch pits (RA-2 and RA-3; Attachment 2: photo 1). Vegetation overgrowth is an issue that requires ongoing maintenance, particularly during the current period of reduced activity at the terminal. It is recommended that the vegetation in RA-2 and RA-3 be removed before it damages the pavement cap system.

2. Inspect pavement and ballast covers, observable surface water collection system components, and site security measures. Identify areas which represent potential pathways for infiltration of surface water through pavement. Include exact location, the nature of the problem, and possible corrective actions. Estimate percentage of pavement with surficial cracks (cracks that do not completely penetrate pavement cover) if surficial cracking appears prevalent. If large areas of site pavement are inaccessible at the time of inspection due to container placement or site activities, identify these locations. Inspect surface water collection system catch basins and identify maintenance (clean out) or possible repair requirements. Also inspect perimeter fencing and comment on site security measures. Summarize inspection observations in spaces below.

The pavements, ballast covers, fencing, and surface features associated with the stormwater drainage systems were examined during this inspection. As noted in Section 1, repairs to the localized area of settling (RA-3) are in good condition.

Four areas of pavement mounding with cracks wider than ¼ in. were observed in RA-2 and RA-3:

1. Map note 2 (RA-2): The impacted area is approximately 10 × 10 ft (photo 2). The cracks are approximately as wide as 1 in. and as deep as 4 in. (photo 3). This area was originally noted in the 2017 end-of-year inspection and does not appear to have changed since then.
2. Map note 3 (RA-2): This impacted area is approximately 15 × 3 ft and the cracks are approximately as wide as 1 in. and as deep as 4 in. (photos 4 and 5).
3. Map note 4 (RA-3): This area is approximately 5 × 3 ft, with cracks as wide as approximately ½ in. and as deep as approximately 3 in. (photos 6 and 7).
4. Map note 5 (RA-2): The impacted area is approximately 25 × 6 ft (photos 8 and 9). The cracks are approximately as wide as 1 in. and as deep as 5 in. (photo 10).

These conditions are localized and do not compromise the overall cap performance. However, these mounding areas are in traffic areas and will need to be addressed before a new tenant occupies the terminal. The cause of the mounding in the four areas (possibly buried piles) should be determined and, if possible, removed, and the cracked areas should be repaired. Near-term (i.e., temporary) sealing of the cracks should also be done to prevent further deterioration in these four locations.

During the inspection, the ballast covers appeared to be in good condition and the Burlington Northern (BN) access road showed evidence of continued maintenance (presumably by BN). Sections of the road appeared to have been re-graveled since the previous inspection, although it now contains some new potholes (no deeper than approximately 2 to 3 in.). These potholes should be checked during the next inspection, and BN should be notified if their condition worsens.

Vegetation has been cleared from the western side of the consolidated landfill, on both sides of the drainage swale. Vegetation had been cleared from the eastern side of the landfill before the 2017 end-of-year inspection. There were no signs of erosion or exposure of the underlying consolidated landfill liner during this inspection.

The catch basin located near the southeast corner of the consolidated landfill area is obstructed by organic debris (map note 6 and photo 11). Although no drainage issues were observed during the inspection, this vegetation should be cleared to prevent future drainage issues.

The landfill cover area east of Harbor Avenue SW and outside of the fenced consolidated landfill area was checked for signs of erosion. No erosion was observed.

3. Immediately contact Port of Seattle Environmental Manager at (206) 787-3193 if any crack, tear, or hole is present in the pavement or ballast cover that provides direct contact to subsurface soils. Penetrations through the cap/covers that provide direct contact to subsurface soils require immediate repair. Minor surficial pavement cracks are to be repaired on a more routine maintenance schedule but on a schedule that prevents exacerbation of cracking to allow infiltration of surface water or direct contact with subsurface soils.

   The four localized areas of pavement mounding and cracking located in RA-2 and RA-3 should be addressed as described in Section 2.

RAILROAD TRACK AREA
Ballast covering ties, shoulders as designed: ___Y__
Ballast rutted or uneven, requiring regrading: ___N__
Repair Type/Location: _____

PAVEMENT AREA
Open cracks and/or ruts: None _____ Repair needed __X__
Surface Drainage (ponding): None __X__ Repair needed ____
Repair Type/Location: See Sections 2 and 3 for information on four areas in RA-2 and RA-3 where cracks are present in areas of pavement mounding.

SURFACE WATER COLLECTION
Slow drainage or ponding at catch basin: None _____ Repair needed__X__
Ponding in other areas: None __X__ Repair needed_____

Maintenance/Repair Type/Location: See Section 2 for information on a catch basin located in the consolidated landfill area that should be cleared of organic debris.

SITE SECURITY

Signs, fence & gates in place Yes __X__ Repair needed __X__

Repair Type/Location: See Section 1 for information on the gate near the intersection of SW Florida Street and Harbor Avenue SW that should be secured. Control of public access is specified as an institutional control in the Operations and Maintenance Manual for Environmental Components (Onsite and JMN 1998).

4. Sketch site. Attach a site sketch indicating areas inspected, locations of problem areas (prevalent surface cracking in pavement, etc.), and inaccessible areas. Include photographs of problem areas if appropriate.

A map (Attachment 1) and photos (Attachment 2) are attached showing locations and issues noted in this inspection report.

CONSOLIDATED LANDFILL COVER

1. Inspect the cover surface semi-annually to check for erosion and any areas of ponding. If erosion extends to the depth of the geotextile layer, the geotextile must be inspected for any damage (punctures, tears, bulging, etc.) and repaired in accordance with the Field Quality Control Manual. The Port's Environmental Specialist shall be notified regarding any damage or alteration to the landfill cover or surface water collection systems.

Does erosion of the cover exist in any form resulting in the potential for exposure of the underlying geotextile layer? _____ YES __X__NO

No erosion was observed during this inspection.

Are there areas of persistent ponding of water that result from depressions in the pavement surface or from lack of catch basin/storm drain maintenance?
_____ YES __X__NO
Note any problem areas on an attached site sketch or map and include photographs as needed.

No ponding was observed during this inspection.

SUMMARY OF RECOMMENDATIONS

The conditions identified in this report requiring follow-up actions are listed below:

Condition Noted	Map (Attachment 1) reference	Recommendation
Vegetation growth near terminal entrance, RA-2	1	Remove vegetation from this location and from throughout RA-2 and RA-3 during maintenance. Check during future inspections.
Pavement mounding with cracks wider than ¼ in., RA-2	2	Evaluate and repair prior to new tenant occupancy. Clean and seal cracks. Check during future inspections.

Condition Noted	Map (Attachment 1) reference	Recommendation
Pavement mounding with cracks wider than ¼ in., RA-2	3	Evaluate and repair prior to new tenant occupancy. Clean and seal cracks. Check during future inspections.
Pavement mounding with cracks wider than ¼ in., RA-3	4	Evaluate and repair prior to new tenant occupancy. Clean and seal cracks. Check during future inspections.
Elongated pavement mounding with cracks wider than ¼ in., RA-2	5	Evaluate and repair prior to new tenant occupancy. Clean and seal cracks. Check during future inspections.
Catch basin obstructed by organic debris, RA-3	6	Clear catch basin of organic debris.

List attachments below:

- Attachment 1: Terminal 5 Ecology-lead remediation areas - Locations of observations noted in report (map)
- Attachment 2: Select Inspection Photographs

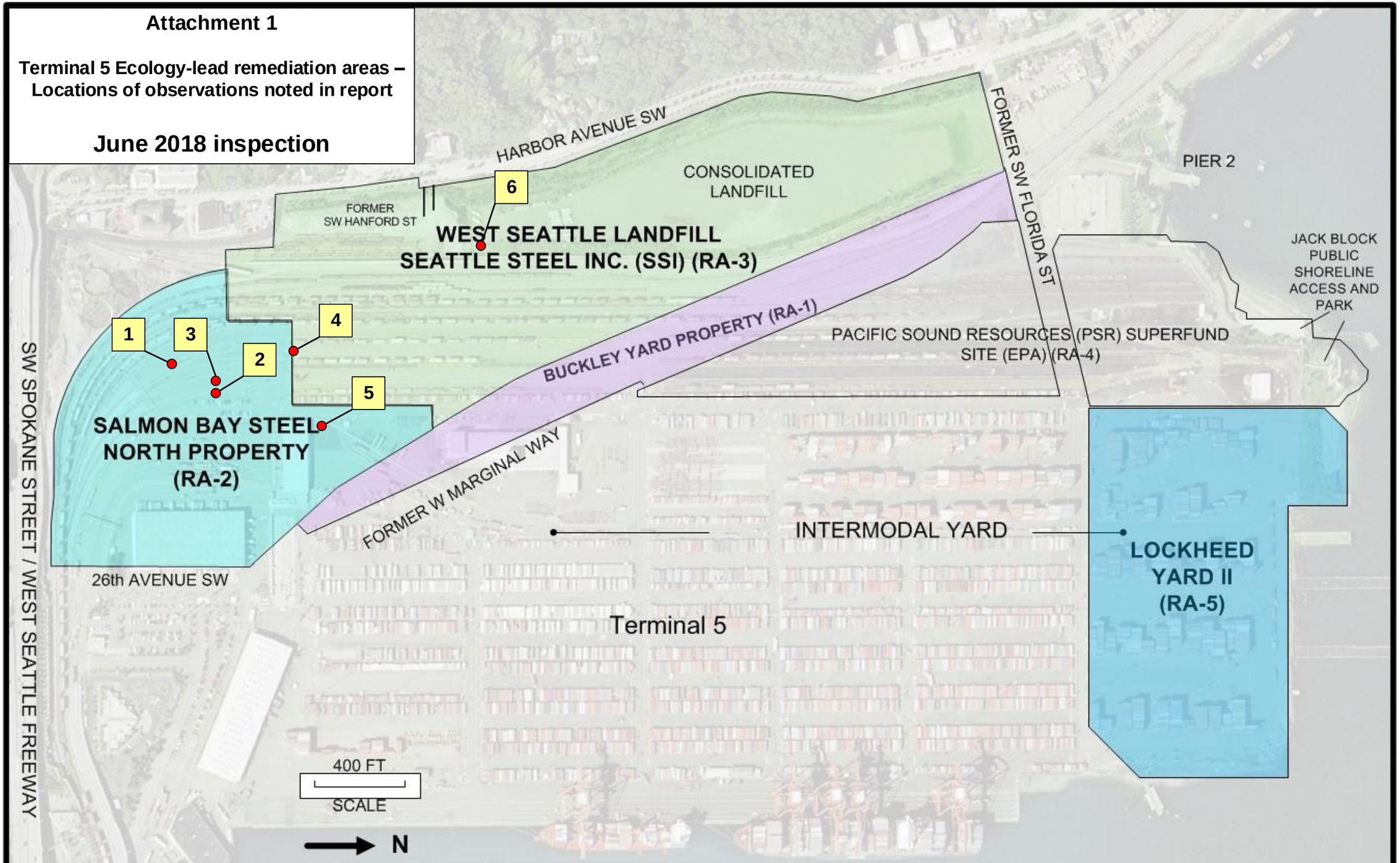
REFERENCES

Onsite, JMN. 1998. Port of Seattle-Terminal 5 operations and maintenance manual for environmental components. Prepared for Port of Seattle Onsite Enterprises, Inc. and JMN Associates, Redmond, WA.

Attachment 1

Terminal 5 Ecology-lead remediation areas – Locations of observations noted in report

June 2018 inspection



Notes:

1. Vegetation growth near terminal entrance
2. Pavement mound and cracks (1)
3. Pavement mound and cracks (2)
4. Pavement mound and cracks (3)
5. Elongated pavement mound and cracks
6. Catch basin obstructed by organic debris

TERMINAL 5 EXPANSION (SOUTHWEST HARBOR PROJECT) – ECOLOGY-LEAD CONSENT DECREE REMEDIATION AREAS

ATTACHMENT 2

SELECT INSPECTION PHOTOGRAPHS

Photo 1. Vegetation growth along rail tracks: RA-2 and RA-3

Photo 2. Mound in pavement with cracks as wide as 1 in.: RA-2 (map note 2)

Photo 3. Close-up of mound in pavement with cracks as wide as 1 in.: RA-2 (map note 2)

Photo 4. Mound in pavement with cracks as wide as 1 in.: RA-2 (map note 3)

Photo 5. Close-up of mound in pavement with cracks as wide as 1 in.: RA-2 (map note 3)

Photo 6. Mound in pavement with cracks as wide as ½ in.: RA-3 (map note 4)

Photo 7. Mound in pavement with cracks as wide as ½ in.: RA-3 (map note 4)

Photo 8. Elongated mound in pavement with cracks as wide as 1 in.: RA-2 (map note 5)

Photo 9. Another view of elongated mound in pavement with cracks: RA-2 (map note 5)

Photo 10. Close up of elongated mound in pavement with cracks as wide as 1 in.: RA-2 (map note 5)

Photo 11. Organic debris obstructing catch basin near southeast corner of consolidated landfill: RA-3