



City of Bothell™

October 1, 2018

Jerome Cruz, Ecology Site Manager  
Department of Ecology,  
Northwest Regional Office Toxic Cleanup Program  
3190 160<sup>th</sup> Avenue SE  
Bellevue, Washington 98008-5452

**Re: Quarterly Progress Report for period ending September 2018**

Site Name: **BOTHELL SERVICE CENTER/ SIMON & SON**  
Site Address: 18107 Bothell Way NE, Bothell WA 98011  
Parcel Numbers: 237420-0065  
Facility/Site No.: 33215922  
Consent Decree No.: 18-2-02852-3 SEA (Effective date February 2, 2018)

Date submitted: October 1, 2018  
Reporting Period: July 1 - September 30, 2018

**Summary:**

City of Bothell (PLP) continues to make progress on work being performed for the Bothell Service Center site (BSC), in accordance with the Consent Decree (CD) with the Department of Ecology.

Per the requirements of Section XI of the Consent Decree "Progress Reports", the attached quarterly progress report has been prepared for the three-month period preceding this submittal to satisfy the terms described in the Consent Decree.

During this period much of the work has been geared towards the continued operation of the ERH system, monitoring well sampling and starting the bio-remediation.

The attached progress report provides an update on work accomplished during the period ending September 30, 2018 for the Site. Please contact me if you have any questions.

Sincerely,

Nduta Mbuthia  
Project Coordinator, City of Bothell

Public Works Department  
18415 101<sup>st</sup> Ave NE  
Bothell, WA 98011  
425.806.6800  
[www.bothellwa.gov](http://www.bothellwa.gov)



City of Bothell™

Reporting Period:	July 1 - September 30, 2018
Date submitted (electronically):	October 1, 2018
Date mailed (certified w/return receipt):	October 1, 2018
Prepared by:	Nduta Mbuthia, Project Coordinator City of Bothell, Public Works Department Phone: 425.806.6829. Email: <a href="mailto:nduta.mbuthia@bothellwa.gov">nduta.mbuthia@bothellwa.gov</a>

## **CONTENTS**

### **A. A list of on-site activities that have taken place during this quarter**

The following activities have occurred this quarter -

- i. Continuing operation of Electrical Resistance Heating electrodes (ongoing since May 29, 2018). As of September 12, the amount of PCE mass removal was over 1,200 pounds. Based on current conditions and removal of 57lbs per day it is anticipated that the ERH process will be done in November 2018.
- ii. Final EDR approved on August 28, 2018 (deliverables B3, B4 & B5 on CD Exhibit D)
- iii. Installation and operation of the bio-remediation system started in late August
- iv. Groundwater sampling event in September/October; sampling data will be analyzed and tabulated during the next reporting period – the data will be provided to Ecology site manager as soon as it becomes available

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

There have been no deviations this quarter

### **C. Description of all deviations from the CAP (Exhibit C) and Schedule (Exhibit D) during the current quarter and any planned deviations in the upcoming quarter**

There has been a deviation from the schedule this quarter; specifically with regard to item C3 “Install and begin operation of the bio-remediation-groundwater recirculation/SVE systems”. Exhibit D/Schedule states that this deliverable was due within two months of the effective date of the CD, i.e. April 2018. Although the bio-remediation wells were installed by July, the recirculation system was not yet in operation due to a delay in the delivery of the remediation trailer by the contractor’s vendor. The Ecology site manager was kept apprised of the issue and notified of the delay. Installation of the system started the week of August 27 and took about 2 weeks to complete. The SVE will also be installed later. In future, supplemental wells may be added if the need arises; Ecology’s site manager will be consulted prior to doing so.

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

The plan for recovering lost time is as follows: The Bioremediation/Groundwater Recirculation (B/GR) system is a longer term remedial action, unlike the ERH system. Three months and six

months after the B/GR system is started, Kane Environmental will evaluate installing supplemental extraction and/or injection wells to expand the system to reduce the remedial action timeline.

- E. All raw data (including laboratory analyses) received by Defendants during the past quarter and an identification of the source of the sample  
See attached.
- F. A list of deliverables for the upcoming quarter if different from the schedule  
Same as the schedule

### Attachments

ERH Report  
Documentation Compliance Letter, updated  
Exhibit D from the CD

### Project photos





# CASCADE

T H E R M A L

## Update

### BSCSS ERH Project – Bothell, WA

09/12/2018

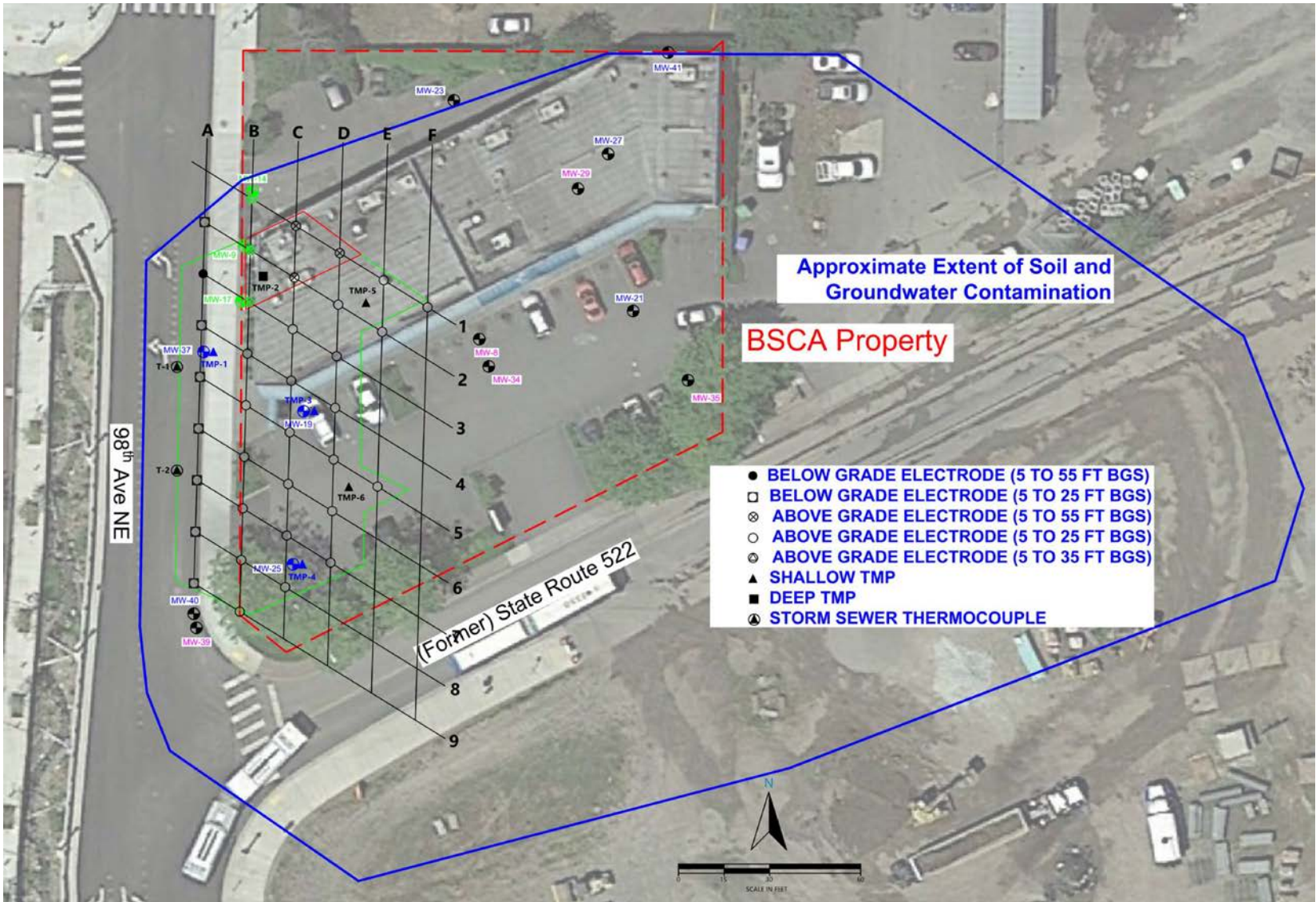


**TERRATHERM**

a Cascade Company





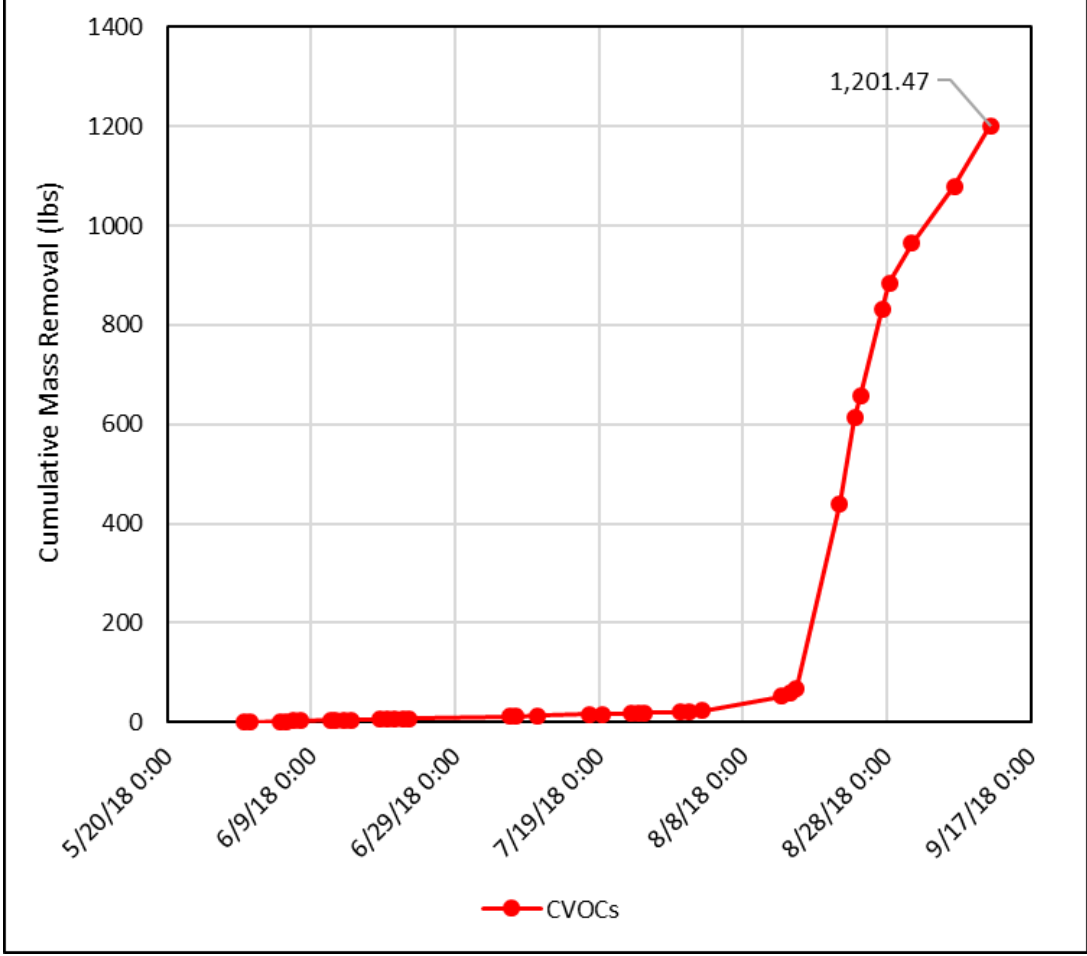


## Project Summary:

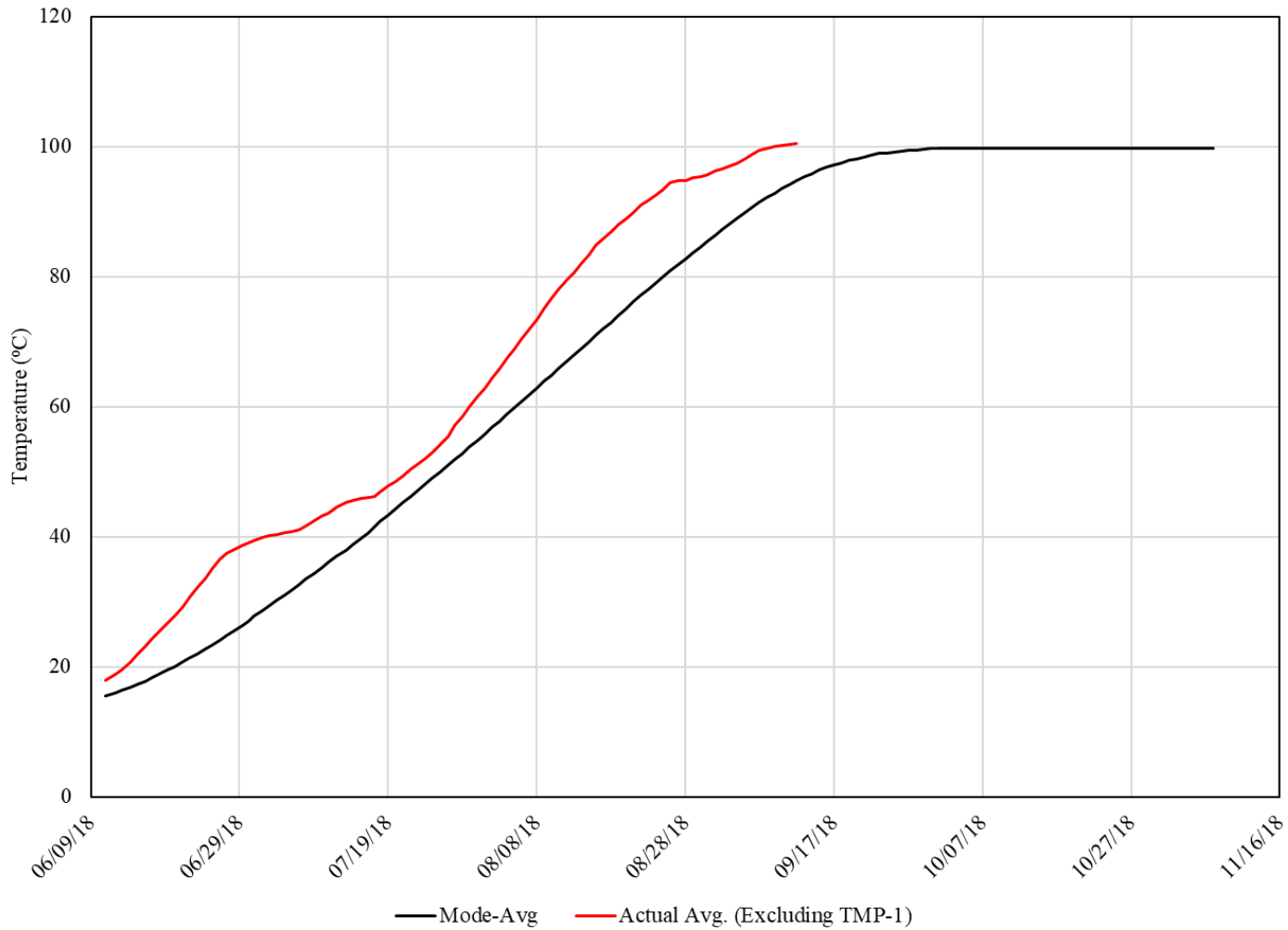
The system has now been fully operational for 104-days, with average subsurface temperatures of 99.7°C across the entire treatment volume. Approximately 78% of the treatment volume is above 100 °C, with maximum temperatures reaching 119.8 °C . The system has been performing at or above projected temperatures based off of our original model outputs.

Mass removal estimates based on PID readings, and calibrated with contemporaneous quantitative analytical vapor sampling, show that approximately 1201.5-lbs of CVOC mass has been removed through the vapor stream. Furthermore, over the past 20-days of operation, during which time subsurface temperatures have averaged above the heteroazotropic boiling point of PCE (87.9 °C) , daily mass removal rates have averaged approximately 57.4-lbs/day. Assuming this current trend continues for the remaining 54-days of ERH system operation, an additional 4,301-lbs of CVOC mass will be removed from the treatment volume. Based off of these trends and anticipated 5,502-lbs of CVOC mass will be removed from the treatment volume.

### BSCSS ERH Project - Bothell, WA - Cumulative Mass Removal Based on PID Readings

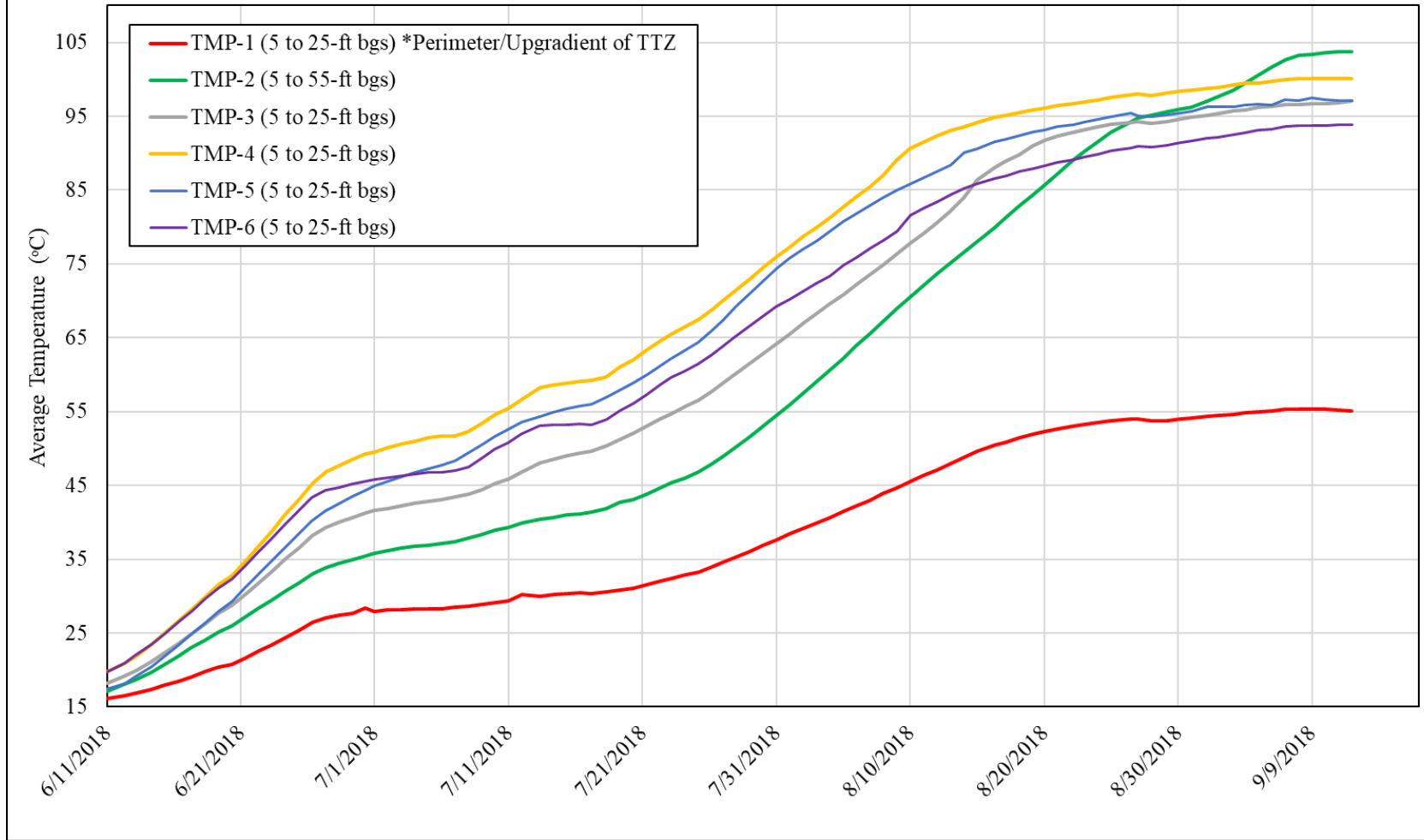


BSCSS-ERH Project - Modelled Average vs Actual Average Temperature Curves

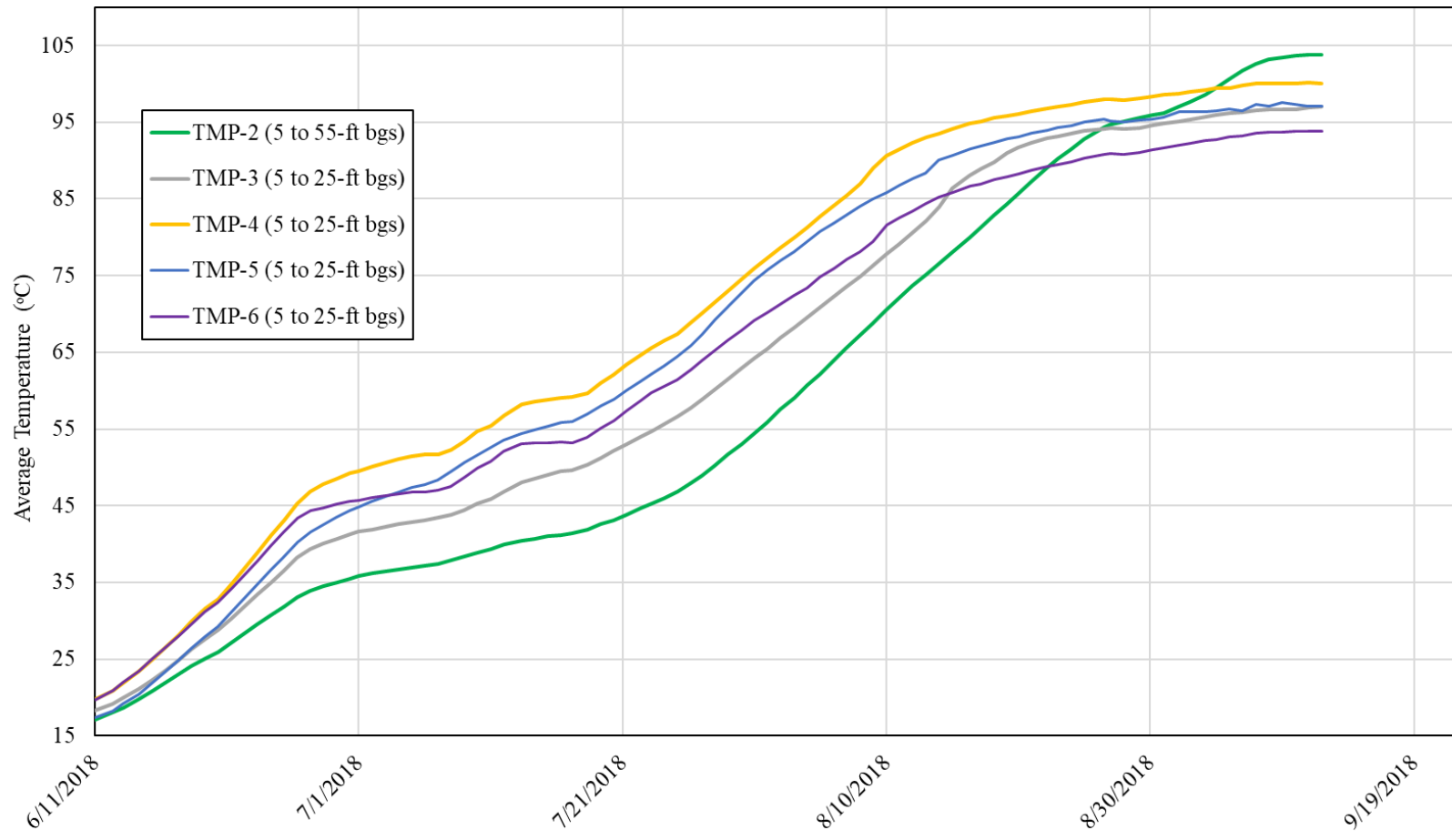




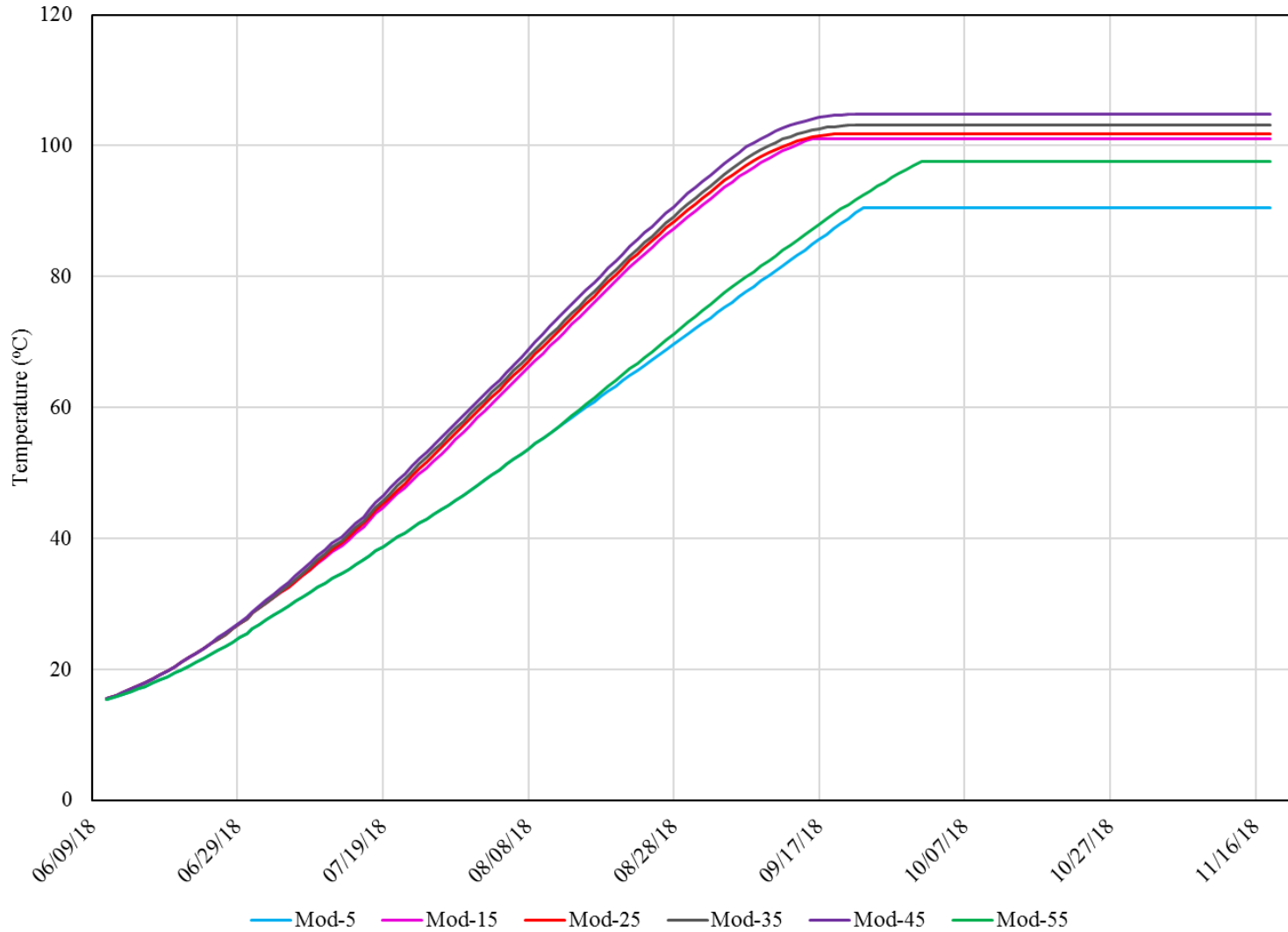
### BSCSS ERH Project - Bothell, WA Average Temperature Progress



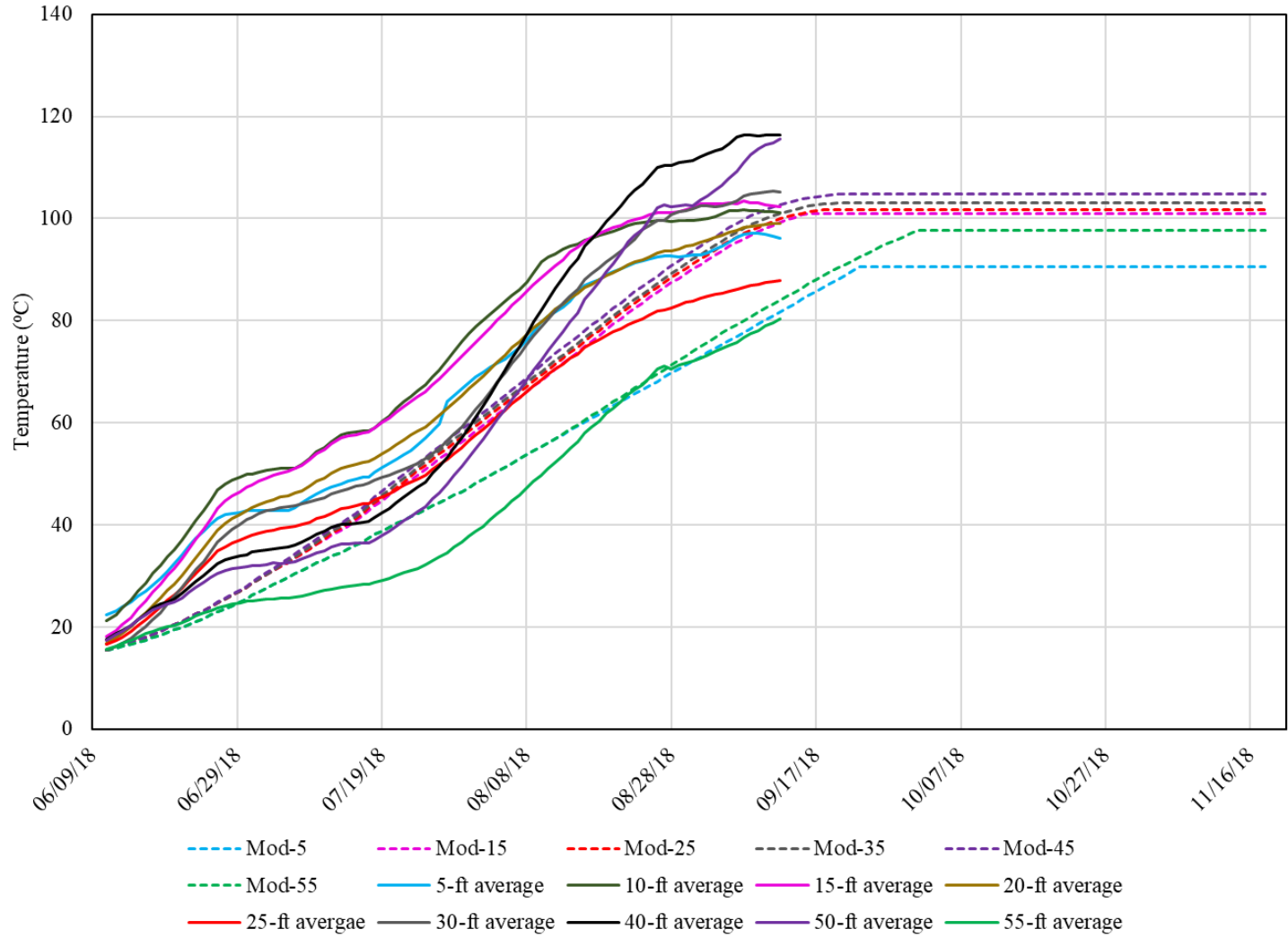
BSCSS ERH Project - Bothell, WA  
Average Temperature Progress



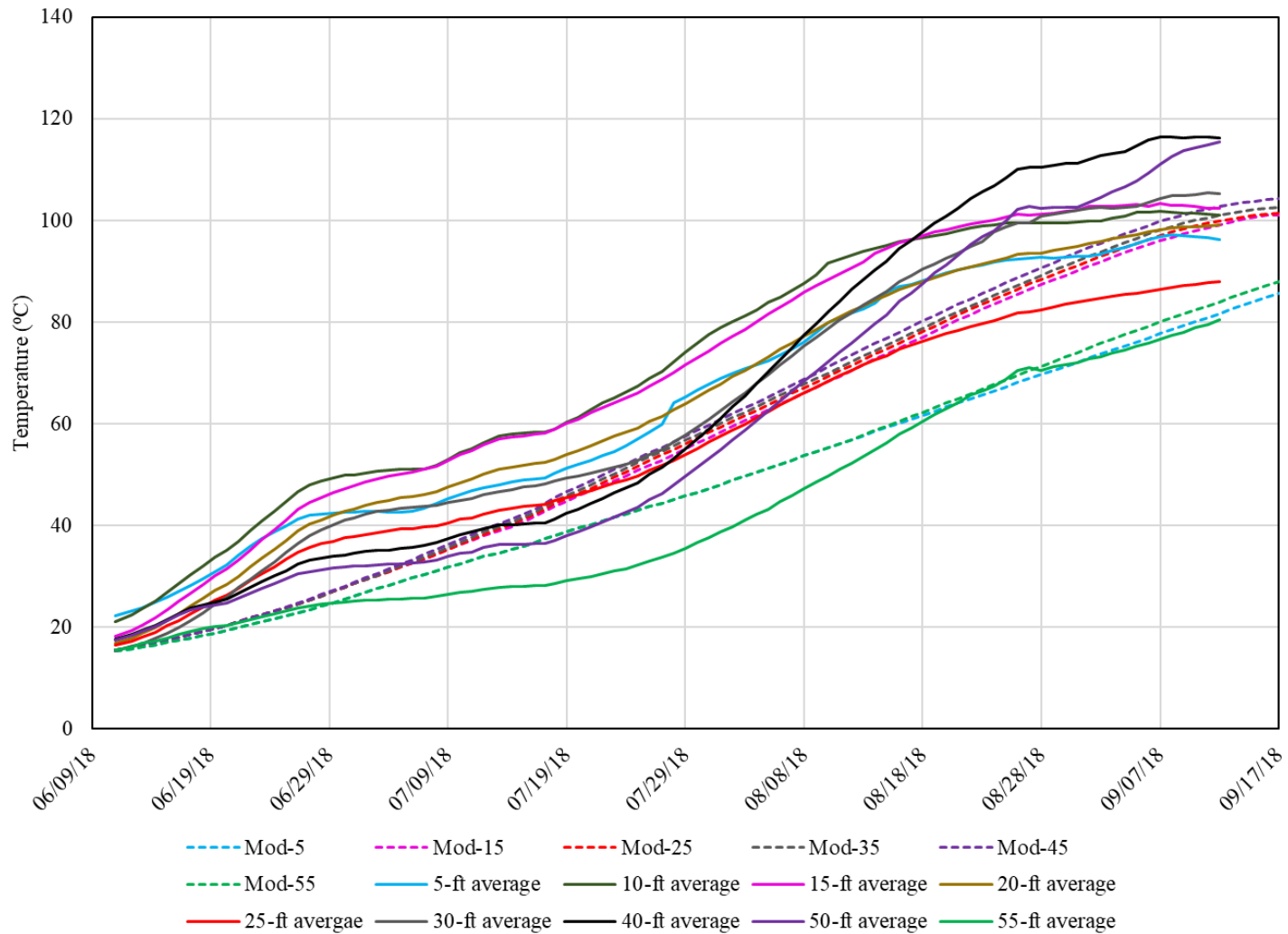
BSCSS-ERH Project - Modelled Temperature Curves



BSCSS-ERH Project - Modelled vs Achieved Temperature Curves (Excluding TMP-1)



BSCSS-ERH Project - Modelled vs Achieved Temperature Curves (Excluding TMP-1)





TMP-2 Temperatures (°C)											
Date/Time Stamp	TMP2-5	TMP2-10	TMP2-15	TMP2-20	TMP2-25	TMP2-30	TMP2-35	TMP2-40	TMP2-45	TMP2-50	TMP2-55
8/4/2018 0:00	44.6	57.1	63.8	66.8	69.1	66.9	66.9	68.9	62.8	58.5	42.2
8/5/2018 0:00	44.5	58.3	65.2	68.3	70.8	68.6	69.3	71.3	64.8	60.4	43.3
8/6/2018 0:00	45.1	59.3	66.6	69.9	72.8	70.6	71.7	73.6	66.9	62.2	44.7
8/7/2018 0:00	45.7	60.6	67.8	71.3	74.5	72.3	74.0	75.9	68.9	64.0	45.8
8/8/2018 0:00	46.3	61.8	69.2	72.8	76.6	74.1	76.4	78.3	70.9	65.8	47.2
8/9/2018 0:00	47.3	63.0	70.6	74.2	78.2	75.8	78.8	80.6	72.9	67.8	48.5
8/10/2018 0:00	48.2	64.0	72.0	75.7	80.1	77.5	81.2	82.8	75.0	69.4	49.8
8/11/2018 0:00	49.2	65.2	73.3	77.1	81.7	79.1	83.4	84.9	77.1	71.1	51.1
8/12/2018 0:00	50.0	66.5	74.7	78.6	83.2	80.6	85.6	87.1	79.1	72.8	52.2
8/13/2018 0:00	50.6	67.7	75.9	79.9	84.6	82.1	87.6	89.1	81.1	74.6	53.6
8/14/2018 0:00	51.1	69.0	77.1	81.1	85.7	83.7	89.6	91.0	83.1	76.4	55.0
8/15/2018 0:00	51.8	70.2	78.4	82.2	87.0	85.2	91.3	92.7	84.9	78.0	56.2
8/16/2018 8:00	53.3	71.9	80.0	83.8	88.9	87.0	93.9	95.1	87.6	80.7	58.0
8/17/2018 4:00	54.5	73.3	81.2	85.0	90.0	88.2	95.4	96.6	89.3	82.2	59.1
8/18/2018 4:00	56.0	75.2	82.4	86.3	91.2	89.6	97.2	98.2	91.2	84.1	60.4
8/19/2018 4:00	57.5	77.0	83.6	87.4	92.2	90.7	99.0	99.8	93.2	86.0	61.8
8/20/2018 0:00	59.0	78.6	84.7	88.3	93.1	91.9	100.4	101.1	94.8	87.6	62.9
8/21/2018 0:00	60.6	81.1	85.9	89.6	93.8	93.3	102.1	102.7	96.8	89.5	64.1
8/22/2018 4:00	62.7	83.7	87.3	90.8	94.8	94.8	104.2	104.4	99.1	91.6	65.6
8/23/2018 0:00	64.6	85.2	88.1	91.5	95.4	96.3	105.6	105.7	100.6	92.9	66.5
8/24/2018 0:00	66.2	86.5	89.2	92.4	96.1	99.6	106.7	106.7	102.1	93.7	67.5
8/25/2018 0:00	67.6	87.2	90.5	93.2	97.1	100.3	108.1	108.4	104.1	95.6	68.8
8/26/2018 12:00	69.0	87.9	92.2	94.5	97.8	101.2	109.9	110.1	106.4	97.9	70.5
8/27/2018 0:00	69.6	88.2	92.9	94.8	97.8	101.3	110.3	110.6	107.0	98.4	71.0
8/28/2018 0:00	69.8	88.8	94.6	95.3	99.5	102.0	110.3	110.5	107.2	97.4	70.5
8/29/2018 4:00	69.7	89.3	95.9	95.8	100.0	102.6	110.6	111.2	108.0	97.1	71.3
8/30/2018 4:00	69.8	89.7	97.3	96.1	100.2	103.0	110.7	111.6	108.3	96.9	71.6
8/31/2018 0:00	70.2	90.0	98.5	96.3	100.4	103.4	110.7	111.8	108.4	96.7	72.1
9/1/2018 4:00	70.7	90.9	99.7	97.0	100.9	104.0	111.4	112.7	109.3	97.9	72.7
9/2/2018 0:00	72.2	91.6	100.6	97.5	100.7	104.3	111.9	113.4	110.0	98.9	73.2
9/3/2018 4:00	75.1	93.6	101.2	98.2	100.2	104.5	112.4	114.0	110.9	100.3	74.0
9/4/2018 0:00	77.4	96.3	101.7	98.7	100.0	105.0	112.6	114.6	111.6	101.5	74.5
9/5/2018 0:00	80.7	99.4	101.8	99.3	100.0	105.6	113.6	115.6	112.7	102.9	75.2
9/6/2018 0:00	84.0	100.1	102.1	99.6	100.1	106.8	115.3	116.5	114.1	104.3	75.8
9/7/2018 0:00	86.3	100.5	102.2	100.1	100.3	108.4	115.4	117.3	116.0	105.9	76.6
9/8/2018 0:00	87.8	100.6	101.7	100.2	100.5	109.2	115.4	117.3	117.8	107.3	77.4
9/9/2018 0:00	87.4	100.6	101.6	100.3	100.6	109.3	115.2	117.2	119.0	108.3	78.0
9/10/2018 0:00	87.0	100.5	101.7	100.5	100.5	109.8	115.3	117.4	119.4	109.3	78.9
9/11/2018 0:00	85.9	100.5	101.6	100.4	100.6	110.2	115.3	117.4	119.6	110.2	79.6
9/12/2018 0:00	84.7	100.5	101.4	100.2	100.6	109.9	115.3	117.2	119.8	111.2	80.4

TMP-3					
Date/Time Stamp	TMP3-5	TMP3-10	TMP3-15	TMP3-20	TMP3-25
8/4/2018 0:00	63.2	82.6	77.6	67.7	56.9
8/5/2018 0:00	64.1	84.2	79.1	68.9	58.1
8/6/2018 0:00	65.3	85.9	80.5	70.1	59.3
8/7/2018 0:00	66.6	87.5	82.1	71.1	60.4
8/8/2018 0:00	68.2	89.2	83.6	72.2	61.4
8/9/2018 0:00	70.0	90.9	85.0	73.3	62.4
8/10/2018 0:00	71.9	92.6	86.4	74.3	63.5
8/11/2018 0:00	74.2	94.3	87.7	75.2	64.3
8/12/2018 0:00	76.7	95.9	89.0	76.1	65.4
8/13/2018 0:00	79.6	97.6	90.4	76.8	66.3
8/14/2018 0:00	84.0	99.2	91.9	77.7	67.2
8/15/2018 0:00	91.4	100.6	93.3	78.4	68.2
8/16/2018 8:00	94.1	102.2	95.4	79.3	69.6
8/17/2018 4:00	94.8	102.8	96.8	79.8	70.3
8/18/2018 4:00	95.8	103.3	98.4	80.2	71.3
8/19/2018 4:00	98.1	103.8	99.7	80.9	72.3
8/20/2018 0:00	99.2	104.1	100.7	81.5	73.0
8/21/2018 0:00	99.9	104.2	101.6	82.1	73.8
8/22/2018 4:00	100.0	104.6	102.5	82.7	74.5
8/23/2018 0:00	100.1	104.7	102.9	83.0	75.1
8/24/2018 0:00	100.2	104.7	103.7	83.3	75.6
8/25/2018 0:00	100.4	104.9	104.1	83.7	76.3
8/26/2018 12:00	100.4	104.9	104.6	84.0	77.0
8/27/2018 0:00	100.3	104.7	104.8	84.3	77.3
8/28/2018 0:00	100.4	104.3	104.4	84.0	77.3
8/29/2018 4:00	100.4	104.1	104.5	84.6	77.9
8/30/2018 4:00	100.4	104.0	104.7	85.3	78.7
8/31/2018 0:00	100.6	103.9	104.8	85.8	79.2
9/1/2018 4:00	100.6	103.8	104.8	86.6	79.8
9/2/2018 0:00	100.5	103.8	104.7	87.3	80.4
9/3/2018 4:00	100.6	103.8	104.6	88.4	81.0
9/4/2018 0:00	100.7	103.7	104.7	89.0	81.4
9/5/2018 0:00	100.5	103.7	104.7	90.1	81.8
9/6/2018 0:00	100.5	103.6	104.7	90.7	82.1
9/7/2018 0:00	100.5	103.6	104.7	91.6	82.5
9/8/2018 0:00	100.4	103.2	104.5	92.2	82.8
9/9/2018 0:00	100.3	103.0	104.3	92.6	83.3
9/10/2018 0:00	100.1	102.9	104.0	93.0	83.6
9/11/2018 0:00	99.9	102.7	103.9	93.9	84.0
9/12/2018 0:00	99.9	102.5	104.2	94.4	84.4

TMP-4 Temperatures (°C)					
Date/Time Stamp	TMP4-5	TMP4-10	TMP4-15	TMP4-20	TMP4-25
8/4/2018 0:00	36.5	84.4	90.3	81.8	68.8
8/5/2018 0:00	39.6	86.3	91.8	83.1	69.8
8/6/2018 0:00	41.6	88.1	93.3	84.3	70.8
8/7/2018 0:00	42.1	89.7	94.8	85.3	71.9
8/8/2018 0:00	43.9	92.1	96.4	86.7	72.9
8/9/2018 0:00	44.9	96.8	97.7	87.8	74.0
8/10/2018 0:00	45.4	99.8	98.8	88.9	75.0
8/11/2018 0:00	43.7	100.0	99.9	90.1	75.9
8/12/2018 0:00	39.2	100.2	101.0	91.2	76.9
8/13/2018 0:00	39.6	100.3	101.9	92.2	77.8
8/14/2018 0:00	41.7	100.0	102.3	93.2	78.8
8/15/2018 0:00	44.5	99.9	102.8	94.2	79.6
8/16/2018 8:00	41.4	100.1	103.3	95.3	80.6
8/17/2018 4:00	41.5	100.2	103.2	95.9	81.2
8/18/2018 4:00	42.5	100.3	103.4	96.6	81.8
8/19/2018 4:00	43.5	100.1	103.5	97.3	82.4
8/20/2018 0:00	45.5	100.1	103.5	97.8	83.0
8/21/2018 0:00	45.7	100.1	103.5	98.4	83.6
8/22/2018 4:00	44.5	100.2	103.5	98.9	84.3
8/23/2018 0:00	47.4	100.2	103.6	99.4	84.8
8/24/2018 0:00	44.1	100.3	103.6	99.8	85.2
8/25/2018 0:00	44.9	100.4	103.8	100.2	85.9
8/26/2018 12:00	41.0	100.3	104.0	100.8	86.7
8/27/2018 0:00	41.8	100.2	104.0	100.9	86.9
8/28/2018 0:00	43.5	100.2	103.3	100.9	87.0
8/29/2018 4:00	43.7	100.2	103.5	101.2	87.5
8/30/2018 4:00	44.0	100.2	103.5	101.6	88.1
8/31/2018 0:00	45.8	100.3	103.7	101.8	88.4
9/1/2018 4:00	44.1	100.2	103.8	102.2	88.9
9/2/2018 0:00	45.2	100.2	104.0	102.3	89.1
9/3/2018 4:00	44.5	100.4	104.1	102.6	89.8
9/4/2018 0:00	46.2	100.5	104.0	102.7	90.6
9/5/2018 0:00	46.7	100.3	104.1	102.9	90.6
9/6/2018 0:00	47.7	100.4	104.1	103.5	91.1
9/7/2018 0:00	48.6	100.5	104.2	103.8	91.6
9/8/2018 0:00	46.2	100.3	104.1	103.9	91.9
9/9/2018 0:00	43.9	100.3	103.8	104.1	92.2
9/10/2018 0:00	43.5	100.2	103.7	103.8	92.5
9/11/2018 0:00	43.2	100.2	103.8	103.7	92.8
9/12/2018 0:00	43.2	100.3	103.4	103.6	92.9

TMP-5					
Date/Time Stamp	TMP5-5	TMP5-10	TMP5-15	TMP5-20	TMP5-25
8/4/2018 0:00	100.3	99.5	86.3	74.1	57.6
8/5/2018 0:00	100.3	100.2	88.1	75.8	58.8
8/6/2018 0:00	100.4	100.4	89.6	77.6	59.9
8/7/2018 0:00	100.4	100.6	90.8	79.2	61.1
8/8/2018 0:00	100.2	100.8	92.1	80.9	62.2
8/9/2018 0:00	100.2	100.8	93.3	82.5	63.3
8/10/2018 0:00	100.2	100.8	94.3	84.0	64.3
8/11/2018 0:00	100.4	100.9	95.3	85.4	65.4
8/12/2018 0:00	100.4	101.0	96.2	86.8	66.4
8/13/2018 0:00	100.4	101.1	97.1	88.1	67.4
8/14/2018 0:00	100.4	101.3	101.1	89.4	68.4
8/15/2018 0:00	100.3	100.9	101.8	90.5	69.3
8/16/2018 8:00	100.5	101.1	102.5	91.8	70.6
8/17/2018 4:00	100.6	101.1	102.7	92.6	71.2
8/18/2018 4:00	100.5	101.1	102.8	93.5	72.1
8/19/2018 4:00	100.4	101.0	103.1	94.3	72.9
8/20/2018 0:00	100.5	100.9	103.2	94.9	73.5
8/21/2018 0:00	100.5	100.9	103.2	95.7	74.4
8/22/2018 4:00	100.6	100.7	103.3	96.4	75.2
8/23/2018 0:00	100.4	100.9	103.7	96.8	75.7
8/24/2018 0:00	100.4	100.9	103.3	97.4	76.6
8/25/2018 0:00	100.5	100.8	103.7	98.1	77.3
8/26/2018 12:00	100.4	100.7	103.7	98.8	78.3
8/27/2018 0:00	100.5	100.6	102.2	99.1	78.6
8/28/2018 0:00	100.3	100.5	101.9	98.9	78.7
8/29/2018 4:00	100.1	100.6	101.3	99.6	79.4
8/30/2018 4:00	100.3	100.6	100.9	100.0	80.1
8/31/2018 0:00	100.4	100.7	100.9	100.3	80.6
9/1/2018 4:00	100.3	100.7	102.9	100.6	81.1
9/2/2018 0:00	100.3	100.6	102.1	100.8	81.7
9/3/2018 4:00	100.4	100.7	101.1	101.2	82.2
9/4/2018 0:00	100.4	100.6	100.8	101.7	82.8
9/5/2018 0:00	100.2	100.5	101.4	101.7	83.2
9/6/2018 0:00	100.2	100.3	99.6	102.1	83.9
9/7/2018 0:00	100.3	100.4	101.9	102.5	84.4
9/8/2018 0:00	100.3	100.4	100.7	102.5	84.9
9/9/2018 0:00	100.2	100.3	101.7	102.7	85.4
9/10/2018 0:00	100.1	100.1	100.4	102.8	85.8
9/11/2018 0:00	100.2	100.1	99.2	102.7	86.3
9/12/2018 0:00	100.0	100.0	98.9	102.9	86.7

TMP-6 Temperatures (°C)					
Date/Time Stamp	TMP6-5	TMP6-10	TMP6-15	TMP6-20	TMP6-25
8/4/2018 0:00	78.7	88.5	82.3	68.9	53.7
8/5/2018 0:00	80.9	90.4	83.7	70.2	54.8
8/6/2018 0:00	83.3	91.2	85.1	71.4	55.8
8/7/2018 0:00	86.1	92.6	86.4	72.6	56.7
8/8/2018 0:00	89.8	93.6	87.7	73.7	57.6
8/9/2018 0:00	94.2	95.1	89.1	75.0	58.5
8/10/2018 0:00	99.1	100.8	90.3	76.1	59.3
8/11/2018 0:00	99.8	101.8	91.5	77.1	60.0
8/12/2018 0:00	99.9	102.1	92.7	78.2	60.9
8/13/2018 0:00	99.9	103.0	93.8	79.1	61.7
8/14/2018 0:00	99.7	103.4	94.8	80.1	62.6
8/15/2018 0:00	99.7	103.3	95.8	81.1	63.2
8/16/2018 8:00	99.9	103.6	96.7	82.1	64.1
8/17/2018 4:00	99.9	103.5	97.3	82.5	64.5
8/18/2018 4:00	100.1	103.6	98.0	83.3	65.1
8/19/2018 4:00	99.9	103.5	98.6	84.0	65.6
8/20/2018 0:00	99.9	103.6	98.9	84.6	66.1
8/21/2018 0:00	100.0	103.6	99.4	85.2	66.6
8/22/2018 4:00	99.9	103.6	100.0	85.9	67.2
8/23/2018 0:00	100.0	103.6	100.3	86.4	67.6
8/24/2018 0:00	100.1	103.5	100.7	87.0	68.1
8/25/2018 0:00	100.1	103.7	101.2	87.6	68.6
8/26/2018 12:00	100.1	103.8	101.6	88.4	69.2
8/27/2018 0:00	100.1	103.8	101.7	88.6	69.6
8/28/2018 0:00	100.2	103.5	101.6	88.7	69.6
8/29/2018 4:00	99.9	103.3	101.7	89.2	70.1
8/30/2018 4:00	100.2	103.3	102.2	89.7	70.5
8/31/2018 0:00	100.3	103.4	102.4	90.1	70.9
9/1/2018 4:00	100.2	103.4	102.8	90.6	71.2
9/2/2018 0:00	100.3	103.4	102.8	90.9	71.7
9/3/2018 4:00	100.2	103.4	103.2	91.4	72.2
9/4/2018 0:00	100.2	103.5	103.3	91.8	72.3
9/5/2018 0:00	100.1	103.7	103.6	92.2	72.8
9/6/2018 0:00	100.2	103.4	103.7	92.7	73.3
9/7/2018 0:00	100.2	103.6	103.9	93.1	73.7
9/8/2018 0:00	100.1	103.4	103.9	93.4	74.0
9/9/2018 0:00	100.1	103.2	103.7	93.7	74.1
9/10/2018 0:00	100.1	103.0	103.8	93.8	74.5
9/11/2018 0:00	100.1	102.7	103.7	94.1	74.8
9/12/2018 0:00	100.0	102.3	103.9	94.3	74.9



<b>FINANCIAL OBLIGATIONS (A. Administrative)</b>		
Provide a cost estimate to Ecology for the implementation of the CD requirements, including operation, maintenance, and compliance monitoring	<i>Feb 12, 2018 BSCSS grant submitted through Ecology EAGL with all cost estimates attached</i>	A4
Provide Ecology with proof of financial assurances in a form acceptable to Ecology	<i>Provided in CFP sheet</i>	A5
Adjust the cost estimated to reflect inflation and changes in cost estimates and provide updated financial assurances	Ongoing with EAGL, spending updated each quarter	-
Pay outstanding Ecology oversight costs of \$13,108.83	<i>Confirmed; All Ecology invoices have been processed</i>	-
Pay Ecology's future oversight costs	Within 30 days of receiving Ecology's invoice; On-going	-
<b>PRE-CLEANUP OBLIGATIONS (B. Design)</b>		
Notify Ecology of selected contractor name and qualifications	<i>Completed, March 13, 2018</i>	A2
Submit written monthly Progress Reports	<i>Submitted 4/10/18 (QPR1); 7/9/18 (QPR2); 10/1/18 (QPR3)</i>	A3
Submit draft Pre-Remedial Design Project Plans (PRDI) <sup>2</sup>	<i>Completed (included in draft EDR report)</i>	B1
Submit draft PRDI Data Report and draft Engineering Design Report (EDR) <sup>3</sup>	<i>Completed, Feb 8, 2018(v1); March 15, 2018(v2)</i>	B2
Submit final PRDI Data Report and EDR	<i>Completed, April 24, 2018(v1); July 2018 (v2, addressing ECY's 6/5/18 comments). Approved EDR - August 28, 2018</i>	B3
Submit 90% plans and specs (per WAC 173-340-400(4)(b))	<i>Completed, same time as above</i>	B4
Submit 100% plans and specs	<i>Completed, same time as above</i>	B5
<b>FIELD CONSTRUCTION (C)</b>		<b>EXH D ref</b>
Complete construction procurement	<i>Completed; Feb 13, 2018 through March 2018</i>	C1
ERH System Installation	<i>Completed; Feb 13 through May 14, 2018</i>	C2
ERH Operation	In-progress; Started May 29, 2018	
Start install and begin operation of bioremediation-groundwater recirculation /SVE systems	In-progress; Started installation May 2018. System operation started August 2018 (refer to QPR#3 items C & D)	C3
Install compliance well monitoring network	Complete; July 2018	C4
Complete construction	In-progress	C5
Conduct ERH soil performance sampling	October 2018	C6
Contingent soil excavation in ERH treatment area	October to November 2018	C7
Decommission ERH and SVE system	Within 4 to 6 weeks of ERH final system shutdown	C8
Submit Cleanup Action Report and As-Built Drawings and Report; draft Institutional Control (IC) Plan; draft Environmental Covenants (s); and an updated Title Report	Within 60 days of decommission of ERH and SVE systems	C9

<b>POST-CONSTRUCTION (D)</b>		
Submit final IC Plan and final Environmental Covenants(s)	Within 30 days of Ecology's comments on draft IC Plan & draft Environmental Covenant	D1
Record the restrictive covenant with the office of the King County Auditor	Within 5 days after the later of Ecology's approval of the Final IC Plan or Ecology's signature on the Final Environmental Covenant	D2
Provide the original recorded restrictive covenant to Ecology	Within 30 days of the covenant recording date	-
Indoor Air Sampling of all occupied buildings on the site	May-July 2019, 2020, 2021	D3
Performance Groundwater Monitoring	June 2018 to June 2020 - Event#1 - September 2018	D4
Quarterly Performance Monitoring	June 2018 to June 2019 - Event#1 - September 2018	
Biannual Performance Monitoring	June 2019 to June 2020	
Decommission Bioremediation/Groundwater Recirculation system and monitoring wells	2020 to 2022 (if operation of bioremediation system is extended)	D5
Soil vapor sampling	2020	D6
Groundwater Confirmation Monitoring	2020-2024	D7
Quarterly Compliance Monitoring	June 2020 to June 2022	
As-Built Drawings and Report of vapor intrusion mitigation measures (vapor barrier and passive venting systems). And other engineering and institutional controls (if any)	Within 30 days of the City's receipt from the developer	D8
<b>PERIODIC REVIEWS</b>		
Meet with Ecology to discuss the status of the Site	Every 5 years after initiation of cleanup action (until 10 years after termination of the CD)	D9
Five Year Compliance Monitoring and Periodic Review reports	To follow Groundwater compliance monitoring (D.7). Groundwater monitoring required once every five years for the duration of the institutional controls on groundwater (if present) under the environmental covenant.	
Submit periodic review reports to Ecology documenting whether human health and the environment are being protected	At least 90 days prior to each periodic review meeting with Ecology (until 10 years after termination of the CD)	

1) Schedule is in calendar days. Deliverable due date may be modified with Ecology concurrence without amendment to the Consent Decree.

2) Project Plans include the following: Work Plan, Sampling and Analysis Plan, Quality Assurance Project Plan, and Health and Safety Plan, to be submitted for Ecology review and approval. All plans will include a schedule for implementation as applicable.

3) The Engineering Design Report includes: a Construction Quality Assurance Project Plan, a Compliance Monitoring and Contingency Response Plan, Proposed Best Management Practices, Water Quality Monitoring Plan, and Substantive Requirements of Procedural

**Exhibit D**  
**Site Schedule of Work and Deliverables**

<b>Deliverables</b>		<b>Due (Calendar Days)</b>
<b>A. Administrative</b>		
A.1	Consent Decree entered by the King County Superior Court (Effective Date of the CD)	Within 5 days of the execution by the Parties
A.2	Notification of selected contractor name and qualifications	Within 5 days of the effective date of Consent Decree (A.1)
A.3	Progress Reports	Quarterly on the 10 <sup>th</sup> of the month beginning after the effective date of the Consent Decree (A.1)
A.4	Financial Assurances – submit cost estimate for Ecology review and approval	Within 60 days of the effective date of Consent Decree
A.5	Financial Assurances - provide proof of financial assurances	Within 60 days after Ecology approves cost estimate (A.4)
<b>B. Design</b>		
B.1	Draft Pre-Remedial Design (PRDI) Project Plans <sup>2</sup>	Within 5 days of the effective date of Consent Decree (A.1)
B.2	Draft PRDI Data Report and Draft Engineering Design Report (EDR) <sup>3</sup>	Within 5 days of Ecology approval of Final PRDI Project Plans (B.1)
B.3	Final PRDI Data Report and EDR Report	Within 5 days of receipt of Ecology's comments on the Draft PRDI Data and EDR Reports (B.2)
B.4	90 % Plans and Specs [per WAC 173-340-400(4)(b)]	Within 5 days of receipt of Ecology comments on Final EDR Report (B.3)
B.5	100 % Plans and Specs	Within 5 days of receipt of Ecology comments on 90 % plans and specifications (B.4)
<b>C. Field Construction</b>		
C.1	Complete Construction Procurement	Within 5 days of completion of the 100% plans and specifications (B.1)
C.2	ERH System installation	Within 2 months of the effective date of Consent Decree
	ERH Operation	Within 6 to 8 months of the effective date of Consent Decree
C.3	Start install and begin operation of bioremediation-groundwater recirculation/SVE systems	Within 2 months of the effective date of Consent Decree
C.4	Install compliance monitoring well network	Within 2 months of the effective date of Consent Decree
C.5	Complete Construction	Within 2 months of the effective date of Consent Decree
C.6	ERH soil performance sampling	Within 6 to 8 months of the effective date of Consent Decree
C.7	Contingent soil excavation in ERH treatment area	Within 6 to 9 months of the effective date of Consent Decree

C.8	Decommission ERH and SVE system	Within 4 to 6 weeks of ERH system final shutdown
C.9	Cleanup Action Report and As-Built Drawings and Report; Draft Institutional Control (IC) Plan; Draft Environmental Covenant(s); and an updated Title Report	Within 60 days of decommission of ERH and SVE systems (C.8)
<b>D. Post Construction Work</b>		
D.1	Final IC Plan and Final Environmental Covenant(s)	Within 30 days of receipt of Ecology comments on the Draft IC Plan and Draft Environmental Covenant(s).
D.2	Record Final Environmental Covenant(s) with King County Auditor	Within 5 days after Ecology's approval of the Final IC Plan or Ecology's signature as grantee of the Final Environmental Covenant(s), whichever occurs last.
D.3	Indoor Air Sampling of all occupied buildings on the site	May-July 2019, 2020,2021
D.4	Performance Groundwater Monitoring Quarterly Performance Monitoring Biannual Performance Monitoring	June 2018 to June 2020 June 2018 to June 2019 June 2019 to June 2020
D.5	Decommission Bioremediation/Groundwater Recirculation system and monitoring wells	2020 to 2022 (if operation of bioremediation system is extended)
D.6	Soil Vapor Sampling	2020
D.7	Groundwater Confirmation Monitoring Quarterly Compliance Monitoring	2020-2024 June 2020 to June 2022
D.8	As Built Drawings and Report of vapor intrusion mitigation measures (vapor barrier and passive venting systems), and other engineering and institutional controls (if any).	Within 30 days of the City's receipt from the developer
D.9	Five Year Compliance Monitoring and Periodic Review reports	To follow Groundwater compliance monitoring (D.7). Groundwater monitoring required once every five years for the duration of the institutional controls on groundwater (if present) under the environmental covenant.

- 1) *Schedule is in calendar days. Deliverable due date may be modified with Ecology concurrence without amendment to the Consent Decree.*
- 2) *Project Plans include the following: Work Plan, Sampling and Analysis Plan, Quality Assurance Project Plan, and Health and Safety Plan, to be submitted for Ecology review and approval. All plans will include a schedule for implementation as applicable.*
- 3) *The Engineering Design Report includes: a Construction Quality Assurance Project Plan, a Compliance Monitoring and Contingency Response Plan, Proposed Best Management Practices, Water Quality Monitoring Plan, and Substantive Requirements of Procedurally Exempt Permits. Ecology will not approve the Final EDR until the required permits have been obtained.*