

**Travis Air Force Base  
Environmental Restoration Program  
Restoration Program Manager's  
Meeting Minutes  
17 June 2020, 0930 Hours**

Mr. Lonnie Duke of the Air Force Civil Engineer Center (AFCEC) Restoration Installation Support Section (ISS) conducted the Restoration Program Manager's (RPM) teleconference on 17 June 2020 at 0930 hours.

Effective 1 June 2020, the 60 AMW/CC at Travis AFB directed Health Protection Condition (HPCON) to Bravo (changed from HPCON Charlie) in response to the evolving COVID-19 public health situation in the local area. The base has cancelled all on-base gatherings of more than 10 people, and continues to encourage teleworking and virtual meetings in place of in-person meetings.

**All attendees participated via telephone or Microsoft TEAMS due to increased teleworking measures meant to reduce the number of employees on the base at one time. Attendees included:**

Lonnie Duke	AFCEC/CZOW
Glenn Anderson	AFCEC/CZOW
Monika O'Sullivan	AFCEC/CZOW
Chet Storrs	AFCEC/CZOW
Angel Santiago	AFCEC/CZOW
Gene Clare	AFCEC/CZOW
Lt Rachel Brinegar	Travis AFB/PA
Haekyung Kim	AFCEC/CZRW
Sarah Miller	USACE-Omaha
Paul Gedbaw	USACE-Omaha
Brian Boccellato	USACE-Omaha
Nadia Hollan Burke	EPA
Adriana Constantinescu	RWQCB
Dominique Forrester	DTSC
Kimiye Touchi	DTSC
Randall Bleichner	DTSC/Geological Services Unit
Mike Wray	CH2M/Jacobs
Leslie Royer	CH2M/Jacobs
Jill Dunphy	CH2M/Jacobs

Handouts distributed prior to the meeting included:

Attachment 1	Meeting Agenda
Attachment 2	Master Meeting and Document Schedule
Attachment 3	SBBGWTP Monthly Data Sheet (May 2020)
Attachment 4	CGWTP Monthly Data Sheet (May 2020)
Attachment 5	LF007C Monthly Data Sheet (May 2020)
Attachment 6	ST018 Monthly Data Sheet (May 2020)
Attachment 7	Program Update

## **1. ADMINISTRATIVE**

### **A. Previous Meeting Minutes**

Neither DTSC nor the Water Board had comments on the May 2020 Draft Meeting Minutes. Ms. Burke of EPA requested that the following bullet be added to the VOC/PFAS Biogeochemical Reactor Pilot Study discussion:

*Representatives from the regulatory agencies were enthusiastic about and supportive of the research, and are interested to hear the outcome of the pilot test.*

### **B. Action Item Review**

Action items from May 2020 were reviewed.

Action Item 1 is ongoing: Ms. O’Sullivan to provide updates on perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA). June 2020 update: Ms. O’Sullivan stated that the Air Force was scheduled to be sampling off-base as part of the Expanded Site Inspection by the end of June, but DoD has restricted travel to any state not yet meeting requirements for the green phase of reopening due to COVID-19. Because the majority of new cases are located in Southern California, they are requesting an exception for this very important sampling.

Ms. O’Sullivan noted that of the 11 sampling requests sent, occupants of the 6 properties located closest to the base have called to schedule the sampling. Mr. Duke said his team has driven past all 11 properties; many are not currently occupied or are only being used for grazing. Ms. Constantinescu commented that the Water Board will need information from all properties since it is known that the past occupants had wells, and these could be conduits for contamination. The Water Board can request sampling under the Porter-Cologne law. Ms. O’Sullivan said that

she will send what she can, while being mindful of Personally Identifiable Information. The Air Force asked everyone to continue to prioritize efforts related to this work.

Action Item 2 is ongoing: Mr. Duke will continue to provide design and construction information for the new KC-46 Hangar construction project. June 2020 update: Mr. Duke stated that the contractor has permission to work on the site and has already installed the construction fence. One building has already been demolished. A planned power outage will be scheduled while the building where the power is supplied from is demolished (a temporary source of power will be supplied).

Action Item 3 is ongoing: Include the progress of the optimized Emulsified Vegetable Oil (EVO) delivery via solar-powered organic carbon (SPOC) injection system pilot test at Site SS015 during future monthly program updates. June 2020 update: Ms. Royer said that the system is handling the small volumes of water being injected, but the team would like to see it handle a higher volume. They are considering extracting water at a consistent rate from an injection well and trying to inject that to see if results are better.

Action Item 4: Ms. Constantinescu will confer with Water Board Subject Matter Experts on whether the Air Force should proceed with collecting total bacteria samples along with TPH samples on the LF007C system influent and effluent during O&M sampling of the groundwater extraction treatment system. June 2020 update: Ms. Constantinescu has not yet had a chance to have this conversation, however is hopeful that she will have information for the Air Force by 30 June. This action item remains open.

Action Item 5: Ms. O'Sullivan will forward a figure showing off-base well locations and use to the Water Board. June 2020 update: Ms. O'Sullivan will forward what she has; the Water Board said they can obtain any additional needed information from the Department of water Resources. This action item remains open.

Action Item 6: Ms. Burke will forward news articles related to EPA perchlorate drinking water standards to the team. June 2020 update: Ms. Burke sent the requested item to Ms. Constantinescu and Mr. Anderson on 20 May 2020; this action item is now closed.

Action Item 7: Jacobs will review the chromatograms for TPH in May 2020 effluent samples from the LF007C Groundwater Treatment Plant. June 2020 update: Ms. Royer said that the detections were so low that they were essentially inconclusive, but when the chromatograms were exaggerated to show detail, they do not exhibit characteristic diesel-range organics (DRO) or motor-oil-range organics (MRO) patterns. She presented 3 slides supporting this discussion. Jacobs will continue to sample and look at the chromatograms to see if they support a biogenic origin, rather than petroleum. The USACE suggested doing a

matrix spike/matrix spike duplicate but with low-level spikes (25 or 50 ug/L) and see if there is matrix interference to help determine where site chromatograms fall compared to actual contaminants. This action item remains open.

Ms. Constantinescu requested that the due date for Action Item 4 be moved to 30 September 2020 considering this plan, and also suggested combining this action item with Action Item 4.

Ms. Dunphy took the action to make those changes for the July meeting; Ms. Royer took the action to send the 3 discussion slides to the Water Board.

### **C. Master Meeting and Document Schedule Review (see Attachment 2)**

The Travis AFB Master Meeting and Document Schedule (MMDS) was discussed during this meeting (see Attachment 2).

#### **Travis AFB Annual Meeting and Teleconference Schedule**

Mr. Anderson noted that all upcoming meetings will be held as Microsoft TEAMS teleconferences until California meets the requirements for the “green phase” of COVID-19 reopening; however, the MMDS will remain the same. Teammates will be notified if we will resume in-person meetings. The next RPM meeting is a teleconference scheduled for 15 July 2020 at 0930 PDT. The Restoration Advisory Board Meeting is scheduled for 22 October 2020; however it is also subject to COVID-19 restrictions.

#### **Travis AFB Master Document Schedule**

Mr. Anderson reminded the team that there is limited capability for producing document hard copies and CDs due to ongoing COVID-19 restrictions. For now, electronic versions of small documents will be emailed, and larger versions will be distributed via DOD SAFE. Hard copies and CDs cannot be made at the present time due to the CH2M/Jacobs offices being closed for COVID-19, with no access to reproduction equipment.

- Community Relations Plan Update (CRP): There was no change to the schedule. This document will be finished as soon as the other higher-priority documents are completed.
- Site SD031 Soil Remedial Investigation/Feasibility Study (RI/FS): The Response to Comments, Draft Final, and Final due dates remain TBD due to uncertainty with scheduling response-to-comments reviews. The Air Force sent responses to agency

comments on 6 May, as well as a redline version of the draft incorporating comments received earlier. DTSC and the Water Board will solicit input from their respective legal teams, EPA has the needed input from their legal team and will provide their comments to the Air Force. Mr. Anderson and Ms. Miller noted that there is a hard deadline for finalizing this document because it also must be invoiced and paid by 30 September.

- Potrero Hills Annex (FS, PP, and ROD): No change was made to the schedule. This project is overseen by the Water Board, but it is not yet an active CERCLA project. The team agreed to move this page to the end of the MMDS with a link to the Geotracker project page, and add it to the agenda when a discussion or update is necessary.
- Site FT004 POCO Corrective Action Plan: There was no change to the schedule. The Water Board will provide their comments by 30 June 2020.
- Quarterly Newsletter (October 2020): There was no change to the schedule. Mr. Anderson said he would like to convey to readers that the Environmental Restoration Program team adapted to restrictions from the COVID-19 pandemic to ensure work continued. He would like to include a “Brady Bunch” style screen capture of willing participants from our July Teams call. This issue will also announce the October 2020 RAB meeting.
- Initial Passive Vent Systems Evaluation Work Plan Technical Memorandum: The Response to Comments and Final due dates were changed to TBD due to outstanding unresolved issues with the Air Force responses to agency comments, requiring input from EPA subject matter experts. The EPA does not agree with not conducting indoor air sampling in the warehouse but said that the Air Force has what is necessary to finalize the document and proceed with this initial sample collection. The EPA might not be able to concur that the data can be used without indoor air sampling to evaluate risk. Mr. Anderson said the Air Force will finalize the document so that field work can proceed, and that discussions on next steps can happen once the data are in hand.
- Optimization Activities Technical Memorandum for Sites SD034 and SD037: The Response to Comments and Final Due Dates were changed to TBD. The Air Force submitted draft Responses to Comments and all agencies approved them, so the RTCs and document will be finalized. The submittal date will replace the TBDs on next month’s MMDS.
- Site SD043 Well Decommissioning and Site Closeout Technical Memorandum: The Draft to Agencies/RAB due date was changed to 27 May 2020 to reflect actual submittal date, and the Agency Comments Due date was changed to 26 June 2020. The Response to Comments and Final due date remained 29 July 2020. Ms. Touchi said she may need an extra few days to provide DTSC’s comments. Ms. Constantinescu said she will provide Water Board comments no later than 3 July 2020.

- 2019 Annual Groundwater Remediation Implementation Status Report (GRISR): There was no change to the schedule. Ms. Burke noted that the agencies will likely need more review time than is shown on the schedule. Mr. Anderson requested that the Air Force be kept informed of when the agencies will likely provide comments.
- 2019 Annual Corrective Action Management Unit Monitoring Report: All dates are currently TBD; Mr. Anderson noted that a schedule will be assigned soon but doesn't want review of this document to conflict with the 2019 GRISR and other higher priority documents.
- Site SS016 Soil Remedial Action Completion Report: The Predraft to Air Force Service Center was changed to 17 June 2020; the rest of the dates were changed accordingly.
- Site SD031B POCO Additional Site Work Plan: The Response to Comments and final due date were changed to 10 June 2020 to reflect the actual submittal date. This document will be moved to the History section next month.
- MOVED TO HISTORY:  
None

## 2. CURRENT PROJECTS

### Treatment Plant Operation and Maintenance Update

#### **South Base Boundary Groundwater Treatment Plant, May 2020 (see Attachment 3)**

The South Base Boundary Groundwater Treatment Plant (SBBGWTP) performed at 99.6% uptime, and 6.1 million gallons of groundwater were extracted and treated in May 2020. All treated water was discharged to Union Creek. The average flow rate for the SBBGWTP was 136.2 gallons per minute (gpm). Electrical power usage was 18,614 kilowatt hours (kWh), and approximately 15,374 pounds of CO<sub>2</sub> were created (based on DOE calculation). Approximately 0.92 of a pound of volatile organic compounds (VOCs) was removed in May. The total mass of VOCs removed since startup of the system is 527.1 pounds.

In May 2020, troubleshooting activities were performed on several extraction wells, and the backwash transfer pump and pump impeller were disassembled for cleaning to improve output, and reinstalled.

No optimization activities were conducted in May 2020.

#### **Central Groundwater Treatment Plant, May 2020 (see Attachment 4)**

The Central Groundwater Treatment Plant (CGWTP) performed at 100% uptime with approximately 971,950 gallons of groundwater extracted and treated in May 2020. All treated water was discharged to the storm sewer system which discharges to Union Creek. The average flow rate for the CGWTP was 21.9 gpm. Electrical power usage was 1,746 kWh for all equipment connected to the Central Plant, and approximately 2,180 pounds of CO<sub>2</sub> were generated. Approximately 1.93 pounds of VOCs were removed from groundwater by the treatment plant in May. The total mass of VOCs removed since the startup of the system is 11,549 pounds.

Two extraction wells were shut off on 16 May 2020 as a precautionary measure during installation of construction fencing related to the KC-46 hangar construction.

The Site SS016 subgrade biogeochemical reactor (SBGR), also known as a bioreactor, and the Site DP039 bioreactor, continued operating in May 2020.

No optimization activities occurred at the CGWTP in May 2020.

#### **LF007C Groundwater Treatment Plant, May 2020 (Attachment 5)**

The Subarea LF007C Groundwater Treatment Plant (LF007C GWTP) performed at 100% uptime with approximately 168,850 gallons of groundwater extracted and treated in May 2020. All treated water was discharged to the Duck Pond for beneficial reuse. The average flow rate was 3.8 gpm. Approximately  $9.57 \times 10^{-4}$  of a pound of VOCs was removed from groundwater by the treatment plant in May 2020. The total mass of VOCs removed since the startup of the system is 174.4 pounds. There was no electrical power usage statistics, because this plant operates on solar power only.

No optimization activities are reported for the month of May 2020.

NOTE: While the LF007C GWTP and extraction systems are still accessible for O&M, the monitoring wells located offbase are not currently accessible, because the Air Force's LF007C off-base easement has expired. The Air Force is working on getting a new easement, which has been complicated by a change of land ownership. Ms. Burke and Ms. Constantinescu offered regulatory agency support for getting access to the sites for sampling and groundwater elevation measurements if the Air Force continues to encounter difficulties in obtaining an access agreement.

#### **ST018 Groundwater (MTBE) Treatment Plant, May 2020 (see Attachment 6)**

Site ST018 (MTBE) Treatment Plant (ST018 GWTP) performed at 100% uptime with approximately 145,690 gallons of groundwater extracted in May 2020. All groundwater was discharged to the Fairfield – Suisun Sewer District. The average flow

rate for the ST018 GWTP was 3.3 gpm. Electrical power usage for the month was 79 kWh for all equipment connected to the ST018 GWTP. The total CO<sub>2</sub> discharge equivalent equates to approximately 58 pounds. Approximately 0.09 of a pound of MTBE, BTEX, VOCs, and TPH was removed in May by the treatment plant, and approximately 0.02 of a pound of MTBE-only was removed from groundwater. The total BTEX, MTBE and TPH mass removed since the startup of the system is 49.3 pounds, and the total MTBE mass removed since startup of the system is 12.1 pounds.

Note: Electrical power use at the ST018 GWTP is only for the alarm system and a pump that pushes influent tank water to the Fairfield-Suisun Sanitary Sewer line. The four groundwater extraction pumps in the system are all solar powered.

No optimization activities are reported for the month of May 2020.

### **3. Presentations:**

#### **A) Program Update: Activities Completed, In Progress, and Upcoming (see Attachment 7)**

Ms. Royer reported on the status of fieldwork and documents that have been completed, are in progress, or are upcoming. Please refer to Attachment 7 for the full briefing.

### **4. New Action Item Review**

1. Ms. Royer to continue reviewing the chromatograms for TPH in effluent samples from LF007C GWTP.
2. Ms. Dunphy to update the due date for Action Item 4 to 30 September 2020: Ms. Constantinescu to confer with her SMEs on whether the Air Force should proceed with collecting total bacteria samples along with TPH samples on the system influent and effluent during O&M sampling at LF007C groundwater extraction treatment system.
3. Ms. Royer will forward the 3 slides showing chromatograms at LF007C GWTP to Ms. Constantinescu.
4. Mr. Duke and Mr. Anderson will move the Potrero Hills page to the end of the MMDS, and include the Geotracker link.



## 5. PROGRAM ISSUES/UPDATE

Ms. O’Sullivan introduced Mr. Chet Storrs to the team, noting that he will be taking on more of her role with the PFAS investigations at Travis AFB, while her workload shifts to more contract management.

Ms. Touchi introduced Mr. Randall Bleichner to the team. He works in the Geological Services Unit of DTSC. In addition to her and Mr. Forrester, Mr. Bleichner will be reviewing reports and attending calls and meetings going forward.

Mr. Duke informed the team that the Optimized Remediation Contract process has officially started; there will be a regulatory engagement meeting in July to outline performance objectives and periods of performance. They hope to be able to have the meeting in person, but it will likely be held via MS Teams. He added that although not required, section leaders and other management are welcome to attend, if available. Ms. Burke said that she has participated in similar meetings for her Base Realignment and Closure (BRAC) sites, and suggested having the most recent GRISR in hand for a good sense of the status of the sites; however, Mr. Duke added that the meeting won’t likely be that technical.

## 6. ACTION ITEMS

Item #	Responsible	Action Item Description	Due Date	Status
1.	Monika O’Sullivan	Ms. O’Sullivan to provide updates on PFOS and PFOA as she becomes aware of them.	Ongoing	Open
2.	Lonnie Duke	Mr. Duke will continue to provide construction updates for the KC-46 Hangar. This project was awarded to Walsh Construction and is being managed by a contracting element of the Navy.	Ongoing	Open
3.	Mr. Wray and Ms. Royer	Mr. Wray or Ms. Royer to include the progress of the optimized EVO delivery via solar-powered organic carbon injection system pilot test at	Ongoing	Open

		Site SS015 during future monthly program updates.		
4.	Ms. Constantinescu and Ms. Royer	Ms. Constantinescu will confer with Water Board SMEs on whether the Air Force should proceed with collecting total bacteria samples along with TPH samples on the system influent and effluent during O&M sampling at LF007C groundwater extraction treatment system. Ms. Royer will continue to review the chromatograms for TPH in effluent samples from LF007C GWTP	30 September 2020	Open
5.	Ms. Royer	Ms., Royer will forward the 3 slides showing chromatograms at LF007C GWTP to Ms. Constantinescu	15 July 2020	Open
6.	Mr. Duke, Mr. Anderson	Mr. Duke and Mr. Anderson will move the Potrero Hills page to the end of the MMDS, and include the Geotracker link.	15 July 2020	Open

TRAVIS AIR FORCE BASE  
ENVIRONMENTAL RESTORATION PROGRAM  
RESTORATION PROGRAM MANAGER'S MEETING

The RPM Teleconference is scheduled for 9:30 AM PST on 17 June 2020. **The call-in number will be provided in the MS Teams meeting invite and also in the same email that the meeting materials are provided in. If you are able to participate via MS Teams meeting, you will see the shared documents that will be viewable by all participants.**

AGENDA

1. ADMINISTRATIVE

- A. INTRODUCTIONS
- B. PREVIOUS MEETING MINUTES
- C. ACTION ITEM REVIEW
- D. MASTER MEETING AND DOCUMENT SCHEDULE REVIEW

2. CURRENT PROJECTS

TREATMENT PLANT OPERATION AND MAINTENANCE UPDATE

3. PRESENTATIONS

PROGRAM UPDATE:

DOCUMENTS & ACTIVITIES COMPLETED, IN PROGRESS & PLANNED

4. NEW ACTION ITEM REVIEW

5. PROGRAM/ISSUES/UPDATE

NOTES: AFTER THE RPM TELECONFERENCE, BASED ON THE DISCUSSION DURING THE REVIEW OF THE MASTER MEETING AND DOCUMENT SCHEDULE, WE WILL ALLOW TIME TO HOLD A SEPARATE SPLINTER MEETING TO DISCUSS RESPONSES TO AGENCY COMMENTS ON THOSE DOCUMENTS THAT ARE IN PROGRESS, OR OTHER ISSUES IF NEEDED. ALL PARTICIPANTS ARE WELCOME TO PARTICIPATE.

**(2020)**  
**Annual Meeting and Teleconference Schedule**

<b>Monthly RPM Meeting<sup>1</sup></b> <b>(Begins at time noted)</b>	<b>RPM Teleconference</b> <b>(Begins at time noted)</b>	<b>Restoration Advisory Board</b> <b>Meeting</b> <b>(Begins at 7:00 p.m.)</b> <b>(Poster Session at 6:30 p.m.)</b>
—	01-15-20	—
02-19-20	—	—
—	03-18-20	—
04-16-20 (Thursday 1:00 PM)	—	<del>04-16-20</del>
—	05-20-20	—
06-17-20	—	—
—	07-15-20	—
08-26-20	—	—
—	09-16-20	—
10-22-20 (Thursday 2:00 PM)	—	10-22-20
—	11-18-20	—
—	—	—

<sup>1</sup> Note: Meetings and teleconferences will be held at 09:30 AM on the third Wednesday of each month unless otherwise noted.

<sup>2</sup> Note: Tentative RAB tour(s) during construction season.

## Travis AFB Master Meeting and Document Schedule

PRIMARY DOCUMENTS		
Life Cycle	Community Relations Plan Update Travis AFB, Glenn Anderson CH2M, Jill Dunphy	Site SD031 Soil Remedial Investigation/Feasibility Study Travis AFB, Glenn Anderson CH2M, Rick Sturm
<b>Scoping Meeting</b>	NA	NA
Predraft to AF/Service Center	08-23-16	05-24-19
AF/Service Center Comments Due	09-07-16	06-10-19
Draft to Agencies / RAB	09-28-16 (03-22-18)	09-12-19
Agency Comments Due	10-28-16 (04-27-18)	11-12-19 (01-14-20)
<b>Response to Comments Meeting</b>	<b>TBD</b>	<b>TBD</b>
Agency Concurrence with Remedy	NA	NA
Public Comment Period	NA	NA
<b>Public Meeting</b>	<b>NA</b>	<b>NA</b>
Response to Comments Due	TBD	TBD
Draft Final Due	TBD	TBD
Final Due	TBD	TBD

## Travis AFB Master Meeting and Document Schedule

PRIMARY DOCUMENTS			
Life Cycle	Potrero Hills Annex Travis, Glenn Anderson		
	FS	Proposed Plan	ROD
<b>Scoping Meeting</b>	<b>180 days after Water Board Order Rescinded</b>	<b>+470 days</b>	<b>+735 days</b>
Predraft to AF/Service Center	+ 270 days	+530 days	+ 915 days
AF/Service Center Comments Due	+ 300 days	+560 days	+ 975 days
Draft to Agencies	+330 days	+590 days	+ 1035 days
Draft to RAB	+ 330 days	+590 days	+ 1035 days
Agency Comments Due	+390 days	+650 days	+ 1095 days
<b>Response to Comments Meeting</b>	<b>+ 405 days</b>	<b>+665 days</b>	<b>+ 1110 days</b>
Agency Concurrence with Remedy	NA	NA	+ 1130 days
Public Comment Period	NA	+735 to 765 days	NA
<b>Public Meeting</b>	<b>NA</b>	<b>+745 days</b>	<b>NA</b>
Response to Comments Due	+430 days	+695days	+ 1190 days
Draft Final Due	+430 days	+695 days	+ 1190 days
Final Due	+460 days	+725 days	+ 1250 days

## Travis AFB Master Meeting and Document Schedule

SECONDARY DOCUMENTS	
Life Cycle	Site FT004 POCO Corrective Action Plan Travis AFB, Glenn Anderson CH2M, Doug Berwick CAPE, Meg Greenwald
<b>Scoping Meeting</b>	NA
Predraft to AF/Service Center	03-20-20
AF/Service Center Comments Due	04-20-20
Draft to Agencies / RAB	04-29-20
Agency Comments Due	05-29-20
<b>Response to Comments Meeting</b>	<b>06-17-20</b>
Response to Comments Due	07-01-20
Draft Final Due	NA
Final Due	07-01-20
Public Comment Period	NA
<b>Public Meeting</b>	NA

## Travis AFB Master Meeting and Document Schedule

INFORMATIONAL DOCUMENTS			
Life Cycle	Quarterly Newsletter (October 2020) Travis, Glenn Anderson	Initial Passive Vent Systems Sampling Work Plan Tech Memo Travis AFB, Glenn Anderson CH2M, Leslie Royer	Optimization Activities Technical Memorandum for Sites SD034 and SD037 Travis AFB, Glenn Anderson CH2M, Levi Pratt
<b>Scoping Meeting</b>	NA	NA	NA
Predraft to AF/Service Center	09-08-20	12-16-19	01-20-20
AF/Service Center Comments Due	NA	12-31-19	02-20-20
Draft to Agencies / RAB	09-15-20	01-09-20	04-03-20
Agency Comments Due	09-29-20	02-10-20	05-04-20
<b>Response to Comments Meeting</b>	<b>10-01-20</b>	<b>02-19-20</b>	<b>05-20-20</b>
Response to Comments Due	10-06-20	03-04-20 (TBD)	06-01-20 (TBD)
Draft Final Due	NA	NA	NA
Final Due	10-08-20	03-04-20 (TBD)	06-01-20 (TBD)
Public Comment Period	NA	NA	NA
<b>Public Meeting</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>



## Travis AFB Master Meeting and Document Schedule

INFORMATIONAL DOCUMENTS				
Life Cycle	Site SD043 Well Decommissioning and Site Closeout Technical Memorandum Travis AFB, Glenn Anderson CH2M, Levi Pratt	2019 Annual GRISR Travis AFB, Glenn Anderson CH2M, Levi Pratt	2019 Annual CAMU Monitoring Report Travis AFB, Gene Clare CH2M HILL, Levi Pratt	Site SS016 Soil Remedial Action Completion Report Travis AFB, Glenn Anderson CH2M, Doug Berwick CAPE, Meg Greenwald
<b>Scoping Meeting</b>	NA	NA	NA	NA
Predraft to AF/Service Center	04-06-20	05-04-20	TBD	06-17-20
AF/Service Center Comments Due	05-06-20	06-04-20	TBD	07-20-20
Draft to Agencies / RAB	05-27-20	06-22-20	TBD	08-04-20
Agency Comments Due	06-26-20	07-23-20	TBD	09-03-20
<b>Response to Comments Meeting</b>	<b>07-15-20</b>	<b>08-05-20</b>	<b>TBD</b>	<b>09-16-20</b>
Response to Comments Due	07-29-20	08-21-20	TBD	09-30-20
Draft Final Due	NA	NA	NA	NA
Final Due	07-29-20	08-21-20	TBD	09-30-20
Public Comment Period	NA	NA	NA	NA
<b>Public Meeting</b>	NA	NA	NA	NA

## Travis AFB Master Meeting and Document Schedule

INFORMATIONAL DOCUMENTS	
Life Cycle	Site SD031B POCO Additional Site Investigation Work Plan Travis, Glenn Anderson CH2M, Tony Chakurian
<b>Scoping Meeting</b>	NA
Predraft to AF/Service Center	12-18-19
AF/Service Center Comments Due	01-20-20
Draft to Agencies / RAB	03-02-20
Agency Comments Due	04-01-20
<b>Response to Comments Meeting</b>	<b>04-16-20</b>
Response to Comments Due	06-10-20
Draft Final Due	NA
Final Due	06-10-20
Public Comment Period	NA
<b>Public Meeting</b>	NA

# South Base Boundary Groundwater Treatment Plant

## Monthly Data Sheet

Report Number: 235

Reporting Period: 1 May 2020 – 1 June 2020

Date Submitted: 12 June 2020

This monthly data sheet presents information regarding the South Base Boundary Groundwater Treatment Plant (SBBGWTP) and associated remedial process optimization (RPO) activities.

## System Metrics

Table 1 presents operational data from the May 2020 reporting period.

Table 1 – Operations Summary – May 2020				
Initial Data Collection:		5/1/2020 10:30	Final Data Collection:	6/1/2020 13:10
Operating Time:		Percent Uptime:	Electrical Power Usage:	
SBBGWTP:	744 hours	SBBGWTP:	99.6%	SBBGWTP: 18,614 kWh (15,374 lbs CO <sub>2</sub> generated <sup>a</sup> )
Gallons Treated: <b>6.1 million gallons</b>			Gallons Treated Since July 1998: <b>1.2 billion gallons</b>	
Volume Discharged to Union Creek: <b>6.1 million gallons</b>			Gallons Treated from Other Sources: <b>0 gallons</b>	
VOC Mass Removed: <b>0.92 lbs<sup>b</sup></b>			VOC Mass Removed Since July 1998: <b>527.1 lbs</b>	
Rolling 12-Month Cost per Pound of Mass Removed: <b>\$22,620<sup>c</sup></b>				
Monthly Cost per Pound of Mass Removed: <b>\$25,777<sup>c</sup></b>				
lbs = pounds				
<sup>a</sup> SiteWise™ estimate that 1 kilowatt hour generated produces 0.74 pounds of GHG. Value also includes approximately 1,600 pounds of GHG from GAC change out services averaged to a per month basis.				
<sup>b</sup> Calculated using May 2020 EPA Method SW8260C analytical results.				
<sup>c</sup> Costs include operations and maintenance, carbon change out, reporting, analytical laboratory, project management, and utility costs related to operation of the system.				

Table 2 presents individual extraction well flow rates along with the average system flow during the monthly reporting period.

Table 2 – SBBGWTP Average Flow Rate (gpm) <sup>a</sup> – May 2020							
FT005 <sup>b</sup>				SS029		SS030	
EW01x05	Offline	EW743x05	Offline	EW01x29	Offline <sup>c</sup>	EW01x30	12.1
EW02x05	Offline	EW744x05	Offline <sup>d</sup>	EW02x29	Offline <sup>c</sup>	EW02x30	Offline
EW03x05	Offline	EW745x05	9.9	EW03x29	Offline <sup>d</sup>	EW03x30	Offline
EW731x05	6.6	EW746x05	Offline	EW04x29	8.0	EW04x30	16.4
EW732x05	Offline	EW2291x05	6.0	EW05x29	8.0	EW05x30	7.0
EW733x05	Offline	EW2782x05	4.5	EW06x29	1.1	EW2174x30	8.2
EW734x05	1.1	EW2783x05	2.0	EW07x29	12.4	EW711x30	3.6
EW735x05	7.7	EW2784x05	9.8			MW269x30	Offline <sup>d</sup>
EW736x05	Offline	EW2785x05	7.7				
EW737x05	Offline	EW2786x05	13.2				
EW742x05	Offline						
FT005 Total: 68.5				SS029 Total: 29.5		SS030 Total: 47.3	
SBBGWTP Average Monthly Flow <sup>e</sup> : 136.2 gpm							
<sup>a</sup> Flow rates presented are instantaneous measurements taken at the end of the reporting period.							
<sup>b</sup> Most extraction wells at FT005 were taken offline in accordance with the 2008 Annual Remedial Process Optimization Report for the Central Groundwater Treatment Plant, North Groundwater Treatment Plant, and South Base Boundary Groundwater Treatment Plant.							
<sup>c</sup> Extraction wells taken off line because of persistent fouling of the well pumps and associated discharge piping.							
<sup>d</sup> Extraction wells were operational; however, well was recharging.							
<sup>e</sup> The average SBBGWTP groundwater flow rate was calculated using the Union Creek Discharge Totalizer and dividing it by the total time the system was operational.							
gpm – gallons per minute							
SBBGWTP – South Base Boundary Groundwater Treatment Plant							

Table 3 presents a summary of system shutdowns during the monthly reporting period.

Table 3 – Summary of System Shutdowns					
Location	Shutdown <sup>a</sup>		Restart <sup>a</sup>		Cause
	Date	Time	Date	Time	
SBBGWTP	14 May 2020	9:00	14 May 2020	12:00	Backwashed both 6,000-lb GAC vessels
<sup>a</sup> Shutdown and restart times estimated based on field notes SBBGWTP = South Base Boundary Groundwater Treatment Plant					

## Summary of O&M Activities

Monthly groundwater treatment samples were collected at the SBBGWTP on 4 May 2020. Sample results are presented in Table 4. The total VOC concentration (18.10 µg/L) in the influent sample increased from the April 2020 sample results (16.21 µg/L). TCE was the primary VOC detected in the influent sample at a concentration of 17 µg/L. Chloroform, cis-1,2-DCE and TCE were detected in the midpoint sampling location. In addition, cis-1,2-DCE and TCE were detected in the effluent sample at concentrations less than effluent limitations.

Figure 1 presents a plot of influent VOC concentrations and average flow at the SBBGWTP over the past twelve (12) months. An overall decreasing trend was observed for the VOC influent concentrations in the past 12 months. An overall decreasing flow rate trend was also observed in the past 12 months.

In May 2020 troubleshooting was performed on several extraction wells. The following list presents the maintenance activities and status of those extraction wells:

- EW744x05 – The transducer communication wire was replaced. Well is currently on line.
- EW735x05 - The totalizer cartridge was replaced. Well is currently on line.
- EW02x30 – A replacement motor starter and overload will be installed for EW02x30 in the beginning of June 2020. Well is currently off line.
- EW03x30 – Motor loads may have possibly tripped. Well is currently off line.
- EW2174x30 – A replacement starter and overload from EW02x30 was used to replace the burned out overload. Well is on line.

In May 2020, the backwash transfer pump was disassembled and cleaned to improve its output. The pump impeller was cleaned of scale and reinstalled. Cleaning this pump did not result in system downtime.

## Optimization Activities

No optimization activities occurred at the SBBGWTP in May 2020.

## Sustainability

Travis AFB is committed to decreasing the amount of GHG produced directly (waste streams discharging GHG) or indirectly (GHG produced as related to electrical energy consumption) from all systems across Travis AFB. Travis AFB continues to optimize each treatment plant to reduce the amount of electrical energy consumed, and to implement sustainable treatment plant optimization programs, such as taking extraction pumps off line that are no longer necessary for contaminant plume capture.

Figure 2 presents the historical GHG production from the SBBGWTP. In May 2020, the SBBGWTP produced approximately 15,374 pounds of GHG, which includes approximately 1,600 pounds of GHG generated from GAC change out services averaged to a per month basis.

**TABLE 4**

Summary of Groundwater Analytical Data for May 2020 – South Base Boundary Groundwater Treatment Plant

Summary of Groundwater Analytical Data for May 2020 – South Base Boundary Groundwater Treatment Plant						
Constituent	Instantaneous Maximum <sup>a</sup> (µg/L)	Detection Limit (µg/L)	N/C	4 May 2020 (µg/L)		
				Influent	Midpoint	Effluent <sup>b</sup>
Halogenated Volatile Organics						
Acetone	NA	1.9	0	ND	ND	ND
Bromodichloromethane	NA	0.17	0	ND	ND	ND
Chloroform	1.9	0.16	0	ND	0.22 J	ND
Chloromethane	NA	0.30	0	ND	ND	ND
1,1-Dichloroethane	0.50	0.22	0	ND	ND	ND
1,2-Dichloroethane	0.50	0.13	0	ND	ND	ND
1,1-Dichloroethene	0.50	0.23	0	ND	ND	ND
cis-1,2-Dichloroethene	0.50	0.15	0	1.1	1.8	0.34 J
trans-1,2-Dichloroethene	0.50	0.11	0	ND	ND	ND
Dichlorodifluoromethane	NA	0.31	0	ND	ND	ND
Tetrachloroethene	0.50	0.20	0	ND	ND	ND
1,1,1-Trichloroethane	0.50	0.16	0	ND	ND	ND
1,1,2-Trichloroethane	0.50	0.27	0	ND	ND	ND
Trichloroethene	0.65	0.16	0	17	1.2	0.2 J
Vinyl Chloride	0.90	0.10	0	ND	ND	ND
Non-Halogenated Volatile Organics						
Benzene	0.50	0.13	0	ND	ND	ND
Ethylbenzene	0.50	0.15	0	ND	ND	ND
Toluene	0.50	0.25	0	ND	ND	ND
Xylenes	0.50	0.10 – 0.18	0	ND	ND	ND
Other						
Total Petroleum Hydrocarbons – Gasoline	50	10	0	NM	NM	ND
Total Petroleum Hydrocarbons – Diesel	50	5.5	0	NM	NM	ND
Total Petroleum Hydrocarbons – Motor Oil	100	32	0	NM	NM	ND

<sup>a</sup> In accordance with current National Pollutant Discharge Elimination System permit number CAG912002, Order number R2-2017-0048.

<sup>b</sup> Concentrations in **bold** exceeded discharge limits.

Notes:

J = analyte concentration is considered an estimated value due to a detected concentration value between the reporting limit and method detection limit for the contaminant.

NA = not applicable

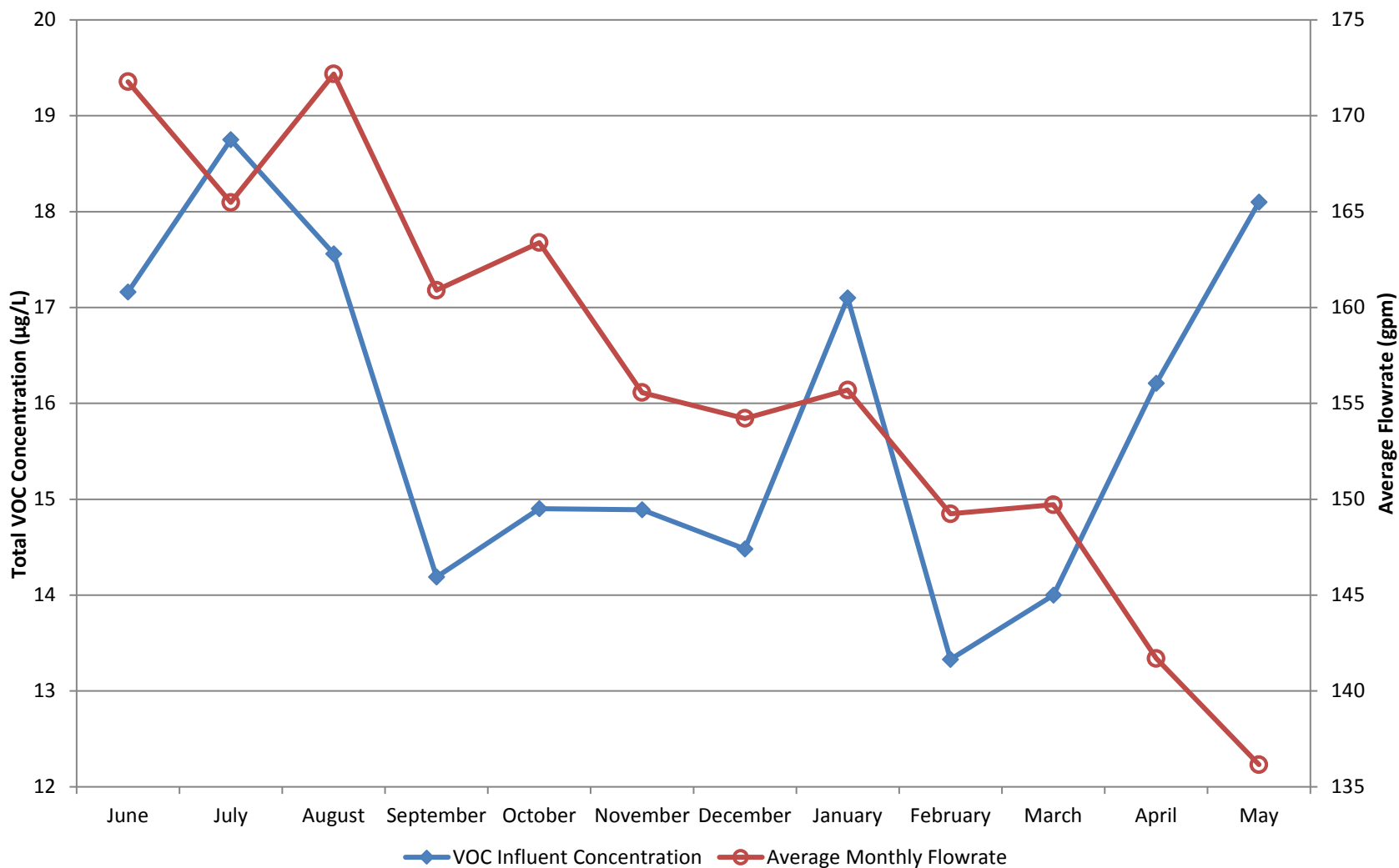
N/C = number of samples out of compliance with discharge limits.

ND = not detected

NM = not measured

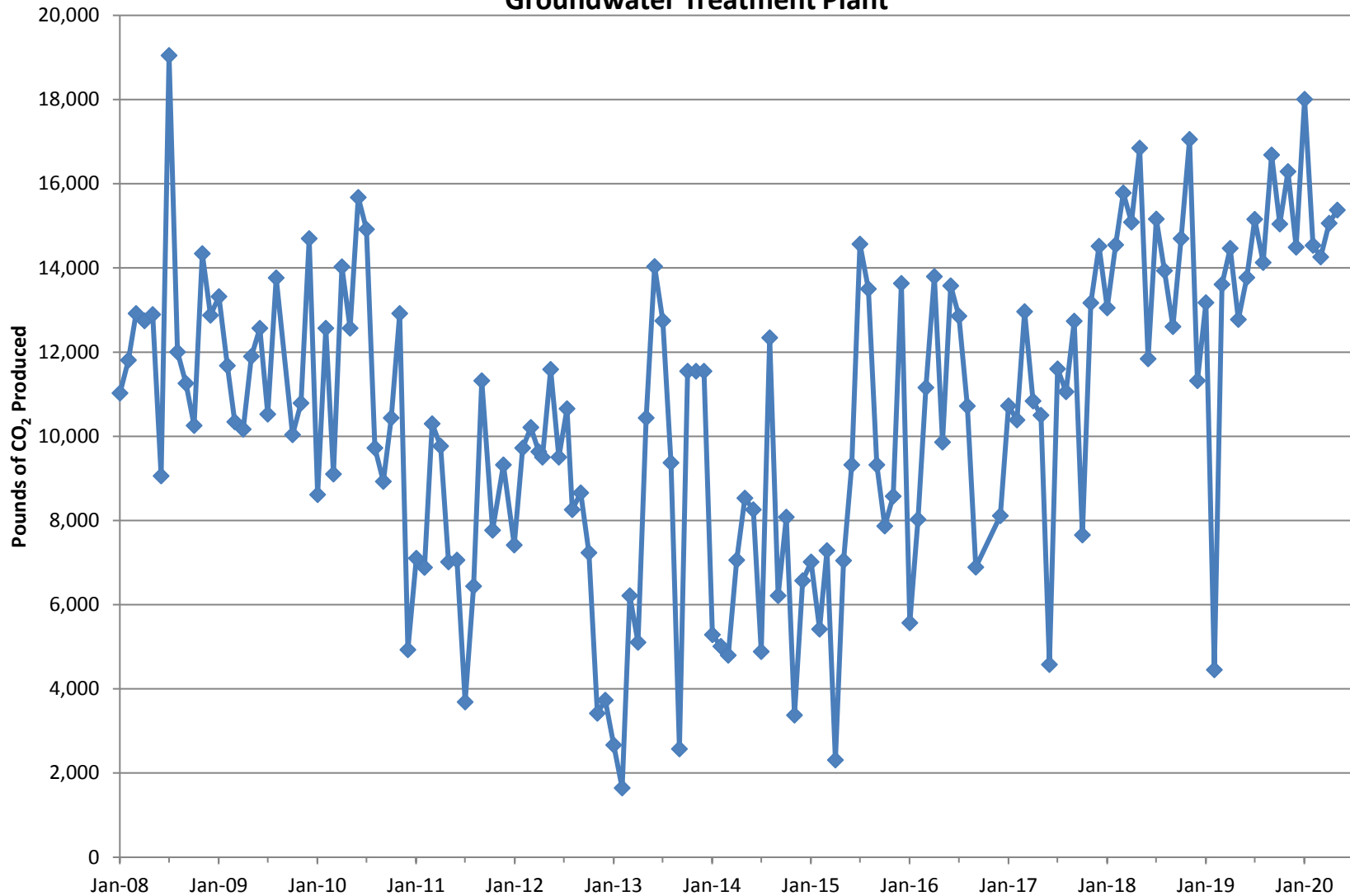
µg/L = micrograms per liter

**Figure 1**  
**SBBGWTP Total VOC Influent Concentrations and Average Flowrate Twelve Month History**



**Figure 2**

**Equivalent Pounds of Carbon Dioxide Produced by the South Base Boundary  
Groundwater Treatment Plant**





# Central Groundwater Treatment Plant Monthly Data Sheet

Report Number: 250

Reporting Period: 1 May 2020 – 1 June 2020

Date Submitted: 12 June 2020

This monthly data sheet presents information regarding the Central Groundwater Treatment Plant (CGWTP) and its associated technology demonstrations. The ongoing technology demonstrations related to the CGWTP include various emulsified vegetable oil (EVO) injections and two (2) bioreactor treatability studies.

## System Metrics

Table 1 presents operational data from the May 2020 reporting period.

Table 1 – Operations Summary – May 2020			
Initial Data Collection:	5/1/2020 11:50	Final Data Collection:	6/1/2020 9:20
Operating Time:		Percent Uptime:	Electrical Power Usage:
CGWTP:	742 hours	CGWTP:	100%
		CGWTP:	1,746 kWh (2,180 lbs CO <sub>2</sub> generated <sup>a</sup> )
Gallons Treated (discharge to storm sewer):		Gallons Treated Since January 1996:	<b>583.0 million gallons</b>
<b>971,950 gallons</b>			
VOC Mass Removed from groundwater:		VOC Mass Removed Since January 1996:	
<b>1.93 lbs<sup>b</sup></b>		<b>2,863 lbs from groundwater</b>	
		<b>8,686 lbs from vapor</b>	
Rolling 12-Month Cost per Pound of Mass Removed: \$2,270 <sup>c</sup>			
Monthly Cost per Pound of Mass Removed: \$2,638 <sup>c</sup>			
<sup>a</sup> SiteWise™ estimate that 1 kilowatt hour generated produces 0.74 pounds of GHG. Value also includes approximately 888 pounds of GHG from GAC change out services averaged to a per month basis.			
<sup>b</sup> Calculated using May 2020 EPA Method SW8260C analytical results.			
<sup>c</sup> Costs include operations and maintenance, carbon change out, reporting, analytical laboratory, project management, and utility costs related to operation of the system.			

Table 2 presents individual extraction well flow rates during the monthly reporting period.

Table 2 – CGWTP Average Flow Rates <sup>a</sup> – May 2020	
Location	Average Flow Rate Groundwater (gpm)
EW001x16	11.5
EW002x16	6.9
EW003x16 <sup>b</sup>	0.5
EW605x16	4.7 <sup>c</sup>
EW610x16	1.5 <sup>c</sup>
CGWTP	21.9
<sup>a</sup> Flow rates calculated by dividing total gallons processed by system operating time for the month or the average of the instantaneous readings.	
<sup>b</sup> Extracted groundwater from EW003x16 is treated in Site SS016 bioreactor.	
<sup>c</sup> EW605x16 and EW610x16 were offline for construction	
gpm = gallons per minute	

Table 3 presents a summary of shutdowns during the monthly reporting period.

<b>Table 3 – Summary of System Shutdowns</b>					
<b>Location</b>	<b>Shutdown<sup>a</sup></b>		<b>Restart</b>		<b>Cause</b>
	<b>Date</b>	<b>Time</b>	<b>Date</b>	<b>Time</b>	
CGWTP	None	--	--	--	--
-- = Date/Time not recorded					
<sup>a</sup> Shutdown and restart times estimated based on field notes					
CGWTP = Central Groundwater Treatment Plant					

## Summary of O&M Activities

Monthly groundwater treatment samples were collected at the CGWTP on 4 May 2020. Sample results are presented in Table 4. The total VOC concentration (238.04 µg/L) in the May 2020 influent sample has decreased from the April 2020 sample (269.62 µg/L). TCE was the primary VOC detected in the influent sample at a concentration of 190 µg/L. No VOCs were detected in the samples collected after the first and second carbon vessels; however, bromomethane was detected (0.36 J+ µg/L) in the effluent sample. There are no discharge limits for bromomethane so none were exceeded. Travis AFB will continue to monitor influent, midpoint, and effluent concentrations at the CGWTP for carbon breakthrough, though the carbon treatment remained effective in May 2020.

Figure 1 presents a plot of influent concentrations (total VOCs) and the influent flow rate at the CGWTP versus time for the past twelve (12) months. The influent concentrations show a slight increasing trend over the past 12 months along with a decreasing trend for the flow rate through the treatment plant.

EW605x16 and EW610x16 were both shut off on 16 May 2020 as a precautionary measure during installation of construction fencing in the Oil Spill Area (OSA). Groundwater conveyance lines are located in the area where the construction fencing is being installed. In the unlikely event that a conveyance line was hit during installation activities, keeping these pumps off line would minimize the potential spill of untreated groundwater. Both of these pumps remained off line for the remainder of the reporting period.

The Site SS016 subgrade biogeochemical reactor (SBGR), also known as the bioreactor and the Site DP039 bioreactor, continued operating in May 2020.

## Optimization Activities

No optimization activities occurred at the CGWTP in May 2020.

## Sustainability

Travis AFB is committed to decreasing the amount of GHG produced directly (waste streams discharging GHG) or indirectly (GHG produced as related to electrical energy consumption) from all systems across Travis AFB. Travis AFB continues to optimize each treatment plant to reduce the amount of electrical energy consumed, and to implement sustainable treatment plant optimization programs, such as bioreactors and EVO injection well networks.

Figure 2 presents the historical GHG production from the systems associated with the CGWTP. The CGWTP produced approximately 2,180 pounds of GHG during May 2020.

TABLE 4

Summary of Groundwater Analytical Data for May 2020 – Central Groundwater Treatment Plant

				4 May 2020 (µg/L)			
Constituent	Instantaneous Maximum <sup>a</sup> (µg/L)	Detection Limit (µg/L)	N/C	Influent	After Carbon 1 Effluent	After Carbon 2 Effluent	System Effluent <sup>b</sup>
Halogenated Volatile Organics							
Acetone	NA	1.9 – 3.8	0	ND	ND	ND	ND
Bromomethane	NA	0.21 – 0.42	0	ND	ND	ND	0.36 J+
Carbon disulfide	NA	0.17	0	ND	ND	ND	ND
Chloroform	1.9	0.16 – 0.32	0	ND	ND	ND	ND
Chloromethane	NA	0.30 – 0.60	0	ND	ND	ND	ND
1,2-Dichlorobenzene	NA	0.15 – 0.30	0	0.32 J	ND	ND	ND
1,3-Dichlorobenzene	NA	0.13 – 0.26	0	0.36 J	ND	ND	ND
1,4-Dichlorobenzene	NA	0.16 – 0.32	0	0.18 J	ND	ND	ND
Bromodichloromethane	NA	0.17 – 0.34	0	ND	ND	ND	ND
1,1-Dichloroethane	0.50	0.22 – 0.44	0	ND	ND	ND	ND
1,2-Dichloroethane	0.50	0.13 – 0.26	0	ND	ND	ND	ND
1,1-Dichloroethene	0.50	0.23 – 0.46	0	0.61 J	ND	ND	ND
cis-1,2-Dichloroethene	0.50	0.15 – 0.30	0	43	ND	ND	ND
trans-1,2-Dichloroethene	0.50	0.15 – 0.30	0	2.7	ND	ND	ND
Tetrachloroethene	0.50	0.20 – 0.40	0	0.51 J	ND	ND	ND
1,1,1-Trichloroethane	0.50	0.16 – 0.32	0	ND	ND	ND	ND
1,1,2-Trichloroethane	0.50	0.27 – 0.54	0	ND	ND	ND	ND
Trichloroethene	0.65	0.16 – 0.32	0	190	ND	ND	ND
Vinyl Chloride	0.90	0.10 – 0.20	0	ND	ND	ND	ND
Non-Halogenated Volatile Organics							
Benzene	0.50	0.16 – 0.32	0	ND	ND	ND	ND
Ethylbenzene	0.50	0.16 – 0.32	0	ND	ND	ND	ND
Toluene	0.50	0.17 – 0.34	0	ND	ND	ND	ND
Total Xylenes	0.50	0.15 – 0.38	0	ND	ND	ND	ND
Other							
Total Petroleum Hydrocarbons – Gasoline (C6 – C10)	50	10	0	NM	NM	NM	ND
Total Petroleum Hydrocarbons – Diesel (C10 – C28)	50	5.5	0	NM	NM	NM	ND
Total Petroleum Hydrocarbons – Motor Oil (C28 – C40)	100	32	0	NM	NM	NM	ND

<sup>a</sup> In accordance with current National Pollutant Discharge Elimination System permit number CAG912002, Order number R2-2017-0048.

<sup>b</sup> Concentrations in **bold** exceeded discharge limits

Notes:

J = analyte concentration is considered an estimated value due to a detected concentration value between the reporting limit and method detection limit for the contaminant.

J+ = analyte concentration is considered a biased high estimated value.

NA = not applicable

N/C = number of samples out of compliance with discharge limits.

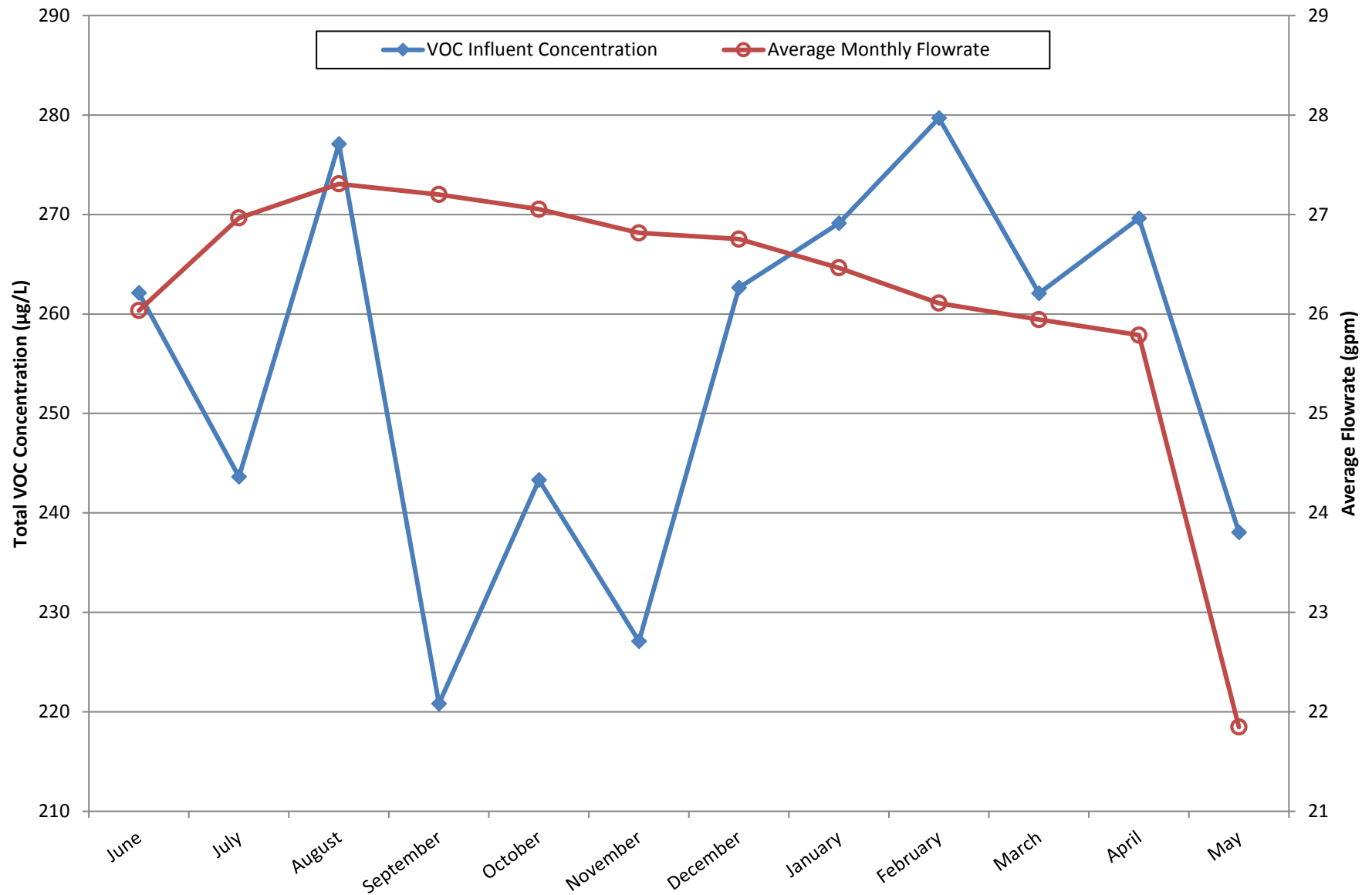
ND = not detected

NM = not measured

µg/L = micrograms per liter

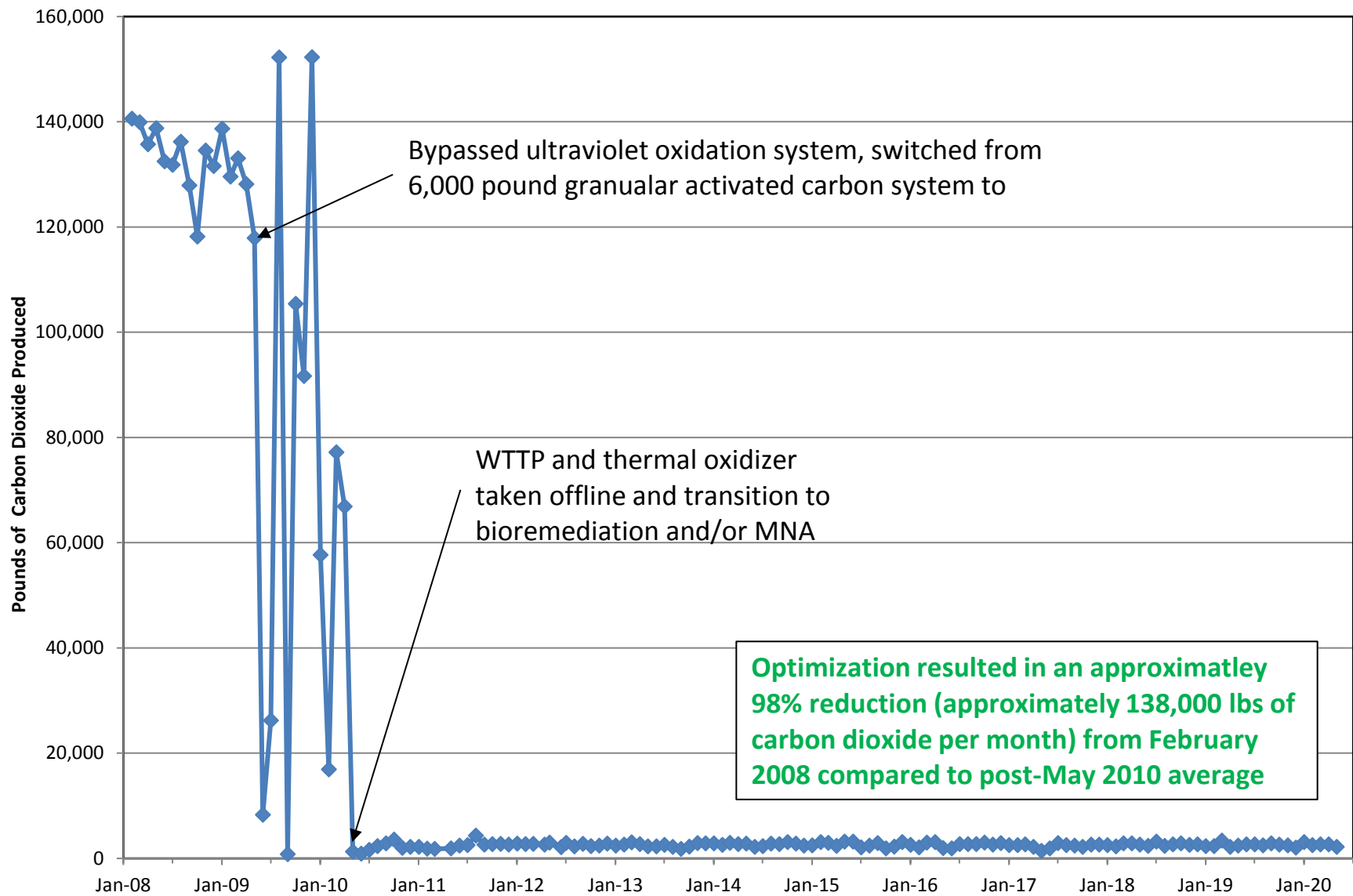
**Figure 1**

**CGWTP Total VOC Influent Concentrations and Average Flowrate Twelve Month History**



**Figure 2**

**Equivalent Pounds of Carbon Dioxide Produced by the Central Groundwater Treatment Plant**



# Central Groundwater Treatment Plant Monthly Data Sheet

Report Number: 250

Reporting Period: 1 May 2020 – 1 June 2020

Date Submitted: 12 June 2020

This monthly data sheet presents information regarding the Central Groundwater Treatment Plant (CGWTP) and its associated technology demonstrations. The ongoing technology demonstrations related to the CGWTP include various emulsified vegetable oil (EVO) injections and two (2) bioreactor treatability studies.

## System Metrics

Table 1 presents operational data from the May 2020 reporting period.

Table 1 – Operations Summary – May 2020				
Initial Data Collection:		5/1/2020 11:50	Final Data Collection:	6/1/2020 9:20
Operating Time:		Percent Uptime:		Electrical Power Usage:
CGWTP:	742 hours	CGWTP:	100%	CGWTP: 1,746 kWh (2,180 lbs CO <sub>2</sub> generated <sup>a</sup> )
Gallons Treated (discharge to storm sewer):		Gallons Treated Since January 1996: <b>583.0 million gallons</b>		
<b>971,950 gallons</b>				
VOC Mass Removed from groundwater:		VOC Mass Removed Since January 1996:		
<b>1.93 lbs<sup>b</sup></b>		<b>2,863 lbs from groundwater</b>		
		<b>8,686 lbs from vapor</b>		
Rolling 12-Month Cost per Pound of Mass Removed: \$2,270 <sup>c</sup>				
Monthly Cost per Pound of Mass Removed: \$2,638 <sup>c</sup>				
<sup>a</sup> SiteWise™ estimate that 1 kilowatt hour generated produces 0.74 pounds of GHG. Value also includes approximately 888 pounds of GHG from GAC change out services averaged to a per month basis.				
<sup>b</sup> Calculated using May 2020 EPA Method SW8260C analytical results.				
<sup>c</sup> Costs include operations and maintenance, carbon change out, reporting, analytical laboratory, project management, and utility costs related to operation of the system.				

Table 2 presents individual extraction well flow rates during the monthly reporting period.

Table 2 – CGWTP Average Flow Rates <sup>a</sup> – May 2020	
Location	Average Flow Rate Groundwater (gpm)
EW001x16	11.5
EW002x16	6.9
EW003x16 <sup>b</sup>	0.5
EW605x16	4.7 <sup>c</sup>
EW610x16	1.5 <sup>c</sup>
CGWTP	21.9
<sup>a</sup> Flow rates calculated by dividing total gallons processed by system operating time for the month or the average of the instantaneous readings.	
<sup>b</sup> Extracted groundwater from EW003x16 is treated in Site SS016 bioreactor.	
<sup>c</sup> EW605x16 and EW610x16 were offline for construction	
gpm = gallons per minute	

Table 3 presents a summary of shutdowns during the monthly reporting period.

<b>Table 3 – Summary of System Shutdowns</b>					
<b>Location</b>	<b>Shutdown<sup>a</sup></b>		<b>Restart</b>		<b>Cause</b>
	<b>Date</b>	<b>Time</b>	<b>Date</b>	<b>Time</b>	
CGWTP	None	--	--	--	--
-- = Date/Time not recorded					
<sup>a</sup> Shutdown and restart times estimated based on field notes					
CGWTP = Central Groundwater Treatment Plant					

## Summary of O&M Activities

Monthly groundwater treatment samples were collected at the CGWTP on 4 May 2020. Sample results are presented in Table 4. The total VOC concentration (238.04 µg/L) in the May 2020 influent sample has decreased from the April 2020 sample (269.62 µg/L). TCE was the primary VOC detected in the influent sample at a concentration of 190 µg/L. No VOCs were detected in the samples collected after the first and second carbon vessels; however, bromomethane was detected (0.36 J+ µg/L) in the effluent sample. There are no discharge limits for bromomethane so none were exceeded. Travis AFB will continue to monitor influent, midpoint, and effluent concentrations at the CGWTP for carbon breakthrough, though the carbon treatment remained effective in May 2020.

Figure 1 presents a plot of influent concentrations (total VOCs) and the influent flow rate at the CGWTP versus time for the past twelve (12) months. The influent concentrations show a slight increasing trend over the past 12 months along with a decreasing trend for the flow rate through the treatment plant.

EW605x16 and EW610x16 were both shut off on 16 May 2020 as a precautionary measure during installation of construction fencing in the Oil Spill Area (OSA). Groundwater conveyance lines are located in the area where the construction fencing is being installed. In the unlikely event that a conveyance line was hit during installation activities, keeping these pumps off line would minimize the potential spill of untreated groundwater. Both of these pumps remained off line for the remainder of the reporting period.

The Site SS016 subgrade biogeochemical reactor (SBGR), also known as the bioreactor and the Site DP039 bioreactor, continued operating in May 2020.

## Optimization Activities

No optimization activities occurred at the CGWTP in May 2020.

## Sustainability

Travis AFB is committed to decreasing the amount of GHG produced directly (waste streams discharging GHG) or indirectly (GHG produced as related to electrical energy consumption) from all systems across Travis AFB. Travis AFB continues to optimize each treatment plant to reduce the amount of electrical energy consumed, and to implement sustainable treatment plant optimization programs, such as bioreactors and EVO injection well networks.

Figure 2 presents the historical GHG production from the systems associated with the CGWTP. The CGWTP produced approximately 2,180 pounds of GHG during May 2020.

TABLE 4

Summary of Groundwater Analytical Data for May 2020 – Central Groundwater Treatment Plant

				4 May 2020 (µg/L)			
Constituent	Instantaneous Maximum <sup>a</sup> (µg/L)	Detection Limit (µg/L)	N/C	Influent	After Carbon 1 Effluent	After Carbon 2 Effluent	System Effluent <sup>b</sup>
Halogenated Volatile Organics							
Acetone	NA	1.9 – 3.8	0	ND	ND	ND	ND
Bromomethane	NA	0.21 – 0.42	0	ND	ND	ND	0.36 J+
Carbon disulfide	NA	0.17	0	ND	ND	ND	ND
Chloroform	1.9	0.16 – 0.32	0	ND	ND	ND	ND
Chloromethane	NA	0.30 – 0.60	0	ND	ND	ND	ND
1,2-Dichlorobenzene	NA	0.15 – 0.30	0	0.32 J	ND	ND	ND
1,3-Dichlorobenzene	NA	0.13 – 0.26	0	0.36 J	ND	ND	ND
1,4-Dichlorobenzene	NA	0.16 – 0.32	0	0.18 J	ND	ND	ND
Bromodichloromethane	NA	0.17 – 0.34	0	ND	ND	ND	ND
1,1-Dichloroethane	0.50	0.22 – 0.44	0	ND	ND	ND	ND
1,2-Dichloroethane	0.50	0.13 – 0.26	0	ND	ND	ND	ND
1,1-Dichloroethene	0.50	0.23 – 0.46	0	0.61 J	ND	ND	ND
cis-1,2-Dichloroethene	0.50	0.15 – 0.30	0	43	ND	ND	ND
trans-1,2-Dichloroethene	0.50	0.15 – 0.30	0	2.7	ND	ND	ND
Tetrachloroethene	0.50	0.20 – 0.40	0	0.51 J	ND	ND	ND
1,1,1-Trichloroethane	0.50	0.16 – 0.32	0	ND	ND	ND	ND
1,1,2-Trichloroethane	0.50	0.27 – 0.54	0	ND	ND	ND	ND
Trichloroethene	0.65	0.16 – 0.32	0	190	ND	ND	ND
Vinyl Chloride	0.90	0.10 – 0.20	0	ND	ND	ND	ND
Non-Halogenated Volatile Organics							
Benzene	0.50	0.16 – 0.32	0	ND	ND	ND	ND
Ethylbenzene	0.50	0.16 – 0.32	0	ND	ND	ND	ND
Toluene	0.50	0.17 – 0.34	0	ND	ND	ND	ND
Total Xylenes	0.50	0.15 – 0.38	0	ND	ND	ND	ND
Other							
Total Petroleum Hydrocarbons – Gasoline (C6 – C10)	50	10	0	NM	NM	NM	ND
Total Petroleum Hydrocarbons – Diesel (C10 – C28)	50	5.5	0	NM	NM	NM	ND
Total Petroleum Hydrocarbons – Motor Oil (C28 – C40)	100	32	0	NM	NM	NM	ND

<sup>a</sup> In accordance with current National Pollutant Discharge Elimination System permit number CAG912002, Order number R2-2017-0048.

<sup>b</sup> Concentrations in **bold** exceeded discharge limits

Notes:

J = analyte concentration is considered an estimated value due to a detected concentration value between the reporting limit and method detection limit for the contaminant.

J+ = analyte concentration is considered a biased high estimated value.

NA = not applicable

N/C = number of samples out of compliance with discharge limits.

ND = not detected

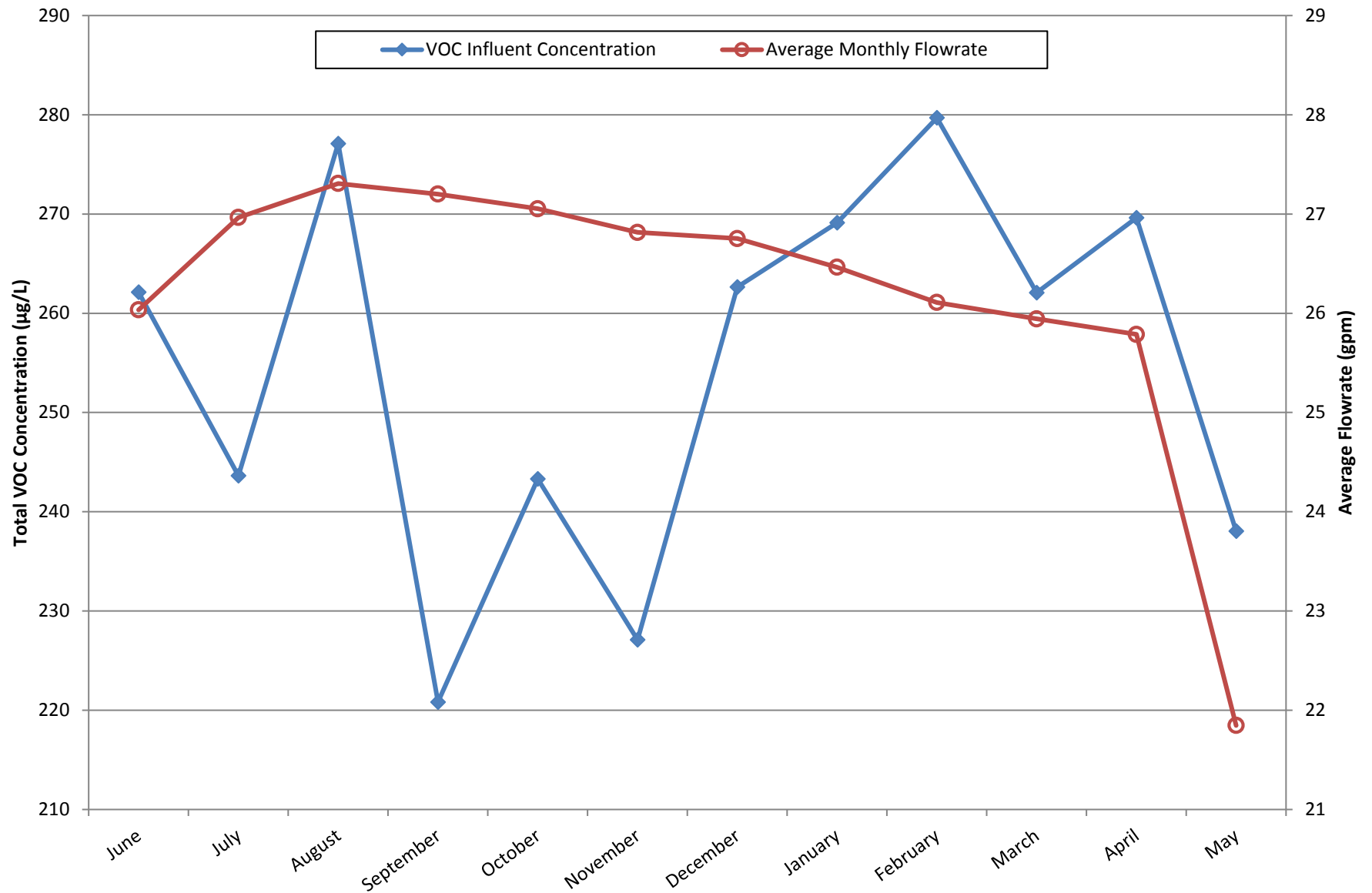
NM = not measured

µg/L = micrograms per liter



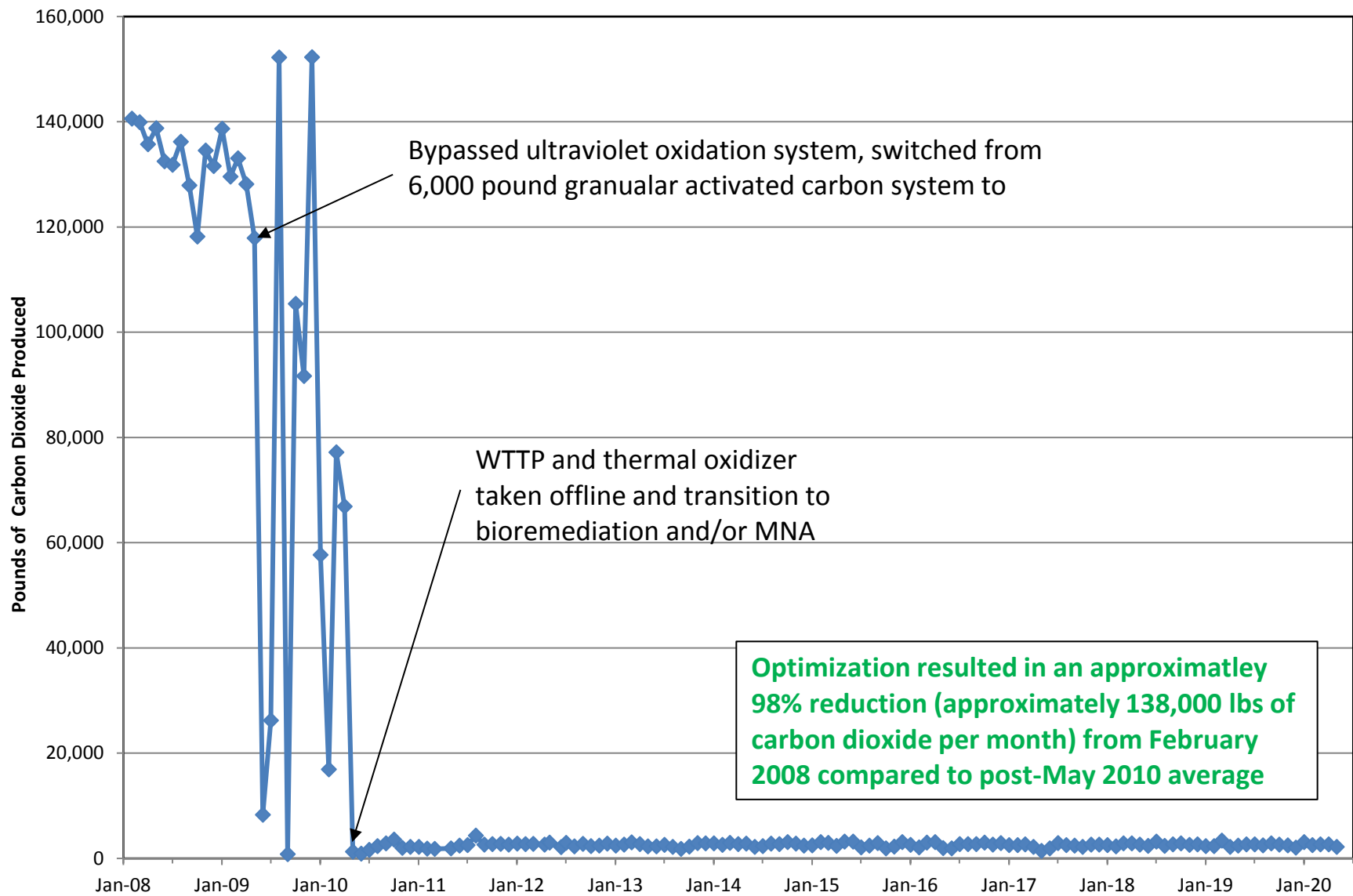
**Figure 1**

**CGWTP Total VOC Influent Concentrations and Average Flowrate Twelve Month History**



**Figure 2**

**Equivalent Pounds of Carbon Dioxide Produced by the Central Groundwater Treatment Plant**



# Subarea LF007C Groundwater Treatment Plant

## Monthly Data Sheet

Report Number: 189

Reporting Period: 1 May 2020 – 1 June 2020

Date Submitted: 12 June 2020

This monthly data sheet presents information regarding the Subarea LF007C Groundwater Treatment Plant (LF007C GWTP) and associated remedial process optimization (RPO) activities.

### System Metrics

Table 1 presents operational data from the May 2020 reporting period:

Table 1 – Operations Summary – May 2020			
Initial Data Collection:	5/1/2020 12:10	Final Data Collection:	6/1/2020 11:10
Operating Time:	Percent Uptime:	Electrical Power Usage <sup>a</sup> :	
LF007C GWTP: 743 hours	LF007C GWTP 100%	LF007C GWTP: 0 kWh	
Gallons Treated: <b>168,850 gallons</b>		Gallons Treated Since March 2000: <b>90.3 million gallons</b>	
Volume Discharged to Duck Pond: <b>168,850 gallons</b>			
VOC Mass Removed: <b>9.57 x 10<sup>-4</sup> pounds<sup>b</sup></b>		VOC Mass Removed Since March 2000: <b>174.4 pounds (Groundwater)</b>	
Rolling 12-Month Cost per Pound of Mass Removed: <b>Not Measured<sup>c</sup></b>			
Monthly Cost per Pound of Mass Removed: <b>Not Measured<sup>c</sup></b>			
<sup>a</sup> The LF007C GWTP operates on solar power only.			
<sup>b</sup> VOCs from May 2020 influent sample detected by EPA Method SW8260C.			
<sup>c</sup> Value not calculated since measurement does not accurately represent the cost effectiveness of the system.			

Table 2 presents individual extraction well flow rates during the monthly reporting period.

Table 2 – LF007C GWTP Average and Total Flow Rates – May 2020		
Location	Average Flow Rate (gpm) <sup>a</sup>	Total Gallons Processed (gallons)
EW614x07	3.4	152,040 <sup>b</sup>
EW615x07	0.6	25,585
LF007C GWTP	3.8	168,850
<sup>a</sup> Flow rates calculated by dividing total gallons processed by system operating time for the month or the average of the instantaneous readings.		
<sup>b</sup> The extraction pump takes in air from the subsurface, which alters the flow and totalizer. An air-release valve was installed on 12 November 2019 to help minimize the effects on the system.		
gpm = gallons per minute		

Table 3 presents a summary of shutdowns during the monthly reporting period.

Table 3 – Summary of System Shutdowns					
Location	Shutdown <sup>a</sup>		Restart <sup>a</sup>		Cause
	Date	Time	Date	Time	
LF007C GWTP	None	--	--	--	
-- = Time not recorded <sup>a</sup> Shutdown and restart times estimated based on field notes LF007C GWTP = Subarea LF007C Groundwater Treatment Plant					

## Summary of O&M Activities

Monthly groundwater samples were collected at the LF007C GWTP on 4 May 2020. Sample results are presented in Table 4. The total VOC concentration in the May 2020 influent sample was 0.68 µg/L. TCE was the only VOC detected at the influent sample location. No other VOCs were detected in the midpoint and effluent sample locations. In addition, TPH-d and TPH-motor oil were detected in the effluent sample location at concentrations of 43 µg/L and 63 J µg/L, respectively, which are less than their effluent limitations (50 µg/L and 100 µg/L).

Figure 1 presents a chart of influent concentrations (total VOCs) at the LF007C GWTP versus time for the past twelve (12) months. VOC concentrations, primarily TCE, have been seasonally variable; however, over the last 12 months the trend has been increasing. The average flow rate through the LF007C GWTP has decreased over the last 12 months.

## Optimization Activities

No optimization activities occurred at the LF007C GWTP in May 2020.

## Sustainability

Travis AFB is committed to decreasing the amount of GHG produced directly (waste streams discharging GHG) or indirectly (GHG produced as related to electrical energy consumption) from all systems across Travis AFB. Travis AFB continues to optimize each treatment plant to reduce the amount of electrical energy consumed, and to implement sustainable treatment plant optimization programs, such as the solar arrays employed to power the system.

Figure 2 presents the historical GHG production from the systems associated with the NGWTP and LF007C GWTP. The LF007C GWTP is a solar-only operated treatment system and does not generate GHG, with exception of a small amount of GHG generated from changing out the GAC averaged to a per month basis.

TABLE 4

Summary of Groundwater Analytical Data for May 2020 – Subarea LF007C Groundwater Treatment Plant

Constituent	Instantaneous Maximum <sup>a</sup> (µg/L)	Detection Limit (µg/L)	N/C	4 May 2020 (µg/L)		
				Influent	After Carbon 1	Effluent <sup>b</sup>
Halogenated Volatile Organics						
Acetone	NA	2.1	0	ND	ND	ND
Bromodichloromethane	5.0	0.29	0	ND	ND	ND
Bromoform	5.0	0.10	0	ND	ND	ND
2-Butanone	5.0	0.35	0	ND	ND	ND
Carbon Tetrachloride	0.5	0.15	0	ND	ND	ND
Chloroform	5.0	0.12	0	ND	ND	ND
Chloromethane	NA	0.30	0	ND	ND	ND
Dibromochloromethane	5.0	0.13	0	ND	ND	ND
Dichlorodifluoromethane	NA	0.31	0	ND	ND	ND
1,3-Dichlorobenzene	5.0	0.11	0	ND	ND	ND
1,4-Dichlorobenzene	5.0	0.13	0	ND	ND	ND
1,1-Dichloroethane	5.0	0.15	0	ND	ND	ND
1,2-Dichloroethane	0.5	0.22	0	ND	ND	ND
1,1-Dichloroethene	5.0	0.14	0	ND	ND	ND
cis-1,2-Dichloroethene	5.0	0.10	0	ND	ND	ND
trans-1,2-Dichloroethene	5.0	0.11	0	ND	ND	ND
Methylene Chloride	5.0	0.35	0	ND	ND	ND
Tetrachloroethene	5.0	0.15	0	ND	ND	ND
1,1,1-Trichloroethane	5.0	0.19	0	ND	ND	ND
1,1,2-Trichloroethane	5.0	0.31	0	ND	ND	ND
Trichloroethene	5.0	0.13	0	0.68 J	ND	ND
Vinyl Chloride	0.5	0.22	0	ND	ND	ND
Non-Halogenated Volatile Organics						
Benzene	1.0	0.13	0	ND	ND	ND
Ethylbenzene	5.0	0.15	0	ND	ND	ND
Toluene	5.0	0.25	0	ND	ND	ND
Xylenes	5.0	0.10 – 0.18	0	ND	ND	ND
Other						
Total Petroleum Hydrocarbons – Gasoline	50	10	0	NM	NM	ND
Total Petroleum Hydrocarbons – Diesel	50	5.5	0	NM	NM	43
Total Petroleum Hydrocarbons – Motor Oil	100	32	0	NM	NM	63 J

<sup>a</sup> In accordance with current National Pollutant Discharge Elimination System permit number CAG912002, Order number R2-2017-0048.<sup>b</sup> Concentrations in **bold** exceeded discharge limits

Notes:

J = analyte concentration is considered an estimated value due to a detected concentration value between the reporting limit and method detection limit for the contaminant.

NA = not applicable

N/C = number of samples out of compliance with discharge limits.

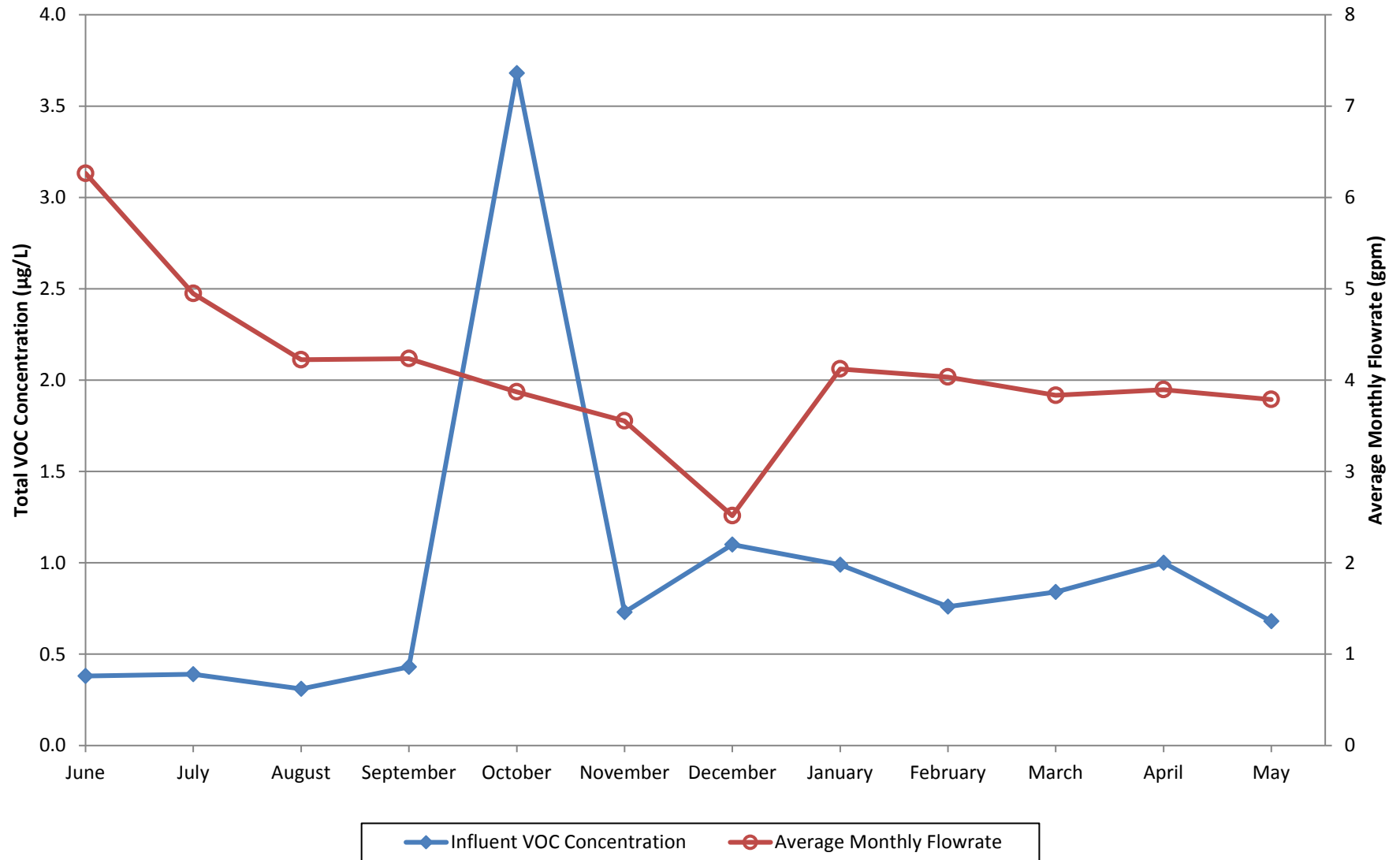
ND = not detected

NM = not measured

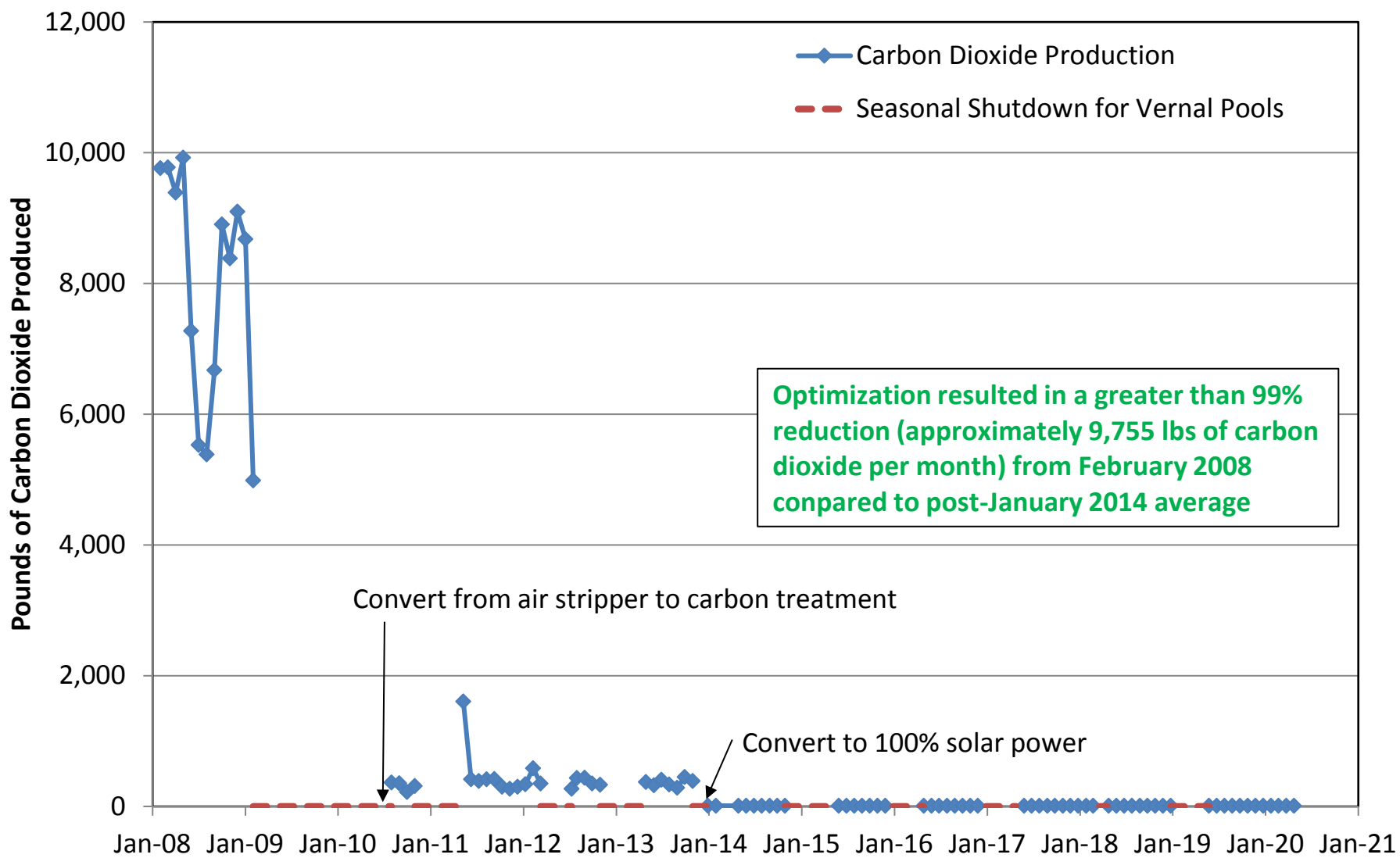
µg/L = micrograms per liter

**Figure 1**

**LF007CGWTP Total VOC Influent Concentrations and Average Flowrate Twelve Month History**



**Figure 2**  
**Equivalent Pounds of Carbon Dioxide Produced by the NGWTP/LF007C GWTP**



Note: Dashed line represents seasonal shutdowns due to the presence of vernal pools at Site LF007C during which no carbon dioxide production occurred.

# Site ST018 Groundwater Treatment Plant

## Monthly Data Sheet

Report Number: 111

Reporting Period: 1 May 2020 – 1 June 2020

Date Submitted: 12 June 2020

This monthly data sheet presents information regarding the Site ST018 Groundwater Treatment Plant (ST018GWTP).

### System Metrics

Table 1 presents operation data from the May 2020 reporting period.

Table 1 – Operations Summary – May 2020			
Initial Data Collection: 5/1/2020 11:15		Final Data Collection: 6/1/2020 12:45	
Operating Time:		Percent Uptime:	
ST018GWTP: 743 hours		ST018GWTP: 100%	
		ST018GWTP: 79 kWh (58 lbs CO <sub>2</sub> generated <sup>a</sup> )	
Gallons Extracted: 145,690 gallons		Gallons Extracted Since March 2011: 19.2 million gallons	
Volume Discharged to Sanitary Sewer: 145,690 gallons		Final Totalizer Reading: 19,178,509 gallons	
Cumulative Volume Discharged to Sanitary Sewer since 1 November 2014: 12.7 million gallons			
MTBE, BTEX, VOC, TPH Mass Removed: 0.09 lbs <sup>b</sup>		MTBE, BTEX, VOC, TPH Mass Removed Since March 2011: 49.3 lbs	
MTBE (Only) Removed: 0.02 lbs <sup>b</sup>		MTBE (Only) Mass Removed Since March 2011: 12.1 lbs	
Rolling 12-Month Cost per Total Pounds of Mass Removed: \$35,746 <sup>bc</sup>			
Monthly Cost per Pound of Mass Removed: \$58,316 <sup>bc</sup>			
<sup>a</sup> SiteWise™ estimate that 1 kilowatt hour generated produces 0.74 pounds of GHG.			
<sup>b</sup> Calculated using May 2020 EPA Method SW8260C and SW8015B analytical results.			
<sup>c</sup> Costs include operations and maintenance, reporting, analytical laboratory, project management, and utility costs related to operation of the system.			
kWh = kilowatt hour			
lbs = pounds			



Table 2 presents individual extraction well flow rates along with the average system flow during the monthly reporting period.

<b>Table 2 – ST018GWTP Average Flow Rates – May 2020</b>		
<b>Location</b>	<b>Average Flow Rate Groundwater (gpm)<sup>a</sup></b>	<b>Hours of Operation</b>
EW2014x18	2.3	743
EW2016x18	0.2	743
EW2019x18	0.0	Offline <sup>b</sup>
EW2333x18	2.3	743
ST018GWTP	3.3	743
<sup>a</sup> Flow rates calculated by dividing total gallons processed by amount of operating time of the pump/system. <sup>b</sup> Extraction well was turned off with regulatory approval on 25 November 2019 because of low MTBE concentrations. gpm = gallons per minute ST018GWTP = Site ST018 Groundwater Treatment Plant		

Table 3 presents a summary of shutdowns during the monthly reporting period.

<b>Table 3 – Summary of System Shutdowns</b>					
<b>Location</b>	<b>Shutdown<sup>a</sup></b>		<b>Restart<sup>a</sup></b>		<b>Cause</b>
	<b>Date</b>	<b>Time</b>	<b>Date</b>	<b>Time</b>	
CGWTP	None.	--		--	
-- = Time not recorded <sup>a</sup> Shutdown and restart times estimated based on field notes ST018GWTP = Site ST018 Groundwater Treatment Plant					

## Summary of O&M Activities

Monthly groundwater discharge samples were collected at the ST018GWTP on 4 May 2020. Because the extracted groundwater is no longer treated with carbon prior to discharge to the sanitary sewer, only discharge samples are now collected, rather than influent and effluent samples. Results are presented in Table 4. The complete May 2020 laboratory data report is available upon request. The MTBE discharge concentration during the May 2020 sampling event was 18 µg/L, which is an increase from the April 2020 sample result of 15 µg/L. A number of other fuel-related constituents were also detected in the system discharge sample and are listed in Table 4.

The Fairfield-Suisun Sewer District does not currently have a discharge limit for MTBE, but a limit of 6,400 µg/L is advised based on worker health and safety. Travis AFB will continue to monitor discharge contaminant concentrations to maintain compliance with the Fairfield-Suisun Sewer District discharge permit.

Figure 1 presents plots of the average flow rate and total extracted contaminant (MTBE, TPH-g, TPH-d, TPH-mo, BTEX, and VOCs) and extracted MTBE concentrations at the ST018GWTP over the past twelve (12) months. The average flow rate through the ST018GWTP has been cyclical with typical flow rates decreasing during the dry season (summer and fall) and increasing during the rainy season (winter and spring). The overall average flow rates in the past 12 months show a decreasing trend, which is partially attributed to the

shutdown of EW2019x18 in November 2019. The extracted MTBE concentrations and extracted total concentrations have generally been fluctuating over the past 12 months also with an overall decreasing trend.

## **Optimization Activities**

No optimization activities occurred at the ST018GWTP in May 2020.

## **Sustainability**

Travis AFB is committed to decreasing the amount of GHG produced directly (waste streams discharging GHG) or indirectly (GHG produced as related to electrical energy consumption) from all systems across Travis AFB. Travis AFB continues to optimize each treatment plant to reduce the amount of electrical energy consumed, and to implement sustainable treatment plant optimization programs, such as the solar arrays employed to power a majority of the ST018GWTP system.

Figure 2 presents the historical GHG production from the ST018GWTP. The ST018GWTP produced 58 pounds of GHG during May 2020 and removed 145,690 gallons of water. The amount of GHG produced is directly attributed to the amount of water removed through the system because the only line-power electrical use is for a transfer pump to push the water from the system to the sanitary sewer.

TABLE 4

Summary of Groundwater Analytical Data for May 2020 – Site ST018 Groundwater Treatment Plant

Summary of Groundwater Quality Data for May 2020 - Site C100 Groundwater Treatment Plant				
Constituent	Instantaneous Maximum <sup>a</sup> (µg/L)	Detection Limit (µg/L)	N/C	4 May 2020 (µg/L)
				System Discharge <sup>b</sup>
Fuel Related Constituents				
Methyl tert-Butyl Ether	6,400	0.25	0	18
Benzene	25,000 <sup>c</sup>	0.16	0	0.17 J
Ethylbenzene	25,000 <sup>c</sup>	0.16	0	ND
Toluene	25,000 <sup>c</sup>	0.17	0	ND
Total Xylenes	25,000 <sup>c</sup>	0.19 – 0.34	0	ND
Total Petroleum Hydrocarbons – Gasoline	50,000 <sup>d</sup>	10	0	17 J
Total Petroleum Hydrocarbons – Diesel	50,000 <sup>d</sup>	15	0	24 J
Total Petroleum Hydrocarbons – Motor Oil	100,000	160	0	ND
Other				
Acetone	NA	1.9	0	ND
1,2-Dichloroethane	20	0.13	0	ND
Isopropylbenzene	NA	0.19	0	ND
Naphthalene	NA	0.22	0	ND
N-Propylbenzene	NA	0.16	0	ND

<sup>a</sup> In accordance with the Fairfield-Suisun Sewer District Discharge Limitations<sup>b</sup> Concentrations in **bold** exceeded discharge limits<sup>c</sup> The limit of 25,000 µg/L is a combined limit for BTEX.<sup>d</sup> The limit of 50,000 µg/L is a combined limit for TPH-g and TPH-d.

µg/L = micrograms per liter

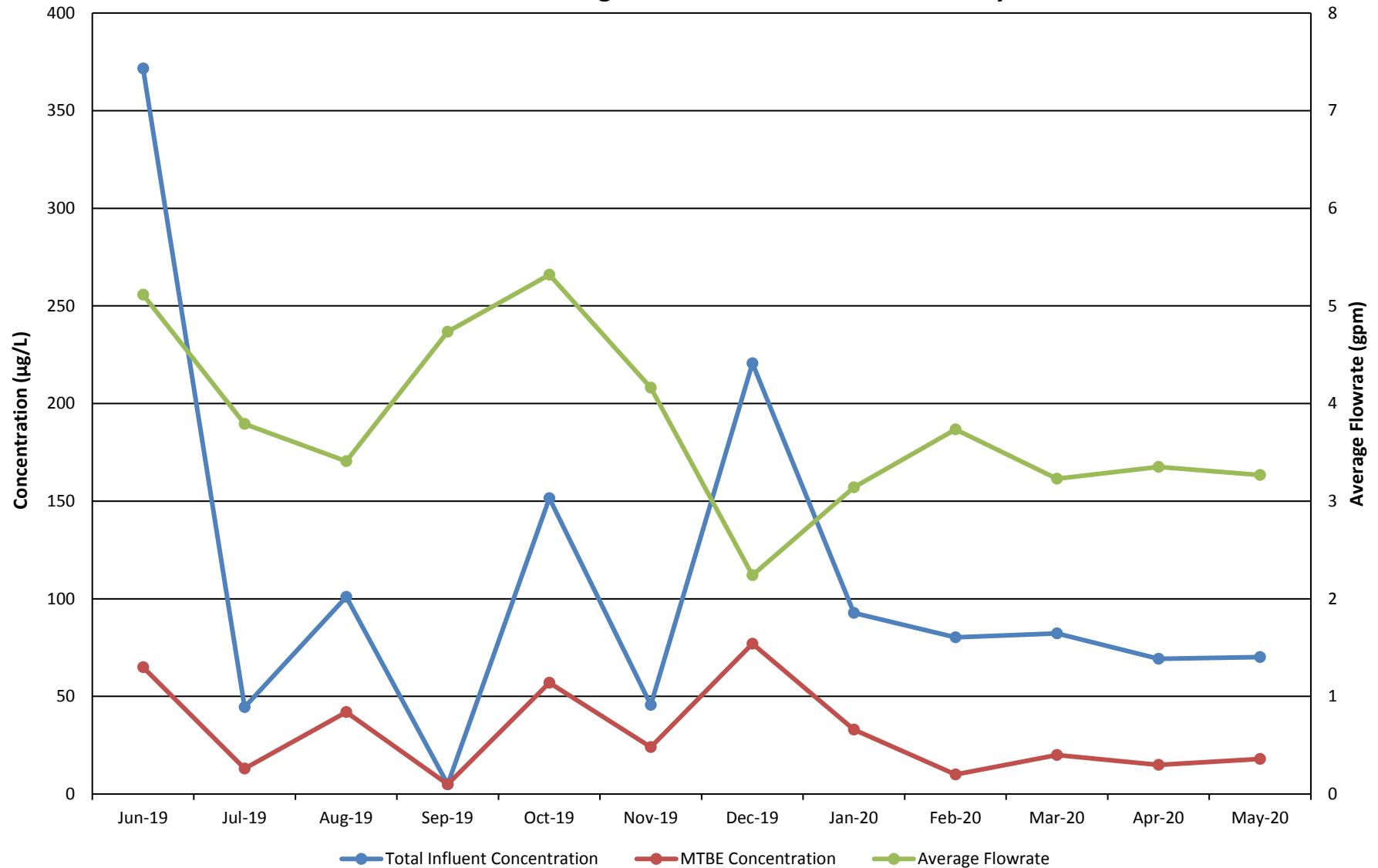
J = analyte concentration is considered an estimated value due to a detected concentration value between the reporting limit and method detection limit for the contaminant.

NA = not applicable

N/C = number of samples out of compliance with discharge limits.

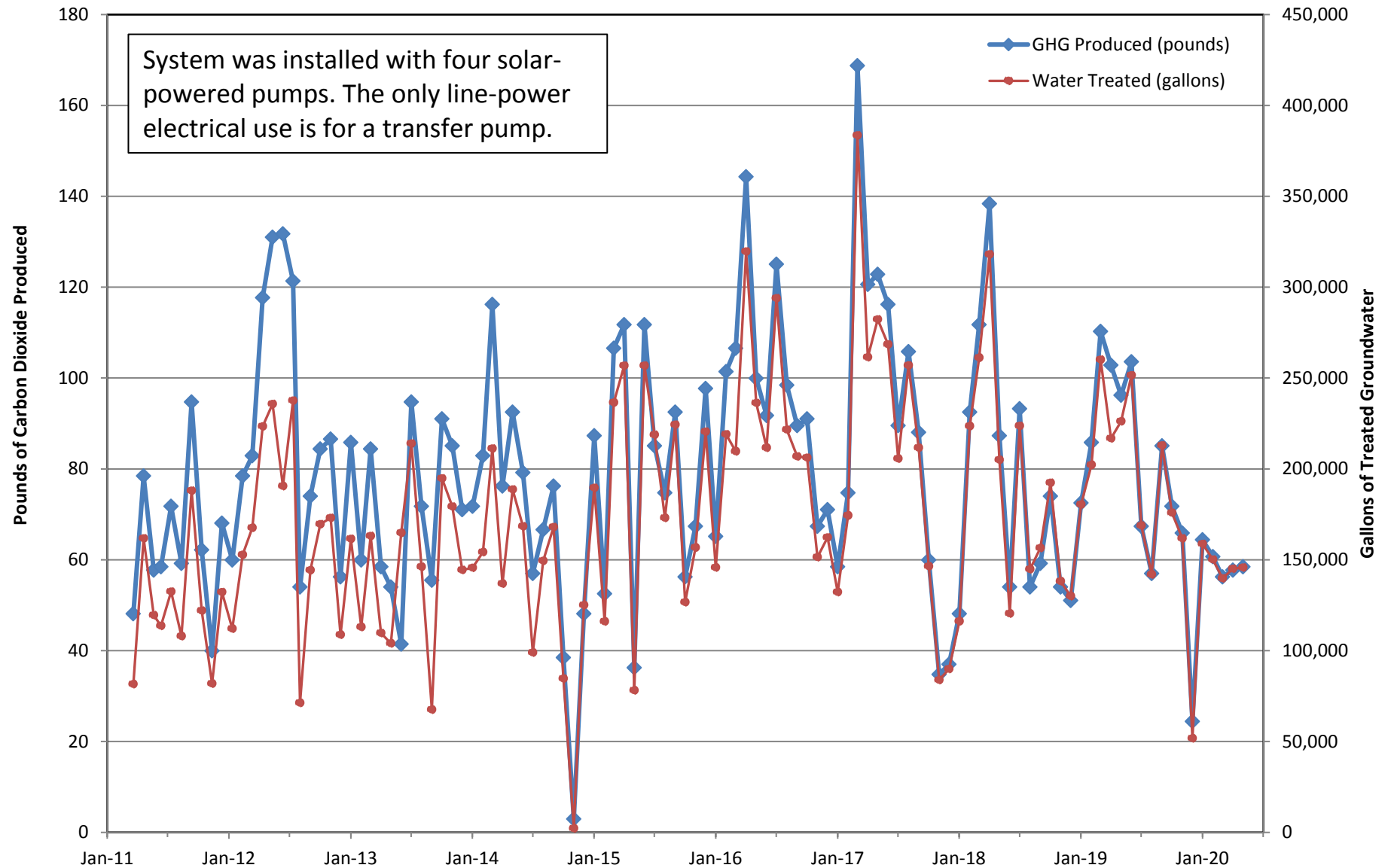
ND = not detected above method detection limit.

**Figure 1**  
**ST018GWTP Total VOC and MTBE Concentrations**  
**and Average Flowrate Twelve Month History**



## Figure 2

### Equivalent Pounds of Carbon Dioxide Produced by the Site ST018 Groundwater Treatment Plant



# Travis AFB Restoration Program

## Program Update

*RPM Meeting June 17, 2020*

# Completed Documents (1)

- Vapor Intrusion Assessment Update Technical Memorandum
- 2012 CAMU Annual Report
- Old Skeet Range Action Memorandum
- 3<sup>rd</sup> Five-Year Review
- 2012 Annual Groundwater Remediation Implementation Status Report (GRISR)
- Subarea LF007C and Site SS030 Remedial Process Optimization Work Plan
- Pre-Design Site Characterization of SS029 Report
- Old Skeet Range Removal Action Work Plan
- 2013 CAMU Inspection Annual Report
- Groundwater Record of Decision (ROD)
- CG508 POCO Work Plan
- 2013 Annual GRISR
- FT004 Technology Demonstration Work Plan
- Kinder Morgan LF044 Land Use Control Report
- SD031 Technology Demonstration Work Plan
- TA500 Data Gap Investigation Work Plan
- ST018 POCO Work Plan Addendum
- SD037 GW RD/RA Work Plan
- Travis AFB UFP-QAPP
- DP039 Lead Excavation Technical Memo

# Completed Documents (2)

- Proposed Plan for ROD Amendment to WABOU Soil ROD
- Proposed Plan for ROD Amendment to NEWIOU Soil, Sediment, & Surface Water ROD
- SD034 Data Gap Investigation Work Plan
- POCO Investigation Work Plan for Oil-Water Separators
- ST032 POCO Soil Excavation Work Plan
- SD036 GW RD/RA Work Plan
- SS016 GW RD/RA Work Plan
- SS015 GW RD/RA Work Plan
- FT005 Technology Demonstration Work Plan
- 2014 Annual CAMU Monitoring Report
- Old Skeet Range PAH Delineation Report
- ST028 POCO Work Plan
- SS014 POCO TD Work Plan
- CG508 Site Investigation/Site Closure Request Report
- 2014 Annual CAMU Monitoring Report
- DP039 GW RD/RA Work Plan
- SD031 TDCCR
- ST018 POCO CCR
- Site SS030 Groundwater RA CCR
- Sites SD036 and SD037 Groundwater RACCR
- Site SS016 Groundwater RACCR
- Site SS015 Groundwater RACCR
- 2014 Annual GRISR
- Site CG508 Well Decommissioning Work Plan



# Completed Documents (3)

- Data Gap Investigation TM for Soil Sites SD033, SD043, & SS046
- Site FT004 Technology Demonstration Construction Completion Report
- Site SD031 Soil Remedial Investigation Work Plan
- Corrective Action Plan for DERA-Funded Oil Water Separators
- Site ST032 POCO Completion Report
- Site ST028 POCO Completion Report
- 2015 Annual CAMU Monitoring Report
- Site SD031 Remedial Investigation Work Plan
- Site SD034 Technology Demonstration Work Plan
- Site SS016 Soil Data Gaps Investigation Work Plan
- Multi-Site Bioaugmentation Technology Demonstration Work Plan
- Sites ST028 and ST032 POCO Well Decommissioning Work Plan
- Site TS060 Action Memorandum
- 2015 Annual GRISR
- FT005 Technology Demonstration Construction Completion Report
- Site CG508 POCO Well Decommissioning and Site Closeout Technical Memorandum
- Site DP039 Remedial Action Construction Completion Report
- ST028 POCO Well Decommissioning/Site Closeout Technical Memorandum
- Site TS060 Removal Action Work Plan

# Completed Documents (4)

- Multisite Technology Demonstration Construction Completion Report
- SS014 POCO Technology Demonstration Construction Completion Report
- Site LF044 Investigation Work Plan
- Site FT004 POCO Soil Data Gap Investigation Work Plan
- SD034 Technology Demonstration Construction Completion Report
- POCO Evaluation/Closeout Report for DERA-funded oil/water separators OW051, OW053, and OW054
- ST032 POCO Well Decommissioning and Site Closeout Technical Memorandum
- 2016 Annual CAMU Monitoring Report
- Work Plan for Fourth Five-year Review
- 2016 Annual GRISR
- Data Gap Investigation Results, Technical Memorandum for Soil, Sites SD033, SD043, SS046
- TS060 Removal Action Completion Report
- SS035 Site Closure Report
- AOC TA500 Data Gaps Investigation and Closure Report
- Site TS060 No Further Action Proposed Plan
- POCO Evaluation/Closure Report for DERA-funded Oil/Water Separators OW040, OW047, OW048, OW049, OW050, OW052, OW055, OW056, and OW057

# Completed Documents (5)

- Data Gap Investigation Results, Technical Memorandum for Soil Site SS016
- LF006, SS030, SD031 Aquifer Test Activities Technical Memorandum
- SS015 Soil Sampling Plan
- Monitoring Well Installation Tech Memo for Site DP039, Addendum to the RACCR
- FT005 Extraction System Optimization Tech Memo
- 2017 Annual CAMU Monitoring Report
- LF044 Sediment Sampling Report
- SD043 RD/RA Work Plan
- SS046 RD/RA Work Plan
- Amendment to the WABOU Soil ROD for sites DP039, SD043, and SS046
- EVO Sites FT004, SS015, SD031, & SD036 Optimization Injections Tech Memo
- LF006 Technology Demonstration Work Plan
- AOC TA500 Well Decommissioning and Site Closeout Tech Memo
- SS015 Soil Sampling Results Tech Memo
- LF006 Technology Demonstration Construction Completion Report
- Subarea LF007C TPH Chromatogram Review TM
- 2017 Annual GRISR
- SS014 POCO Subsites 2, 4, and 5 Closure Evaluation Report
- Addendum to the Site SS016 Groundwater RD/RA Work Plan

# Completed Documents (6)

- SD043 Remedial Action Completion Report
- NFA ROD for Old Skeet Range (TS060/TS060A MRA)
- 2018 Annual GRISR
- SS046 Remedial Action Completion Report and Well Decommissioning Work Plan
- 2018 LF007 CAMU Inspection, Monitoring, and Maintenance Report
- Amendment to the NEWIOU Soil ROD for Sites SS016 and SD033
- SS016 RD/RA Work Plan
- 4<sup>th</sup> Five Year Review Report for Multiple Groundwater, Soil, and Sediment Sites
- SD043 Site Closure Report
- SS046 Well Decommissioning and Site Closeout Tech Memo
- LF008 Remedial Action Evaluation Report
- ***SD031B POCO Additional Site Investigation Work Plan***

# Completed Field Work (1)

- Replace battery banks at ST018 Groundwater Treatment Plant
- Annual Groundwater Remediation Implementation Program (GRIP) Sampling event
- Well Decommissioning (9 Wells)
- Electrical repairs to FT005 extraction system (well EW01x05)
- Electrical repairs to Site SS029 extraction system
- Site ST018 carbon vessels upgrade
- 2014 GRIP Semiannual Sampling Event
- Pump repairs to Site SS016 well (EW610x16)
- Subsite LF007C optimization upgrades
- 2014 Annual GRIP Sampling Event
- Biological Resource Assessment
- Site CG508 Site Investigation
- Old Skeet Range Characterization Sampling
- 4Q Semiannual GRIP Sampling Event
- SD031 Technology Demonstration Well Installation
- SD037 Well Installation
- SD031 Trench/Conveyance/Power Installation
- SD031 EVO Injection
- ST018 Well Installation
- SS015 Well Installation
- SS016 Well Installation
- Well Development (SD036, SD037)
- ST018 Trench/Conveyance/Power Installation
- SD036 EVO Injection
- Well Development (SS015, SS016)
- Baseline Sampling (SS015, SS016)
- SS014 Data Gap Investigation
- SS016 EVO Injection
- TA500 Data Gaps Investigation

# Completed Field Work (2)

- 2015 Annual GRIP Sampling
- SD037 EVO Injection
- SD034 Data Gaps Investigation
- SS015 EVO Injection
- FT005 Injection Well Installation
- OWS 47, 48, 49 Site Investigations
- SS030 Trench/Conveyance/Power Installation
- FT005 Trench Installation
- FT005 Well Development
- FT004 Well Installation, Well Development, Baseline Sampling
- FT005 Baseline Sampling
- DP039 Well Installation, Well Development, Baseline Sampling
- FT004 EVO Injection
- FT004 Trench/Conveyance/Power Installation
- DP039 Infiltration Trench Installation
- TA500 Groundwater Sampling
- FT005 EVO Injection
- 2016 Q2 GRIP Sampling
- Data Gap Inv. for Soil Sites (SD043, SS046)
- SD031 Remedial Investigation Step-out Sampling (2<sup>nd</sup> round)
- DP039 EVO Injection
- CG508 Well Decommissioning
- SD033 Soil Sampling
- Multi-site Bioaugmentation Well Installation
- SD034 Technology Demonstration Well Installation
- SS014 Bioreactor Installation
- ST028 & ST032 Well Decommissioning

# Completed Field Work (3)

- SS016 Soil Data Gaps Investigation
- SD031 Remedial Investigation Soil Sampling (3<sup>rd</sup> round)
- Oil Water Separators Step-out Drilling
- OW055 Close-in-place
- Q4 2016 GRIP Sampling
- OW040 Soil Excavation/Surface Restoration
- OW057 Soil Excavation/Surface Restoration
- Multi-site Bioaugmentation & EVO Injection
- SD034 Technology Demonstration Bioreactor Installation
- OW050 Soil Sampling at Former Location of OWS
- OW055 Sidewalk Repairs
- SD031 Finish Soil Delineation (NE portion of site)
- Q2 2017 GRIP Sampling Event
- SS015 Optimization: Injection Well Installation
- DP039 Down-gradient Monitoring Well Installation (1<sup>st</sup> round)
- SD036 Optimization: Injection Well Installation
- SD031 Optimization: Injection Well Installation
- OW056 Site Excavation/Closure
- Well Re-development
- TS060 Removal Action

# Completed Field Work (4)

- FT004 POCO Soil Data Gaps Investigation
- LF044 Sediment Sampling
- FT004 EVO Optimization
- DP039 Install downgradient monitoring wells (2<sup>nd</sup> round)
- FT005 – Install Extraction Wells
- DP039 Repair SBGR distribution headers
- Q4 2017 GRIP Sampling
- SD036 EVO Optimization
- SS015 EVO Optimization
- SD031 EVO Optimization
- FT005 Installation of Pumps and Controls in 5 New Extraction Wells
- Q1 2018 GRIP Sampling
- SD037 EVO reinjection
- Q2 2018 GRIP Sampling
- SS015 Soil sampling
- TA500 Well Decommissioning
- FT005 EVO injection
- FT004 POCO Soil Investigation
- 3Q 2018 GRIP Sampling
- LF006 Well Installations and Injections
- 4Q 2018 GRIP Sampling
- SD043 Soil excavation
- 1Q 2019 GRIP Sampling
- 2019 Annual LUC Inspections
- SS046 Soil excavation
- 2Q 2019 GRIP Sampling Event
- Well Re-development (11 wells)
- SD037 Injection Well Installation
- SS046 Well Decommissioning



# Completed Field Work (5)

- 3<sup>rd</sup> Quarter 2019 GRIP Sampling
- SD034 O<sub>2</sub> Enhancement
- SS016 SBGR Repairs
- SD037 EVO Re-injection
- 4<sup>th</sup> Quarter 2019 GRIP Sampling
- SD031B POCO Additional Investigation (Gore Sorber Round 1)
- SD043 Well and GETS Decommissioning
- SS016 Soil excavation
- SS015 SPOC system installation
- SD031B POCO Additional Investigation (Gore Sorber Round 2)
- Annual CAMU Gas Monitoring
- SS015 SPOC Sampling
- ***2Q20 GRIP Sampling***

# Documents In-Progress

## CERCLA

- Community Relations Plan Update (revised draft)
- SD031 Soil RI/FS
- Initial Passive Vent Systems Sampling Work Plan Tech Memo
- Optimization Activities Tech Memo for SD034 and SD037
- ***SD043 Well Decommissioning and Site Closeout Tech Memo***

## POCO

- FT004 POCO Corrective Action Plan

# Field Work In-Progress

## CERCLA

- DP039 Bioreactor Rejuvenation

## POCO

- SD031B Phase 2 Soil, Vapor, & Groundwater Sampling

# Documents Planned

## CERCLA

- |                               |      |
|-------------------------------|------|
| • 2019 GRISR                  | June |
| • SS016 Soil RACR             | Aug  |
| • 2019 CAMU Monitoring Report | TBD  |

## POCO

None

# Field Work Planned

## CERCLA

- DP039 Phytoremediation Trench extension July
- LF008 Well Decommissioning July
- Passive Vent Systems Sampling Aug

## POCO

- FT004 Soil Excavation Aug
- SD031B Phase 3 MW Installation & GW Sampling Aug

Note: Contact Lonnie Duke if you  
would like to observe planned field  
work events

# Petroleum Technology Demonstration Projects (1)

- SS014: Recycled Drywall Subgrade Biogeochemical Reactor (SBGR)
  - Evaluate the effectiveness of sulfate (gypsum from crushed drywall) to enhance anaerobic biodegradation of petroleum in groundwater
  - Installation was completed November 2016
  - Results through ~2.5 years
    - TPH-G: 99% reduction in source area (1,900 to <25 mg/L [non-detect])
    - TPH-D: 99% reduction in source area (5,500 to 76 mg/L)
    - Benzene: 99% reduction in source area (90 to <0.4 mg/L [non-detect])
    - Plume as a whole continues to shrink, so this TD has been quite successful

**No new data since the last update**

SBGR = Subgrade Biogeochemical Reactor

**Updates in Green Font**

# Petroleum Technology Demonstration Projects (2)

- SD034: Aerobic “Washboard” Subgrade Biogeochemical Reactor (SBGR)
  - Installed six (6) SBGR trenches in November 2016 to evaluate the effectiveness of an oxygen-enhanced aerobic SBGR on reducing TPH as diesel (TPH-D) in groundwater
  - Below SBGR trench (MW811x34/PZSSAx34)
    - TPH-D baseline of 9,600 ug/L decreased to 90 ug/L at 2.5 years in May 2019 and 77 ug/L by October 2019). Concentration fluctuations are to be expected as higher concentration areas are flushed as part of the washboard effect. Recently completed enhancements to the SBGR trenches to maintain treatment efficiency.)
    - TPH-MO baseline of 2,300 ug/L decreased to non-detect at 2 years and remained non-detect at through latest sampling event in October 2019
  - Plume hot spot monitoring well (MW02x34)
    - TPH-D baseline of 8,300 ug/L decreased to 5,500 ug/L at 2.5 years in May 2019, 430 ug/L in August 2019, and 4,300 ug/L in October 2019 (Concentration fluctuations are to be expected as higher concentration areas are flushed as part of the washboard effect. Recently completed enhancements to the extraction network to help reductions in this area.)
    - TPH-MO baseline of 1,500 ug/L decreased to 1,100 J ug/L at 2.5 years in May 2019, 210 J ug/L in August 2019, and 520 ug/L in October 2019
- Aerobic treatment process for this TD has been successful, but additional enhancements were recently completed to maintain treatment efficiency (replacement extraction well, new extraction well, and biosparging inside the SBGR trenches)

**No new data since the last update**

**Updates in Green Font**

# CVOC Technology Demonstration Projects (3)

- Multisite Bioaugmentation: EVO and KB-1 Plus (No new information)
  - Evaluate if addition of bioaugmentation substrate to an EVO injection will increase the rate of CVOC degradation
  - Initial injections were completed (Nov 2016)
  - Summary:
    - It is inconclusive if bioaugmentation provided a noticeable increase in degradation rates compared to EVO only for Site ST027B.
    - TCE fluctuations at SD036 bioaugmentation area and 99% decrease in the EVO-only area, reinjections and additional injection wells have supported significant reductions to the east of the site (in MW2064Ax36, TCE reduced from 6,400 to 11 ug/L), northeast (in MW2063x36, TCE reduced from 1,000 to 1.8 J ug/L), and to the north (in MW2187x36, TCE reduced from 1,400 to 84 ug/L). Inconclusive if bioaugmentation was beneficial, ultimately performance was dictated by the additional injection wells installed to treat upgradient source mass.
- FT005: Distribution of EVO and KB-1 Plus
  - Evaluate total organic carbon (TOC) dispersion distances and rates for optimizing the remediation of 1,2-dichloroethane (DCA) in groundwater. TD installation completed May 2016. Optimized the GETs in 2017
    - FT005 north area: Slightly elevated TOC and reduced COC concentrations (below MCLs);
    - FT005 central area: Limited TOC increase observed to date in most areas, as injected EVO may be adsorbed to sediments or being consumed faster than spread can be observed. However, MW2292x05 (south of Base boundary) had TOC increase from 1.2 to 20 mg/L between May and October 2018, likely the result of the newly installed extraction wells and the 2018 reinjection in this area.
    - FT005 south area: No TOC increase observed in this control area: Newly installed extraction wells are effectively capturing the remaining 1,2-DCA hot spots, with concentrations now beginning to decrease in these areas
    - New extraction wells are decreasing 1,2-DCA (e.g., 3.6 to 0.81 J; 1.4 to <0.4; 5.9 to 4.2; 3.0 to 1.8 ug/L)
    - Distribution of TOC through the aquifer via extraction was not able to be demonstrated via sampling data, although it is still expected to have had a benefit to remediation as a whole

No new data since the last update

Updates in Green Font



# CVOC Technology Demonstration Projects (4)

- **FT004: Distribution of EVO via SBGR and/or Groundwater Extraction**
  - Determine effectiveness of TOC distribution through two different enhanced reductive dechlorination (ERD) approaches: (1) groundwater TOC recirculation using a combination EVO injection, infiltration SBGR trenches, and groundwater extraction; and (2) EVO injection with groundwater extraction
  - Installation completed April 2016
  - Max monitoring well TCE concentration of 560 µg/L (baseline) was reduced to 63 ug/L in October 2018 and 94 ug/L in October 2019
  - Limited TOC dispersal, additional EVO injection conducted with nanoEVO in 2017 to determine if this can enhance TOC dispersal
    - Variable TOC increase and TCE decrease in main plume area monitoring wells
    - In some extraction wells, TCE concentrations are increasing. This indicates additional TCE mass below the vernal pools that is now being pulled to the extraction wells (recirculation is working, but we are fighting additional TCE mass present below the vernal pools, so it will take additional time to see concentration reductions)
    - MW2330x04 maxed out at 640 ug/L in April 2018, decreased to 49 ug/L in May 2019, and rebounded to 600 ug/L in October 2019. Need to further evaluate what is causing these fluctuations

**No new data since the last update**

**Updates in Green Font**

# CVOC Technology Demonstration Projects (5)

- SD031: EVO distribution via Gravel Chimneys (No new information)
  - Determine if EVO injection and recirculation of groundwater through gravel chimneys can effectively distribute TOC horizontally in the subsurface to support ERD of 1,1-dichloroethene (DCE). Installation completed in April 2015
  - Summary:
    - TD has been successful relative to our design assumptions, TOC increased to >10 mg/L within majority of target area and COCs decreased to below MCLs (most wells ND, max 1,1-DCE reduced from 390 ug/L to ND)
    - 1,1-DCE (primary COC) concentrations have reduced by 99% (sum of key wells within TD area, excluding 2 wells to SW that increased expected to be caused by previously unknown downgradient mass)
    - Total molar concentration (sum of CVOCs) has reduced by 99% (sum of key wells within TD area, excluding 2 wells to SW that increased)
    - Four (4) new EVO wells installed to SW to enhance TOC in problem areas (plume being pulled back towards extraction well causing increasing concentrations in this cross-gradient area), conducted reinjection of EVO in 2017
      - 1,1-DCE in SW area where we reinjected: MW568x31 decreased from max of 48 ug/L to ND, MW572x31 decreased from max of 200 to 13 ug/L, and MW574x31 decreased from max of 33 to 8.9 ug/L

No new data since the last update

Updates in Green Font

# Completed Documents (Historical 1)

- Basewide Health & Safety Plan (HSP)
- Action Plan
- 2007/2008 GSAP Annual Report
- LF007C RPO Work Plan
- LF008 Rebound Study Work Plan
- SS014 Tier 1 POCO Evaluation Work Plan
- ST027B Site Characterization Work Plan
- SS030 RPO Work Plan
- ST032 POCO Technical Memo
- DP039 Bioreactor Work Plan
- 2008 Annual GWTP RPO Report
- Passive Diffusion Bag (PDB) Technical Memo
- RD/RA QAPP Update
- ST032 Tier 1 POCO Evaluation Work Plan
- Phytostabilization Demonstration Technical Memo
- Model QAPP
- LF008 Rebound Test Technical Memo
- Comprehensive Site Evaluation Phase II Work Plan
- Field Sampling Plan (FSP)
- SS016 RPO Work Plan
- ST018 POCO RA Work Plan
- Vapor Intrusion Assessment Report
- GSAP 2008/2009 Annual Report
- FT005 Data Gap Work Plan
- First, Second, & Third Site DP039 Sustainable Bioreactor Demonstration Progress Reports
- DP039 RPO Work Plan
- SD036/SD037 RPO Work Plan
- ST027B Site Characterization Report
- 2009 GWTP RPO Annual Report
- Natural Attenuation Assessment Report (NAAR)
- Union Creek Sites SD001 & SD033 Remedial Action Report
- CAMU 2008-2009 Monitoring Annual Report

# Completed Documents (Historical 2)

- Phytostabilization Study Report
- 2009/2010 Annual GSAP Report
- SS015 Remedy Optimization Field Implementation Plan
- Sites SS014 and ST032 Tier 1 POCO Evaluation Report
- SD036 Remedy Optimization Field Implementation Plan
- 2010 Annual CAMU Inspection Report
- Site ST018 POCO Baseline Implementation Report
- FT005 Data Gaps Investigation Report
- Comprehensive Site Evaluation Phase II Report
- 2010 Groundwater RPO Annual Report
- Focused Feasibility Study (FFS)
- Site ST027-Area B Human Health Risk Assessment
- Site ST027-Area B Ecological Risk Assessment
- Work Plan for Assessment of Aerobic Chlorinated Cometabolism Enzymes
- 2010/2011 Annual GSAP Report
- Baseline Implementation Report (Sites SS015, SS016, SD036, SD037, and DP039)
- 2011 CAMU Annual Report
- Technical and Economic Feasibility Analysis (TEFA)
- Work Plan for RPO of Sites SS016 and SS029
- Site LF007C Data Gaps Investigation Technical Memorandum
- Technical Memorandum for Assessment of Aerobic Chlorinated Cometabolism Enzymes
- Old Skeet Range Engineering Evaluation/Cost Analysis
- 2011 Groundwater Treatment RPO Annual Report
- Groundwater Proposed Plan (PP)
- FT005 Remedial Action Completion Report
- 2012 GSAP Technical Memorandum<sup>23</sup>

# Completed Field Work (Historical 1)

- ST027B Gore Sorber Survey–Phase 1
- ST027B Field Sampling – Phase 2
- GSAP 2008 Semi-annual Event
- ST027B Installation of Wells – Phase 3
- SS014 Site Characterization
- LF008 Rebound Study
- GSAP Annual Sampling Event - 2009
- SS030 Site Characterization–Phase 1
- ST027 Site Characterization -Phase 3
- ST014 Monitor Well Install - Subsite 3
- SD001/SD033 Sediment RA
- SS016 Site Characterization (OSA source area)
- ST018 Site Characterization
- SS030 Site Characterization (Off-base VOC Plume)
- DP039 Site Characterization (for Biobarrier Placement)
- SS014 & ST032 Q1 2010 MNA Sampling (2<sup>nd</sup> of 4 quarterly events)
- SD036 Additional Site Characterization (north & east)
- Therm/Ox System Removal
- SS016 Monitoring Well Installation
- SD037 EVO Injection Well Installation
- DP039 Monitoring Well & Injection Well Installation
- DP039 EVO Injection
- SD037 Monitoring Well Installation
- GSAP 2010 Annual Sampling Event
- SD037 EVO Injection
- SS015 Site Characterization
- South Plant GAC Change-out
- FT005 Data Gap Investigation
- SS016 Position Survey of EW03
- SS016 Bioreactor Installation
- SS016 Bioreactor Baseline Sampling
- DP039 Biobarrier Quarterly Performance Sampling

# Completed Field Work (Historical 2)

- DP039 Bioreactor Quarterly Performance Sampling
- SD037 EVO Quarterly Performance Sampling
- SS015 EVO Baseline Sampling
- SD036 EVO Baseline Sampling
- SS016 Bioreactor Startup
- SD036 Injection Wells Installation
- SS015 Injection Wells Installation
- ST018 GETS Installation
- SD036 EVO Injection
- 2010 Semiannual GSAP
- SS015 EVO Injection
- Quarterly RPO Performance Monitoring (Feb 2011)
- ST018 GETS Startup
- Quarterly RPO Performance Monitoring (May 2011)
- 2011 Annual GSAP Sampling
- SS029 GET Shutdown Test (System Optimization analysis)
- Quarterly RPO Performance Monitoring (Aug 2011)
- Quarterly RPO Performance Monitoring (Nov 2011)
- 2011 Semiannual GSAP Sampling
- LF007C Site Characterization (Wetlands)
- FT005 Soil Remedial Action
- Performance Monitoring SS015 (4<sup>th</sup> Quarterly event)
- Sampling for Assessment of Aerobic Chlorinated Cometabolism Enzymes (Feb 21-22)
- 2012 Annual GSAP Sampling
- CAMU Lysimeter Removal
- LF007C GET System Optimization
- SS029/SS016 System Optimization Analysis
- GSAP Semiannual Sampling Event
- Replace electrical wiring for well field at Site SS030