

**Travis Air Force Base
Environmental Restoration Program
Restoration Program Manager's
Meeting Minutes
21 February 2018, 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) meeting on 21 February at 0930 hours in Building 248 at Travis AFB, California. Attendees included:

Lonnie Duke	AFCEC/CZOW
Glenn Anderson	AFCEC/CZOW
Milton 'Gene' Clare	AFCEC/CZOW
Angel Santiago Jr.	AFCEC/CZOW
Haekyung Kim (via telephone)	AFCEC/CZRW
Kurt Grunawalt	Travis AFB/JA
Merrie Schilter-Lowe	Travis AFB/PAO
Adriana Constantinescu	RWQCB
Ben Fries	DTSC
Monika O'Sullivan	AFCEC/CZOW
Nadia Hollan Burke	USEPA
Indira Balkissoon	Techlaw, Inc
Paul Townley	CH2M
Jeff Gamlin	CH2M
Mike Wray	CH2M

Handouts distributed prior to or at the meeting, discussions, and presentations included:

Attachment 1	Meeting Agenda
Attachment 2	Master Meeting and Document Schedule
Attachment 3	SBBGWTP Monthly Data Sheet (January 2018)
Attachment 4	CGWTP Monthly Data Sheet (January 2018)
Attachment 5	LF007C GWTP Monthly Data Sheet (January 2018)
Attachment 6	ST018 Monthly Data Sheet (January 2018)
Attachment 7	TPH Detections at Subarea LF007C (February 2018)

1. ADMINISTRATIVE

A. Previous Meeting Minutes

The 17 January 2018 RPM meeting minutes were approved and finalized as written.

B. Action Item Review

Action items from November 2017 were reviewed.

Action item 1 is ongoing: Ms. O'Sullivan to provide updates on perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA). 21 February 2018 update: The Draft SI Report is expected to be complete by the end of the week, and will require a few weeks for internal Air Force review. Findings will be ready by, and presented at, the April 2018 RAB meeting.

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

The next RPM meeting will be a teleconference to be held on Wednesday 21 March 2018, at 0930 hours.

The annual RAB tour (which historically has been held in October) has been rescheduled to occur sometime in the summer when field work is being conducted. The tour will be coordinated to align with field work of interest to the RAB. As a result, all agencies agreed to move the October RPM meeting from Thursday, October 18, to Wednesday, October 17, at 0930.

Travis AFB Master Document Schedule

- Community Relations Plan Update (CRP): No change was made to the schedule. A draft final version will be submitted next; the schedule will be developed as higher priority documents are submitted. A schedule update is expected at the next RPM meeting. Ms.

Burke noted her concern that many documents for public review are being submitted ahead of the plan for public involvement (i.e., the CRP); Glenn noted that the website updates will notify and provide guidance for public review of these documents. EPA requested the Response to Comments for the CRP, and the Air Force stated they could provide those in the meantime while the website and CRP are being updated.

- Amendment to the WABOU Soil ROD for Travis AFB ERP Sites DP039, SD043, and SS046: The RTC due date was changed to 11 April 2018 to allow time to prepare RTCs to additional comments from EPA Headquarters; the remainder of the schedule was changed accordingly. Mr. Wray reminded the team that the timing on this document is crucial to support completion of field work in 2018; Ms. Burke recommended resolving Headquarters' comments before others, because they may take longer for approval.
- Amendment to the NEWIOU Soil ROD for the Travis AFB ERP Sites SS016 and SD033: The submittal date of the pre-draft version was changed to 28 February 2018 due to prioritization of other documents. The remainder of the schedule was changed accordingly. Mr. Wray noted that timing on this document is also crucial to support completion of field work in 2018.
- Site SD031 Soil Remedial Investigation/Feasibility Study: The submittal date of the pre-draft version was changed to 13 March 2018 due to prioritization of other documents.
- Site SD043 Remedial Design/Remedial Action Work Plan: This is a new document; the intent is to expedite the field work upon finalization of the WABOU ROD-A.
- Site SS046 Remedial Design/Remedial Action Work Plan: This is a new document; the intent is to expedite the field work upon finalization of the WABOU ROD-A.
- Site SS016 Remedial Design/Remedial Action Work Plan: This is a new document; the intent is to expedite the field work upon finalization of the NEWIOU ROD-A.
- Potrero Hills Annex (FS, PP, and ROD): No change was made to the schedule. Mr. Anderson said the contractor submitted the 2017 data gap report of findings. The next step is completion of the Feasibility Study.
- Data Gap Investigation Results Technical Memorandum for Soil Sites SD033, SD043, and SS046: No change was made to the schedule.
- Data Gap Investigation Results Technical Memorandum for Soil Site SS016: Response to comments due date changed to 21 March 2018; Mr. Anderson noted that he has responses to agency comments prepared.
- Site SS015 Soil Sampling Plan: This is a new document.
- Quarterly Newsletters (April 2018): The pre-draft version was submitted on 31 January 2018. This newsletter included the Site TS060 Proposed Plan. Ms. Burke informed the team that EPA may have to track this under a different type of document, such as a no further action "Action Memorandum", because the EPA can't add another PP/ROD if the site is not considered to be a part of an existing Operable Unit.
- 2017 Annual GRISR: This is a new document.

- Site TS060 Removal Action Completion Report: The response to comment due date and final due date was changed to 5 March 2018. EPA has approved the Air Force responses; DTSC also approved with no comment.
- Site SS035 Site Closure Report: No change was made to the schedule. The RTC meeting will be held following today's RPM meeting.
- Monitoring Well Installation Technical Memorandum for Site DP039, Addendum to the Site DP039 Remedial Action Construction Completion Report: This is a new title for the former Site DP039 Monitoring Well Installation Report. Applicable data will be repeated in the GRISR. The pre-draft date has been changed to 26 February 2018; the rest of the schedule was changed accordingly.
- Sites LF006, SS030, and SD031 Aquifer Test Activities Technical Memorandum: The pre-draft date has been changed to 15 February 2018 to reflect actual submittal date; the rest of the schedule was changed accordingly.
- Site FT005 Extraction System Optimization Report: The pre-draft version submittal date has been changed to 8 March 2018; the rest of the schedule was updated accordingly.
- 2017 Annual CAMU Monitoring Report: This is a new document.
- Emulsified Vegetable Oil Sites FT004, SS015, SD031, and SD036 Optimization Injections Report. The pre-draft submittal date has been changed to 22 May 2018; the rest of the schedule has been updated accordingly. This will document the field work; any conclusions drawn will also be included in the GRISR.
- Site LF044 Sediment Sampling Report. This is a new document.
- POCO Evaluation/Closure Report for DERA-funded Oil/Water Separators OW040, OW047, OW048, OW049, OW052, OW050, OW052, OW055, OW056, and OW057. There was no change to the schedule. The Water Board indicated that they are still reviewing, and will provide comments to the Air Force by the end of the week. Ms. Constantinescu noted that they will be providing an NFA letter for each OWS on an individual basis, not all at the same time. She also noted that she would like to ensure that each closure report includes language regarding safety of future workers at these sites.
- Area of Concern TA500 Data Gap Investigation and Closure Report: No change was made to the schedule. Ms. Constantinescu requested an extension to the Water Board's review time to 16 March 2018.
- The following documents were moved to History:
 - 2016 Annual GRISR

2. CURRENT PROJECTS

Treatment Plant Operation and Maintenance Update

South Base Boundary Groundwater Treatment Plant, January 2018 (see Attachment 3)

The South Base Boundary Groundwater Treatment Plant (SBBGWTP) performed at 93% uptime, and 6.0 million gallons of groundwater were extracted and treated in January 2018. All treated water was discharged to Union Creek. The average flow rate for the SBBGWTP was 154.6 gallons per minute (gpm). Electrical power usage was 16,556 kWh, and approximately 13,051 pounds of CO₂ were created (based on DOE calculation). Approximately 1.35 pounds of volatile organic compounds (VOCs) were removed in January. The total mass of VOCs removed since startup of the system is 497.3 pounds. No optimization activities are reported for the month of January 2018.

The GAC vessels were cleaned and the filters were changed. Extraction wells EW01x29 and EW02x29 were turned off due to persistent fouling; the submersible pumps may need to be pulled and replaced.

Central Groundwater Treatment Plant, January 2018 (see Attachment 4)

The Central Groundwater Treatment Plant (CGWTP) performed at 100% uptime with approximately 1,192,459 gallons of groundwater extracted and treated in January 2018. All treated water was discharged to the storm sewer system which discharges to Union Creek. The average flow rate for the CGWTP was 30.7 gpm. Electrical power usage was 2,238 kWh for all equipment connected to the Central Plant, and approximately 2,544 pounds of CO₂ were generated. Approximately 2.21 pounds of VOCs were removed from groundwater by the treatment plant in January. The total mass of VOCs removed since the startup of the system is 11,482 pounds.

Optimization Activities for CGWTP: After operating in a four-week “pulsed mode” the DP039 Bioreactor was taken off line on 22 January 2018. No other optimization activities are reported for the month of January 2018.

LF007C Groundwater Treatment Plant, January 2018 (see Attachment 5)

The Subarea LF007C Groundwater Treatment Plant (LF007C GWTP) performed at 91% uptime with approximately 118,030 gallons of groundwater extracted and treated in January 2018. All treated water was discharged to the Duck Pond for beneficial reuse. The average flow rate was 3.2 gpm. Approximately 1.53×10^{-3} pounds of VOCs was removed from groundwater by the treatment plant in January. The total mass of VOCs removed since the startup of the system is 174.38 pounds. There was no electrical power usage statistics as this plant operates on solar power only.

Optimization Activities for LF007C GWTP: No optimization activities are reported for the month of January 2018. There will be a presentation during this meeting documenting the TPH findings for effluent at this GWTP.

Note: The sump in the LF007C treatment compound is open to the atmosphere. Accumulated rain water must be pumped out by hand. This is done as part of the post-rain event inspections. This pad flooded from 15 January through 18 January. An automatic pump has been installed to minimize down-time in the future.

ST018 Groundwater (MTBE) Treatment Plant, January 2018 (see Attachment 6)

Site ST018 (MTBE) Treatment Plant (ST018 GWTP) performed at 100% uptime with approximately 116,140 gallons of groundwater extracted and treated in January 2018. All treated water was discharged to the Fairfield – Suisun Sewer District. The average flow rate for the ST018 GWTP was 2.6 gpm. Electrical power usage for the month was 65 kWh for all equipment connected to the ST018 GWTP. The total CO₂ equivalent, including an estimate for the carbon change-out, equates to approximately 48 pounds. Approximately 0.06 pounds of BTEX, VOCs, and TPH was removed in January by the treatment plant, and approximately 0.01 pounds of MTBE was removed from groundwater. The total BTEX, MTBE and TPH mass removed since the startup of the system is 42.9 pounds, and the total MTBE mass removed since startup of the system is 10.6 pounds.

Note: Electrical power use at the ST018 GWTP is only for the alarm system and a pump that pushes water through the GAC vessels for treatment. The four groundwater extraction pumps in the system are all solar powered.

Optimization Activities for ST018 GWTP: Three of the four extraction wells (EW2014x18, EW2016x18, and EW2333x18) continued operating in a two-week “pulse-mode” (two weeks off, two weeks on, two weeks off, and so forth). Based on sampling results, the pulsed mode operation does not appear to be effective for increased MTBE capture; therefore, on 1 February 2018, all extraction wells were restarted and pulsed mode operation was terminated.

3. Presentations:

A) TPH Detections at Subarea LF007C (Attachment 7)

Mr. Jeff Gamlin provided an update on the TPH detections at Subarea LF007C. Please refer to Attachment 7 for details. Highlights of the presentation include:

- TPH has been detected in the groundwater treatment plant effluent numerous times.

- In order to get an idea of potential sources, two extraction wells and one monitoring well were sampled, in addition to the influent and effluent at the GWTP.
- The two extraction wells feed into the LF007C GWTP. The monitoring well was a background location that is situated cross gradient from the extraction wells.
- The wells were sampled on two dates; TPH-D and TPH-MO were analyzed, with and without silica gel cleanup, and the samples were also analyzed for SVOCs, and VOCs.
- In general, results were inconclusive and inconsistent, with no clear pattern of increasing or decreasing TPH concentrations with silica gel cleanup.
- Mr. Gamlin also checked the chromatograms for TPH. He noted that TPH-D has a characteristic curve that differs from the typical curve. There are a lot of natural organics at this site (vernal pools, cattle) that could be a source of the hydrocarbons observed in the samples.
- TPH-D and TPH-MO are not COCs for this site.
- The curves on the chromatograms did not fit a typical diesel or motor oil curve; they are skewed, but they also don't fully fit a sewage source. They are somewhere in between and also inconclusive.
- Given the inconclusive analytical results, together with the chromatogram information, risk must be determined using individual risk driving components such as BTEX, and naphthalene.
- The Air Force will continue to sample and analyze for TPH-D/MO, and will add SVOCs to the analyses, investigate split sampling with another lab, pull together the chromatograms, and investigate historical data from the site to determine the source. Results will be in a forthcoming technical memorandum.

C) Program Update: Activities Completed, In Progress, and Upcoming (see Attachment 8)

Mr. Wray reported on the status of fieldwork and documents which are completed, in progress, and upcoming. Please refer to Attachment 8 for the full briefing.

4. New Action Item Review

Ms. Constantinescu will obtain the citation for the Water Board health and safety code, to ensure that the language regarding health and safety requirements in the oil/water separator site management plans is consistent with the language in the LUCIP.

5. PROGRAM/ISSUES/UPDATE

Ms. Burke informed the team that, according to the 2016 EPA Community Involvement Handbook, a transcript of the TS060 Public Meeting will be required. Use of

a court reporter/stenographer is suggested, but not required. She noted the high quality of CH2M RPM meeting summaries, and is comfortable with CH2M staff following the same process (recording the audio and using that to provide a meeting summary) rather than a court reporter, for the TS060 public meeting summary.

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.	Adriana Constantinescu	Ms. Constantinescu to obtain the citation for the Water Board health and safety code, to ensure that the language regarding health and safety requirements in the oil/water separator site management plans is consistent with the language in the LUCIP.	March 21, 2018	Open

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

The RPM face-to-face meeting is scheduled for 09:30 AM PST on 21 February, 2018.
The call-in number is 1-866-203-7023. Enter the Participation code 5978-75-9736 then enter #.

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

- B TRIAD DISCUSSION:
TPH SAMPLING AT LF007C
- A PROGRAM UPDATE:
DOCUMENTS & ACTIVITIES COMPLETED, IN PROGRESS AND PLANNED

4. NEW ACTION ITEM REVIEW

5. PROGRAM/ISSUES/UPDATE

MEETING SCHEDULE

NOTES: AFTER THE RPM MEETING, BASED ON THE DISCUSSION DURING THE REVIEW OF THE MASTER MEETING AND DOCUMENT SCHEDULE, WE 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.

(2018)
Annual Meeting and Teleconference Schedule

Monthly RPM Meeting ¹ (Begins at time noted)	RPM Teleconference (Begins at time noted)	Restoration Advisory Board Meeting (Begins at 7:00 p.m.) (Poster Session at 6:30 p.m.)
—	01-17-18	—
02-21-18	—	—
—	03-21-18	—
04-19-18 (Thursday 2:00 PM)	—	04-19-18
—	05-16-18	—
06-20-18	—	—
—	07-18-18	—
08-15-18	—	—
—	09-19-18	—
10-18-18	—	May through October ²
—	11-21-18	—
—	—	—

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

² 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	Amendment to the WABOU Soil ROD for the Travis AFB ERP Sites DP039, SD043, and SS046 Travis AFB, Glenn Anderson CH2M, Latonya Coleman	Amendment to the NEWIOU Soil ROD for the Travis AFB ERP Sites SS016 and SD033 Travis AFB, Glenn Anderson CH2M, Latonya Coleman	Site SD031 Soil Remedial Investigation/Feasibility Study Travis AFB, Glenn Anderson CH2M, Nikki Carlton
Scoping Meeting	NA	NA	NA	NA
Predraft to AF/Service Center	08-23-16	10-09-17	02-28-18	03-13-18
AF/Service Center Comments Due	09-07-16	11-08-17	03-30-18	04-12-18
Draft to Agencies	09-28-16	11-30-17	04-16-18	04-27-18
Draft to RAB	09-28-16	11-30-17	04-16-18	04-27-18
Agency Comments Due	10-28-16 (11-28-16)	01-31-18	06-15-18	06-27-18
Response to Comments Meeting	TBD	02-21-18	06-20-18	07-18-18
Agency Concurrence with Remedy	NA	NA	NA	NA
Public Comment Period	NA	NA	NA	NA
Public Meeting	NA	NA	NA	NA
Response to Comments Due	TBD	04-11-18	07-12-18	08-03-18
Draft Final Due	TBD	04-11-18	07-12-18	08-03-18
Final Due	TBD	05-11-18	08-13-18	09-07-18

Travis AFB Master Meeting and Document Schedule

PRIMARY DOCUMENTS			
Life Cycle	Site SD043 Remedial Design/Remedial Action Work Plan Travis AFB, Glenn Anderson CH2M, Levi Pratt	Site SS046 Remedial Design/Remedial Action Work Plan Travis AFB, Glenn Anderson CH2M, Doug Berwick CAPE, Meg Greenwald	Site SS016 Remedial Design/Remedial Action Work Plan Travis AFB, Glenn Anderson CH2M, Doug Berwick CAPE, Meg Greenwald
Scoping Meeting	NA	NA	NA
Predraft to AF/Service Center	02-22-18	03-02-18	TBD
AF/Service Center Comments Due	03-08-18	03-16-18	TBD
Draft to Agencies	03-26-18	04-02-18	TBD
Draft to RAB	03-26-18	04-02-18	TBD
Agency Comments Due	04-25-18	05-02-18	TBD
Response to Comments Meeting	05-16-18	05-16-18	TBD
Agency Concurrence with Remedy	NA	NA	NA
Public Comment Period	NA	NA	NA
Public Meeting	NA	NA	NA
Response to Comments Due	05-31-18	06-01-18	TBD
Draft Final Due	05-31-18	06-01-18	TBD
Final Due	07-02-18	07-03-18	TBD

Travis AFB Master Meeting and Document Schedule

PRIMARY DOCUMENTS			
Life Cycle	Potrero Hills Annex Travis, Glenn Anderson		
	FS	Proposed Plan	ROD
Scoping Meeting	180 days after Water Board Order Rescinded	+470 days	+735 days
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
Response to Comments Meeting	+ 405 days	+665 days	+ 1110 days
Agency Concurrence with Remedy	NA	NA	+ 1130 days
Public Comment Period	NA	+735 to 765 days	NA
Public Meeting	NA	+745 days	NA
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	Data Gap Investigation Results Technical Memorandum for Soil Sites SD033, SD043, and SS046 Travis AFB, Glenn Anderson CH2M, Leslie Royer	Data Gap Investigation Results Technical Memorandum for Soil Site SS016 Travis AFB, Glenn Anderson CH2M, Doug Berwick CAPE, Meg Greenwald	Site SS015 Soil Sampling Plan Travis AFB, Glenn Anderson CH2M, Levi Pratt
Scoping Meeting	NA	NA	NA
Predraft to AF/Service Center	07-26-17	10-04-17	03-16-18
AF/Service Center Comments Due	08-09-17	10-18-17	03-30-18
Draft to Agencies	09-19-17	11-30-17	04-18-18
Draft to RAB	09-19-17	11-30-17	04-18-18
Agency Comments Due	10-19-17 (11-20-17)	01-02-18	05-18-18
Response to Comments Meeting	(11-15-17) 01-17-18	01-17-18	06-06-18
Response to Comments Due	(12-05-17) 02-01-18	03-21-18	06-20-18
Draft Final Due	NA	NA	NA
Final Due	(12-05-17) 02-01-18	03-21-18	06-20-18
Public Comment Period	NA	NA	NA
Public Meeting	NA	NA	NA

Travis AFB Master Meeting and Document Schedule

INFORMATIONAL DOCUMENTS			
Life Cycle	Quarterly Newsletter (Site TS060 Proposed Plan) (April 2018) Travis, Glenn Anderson	2017 Annual GRISR Travis AFB, Glenn Anderson CH2M, Leslie Royer	Site TS060 Removal Action Completion Report Travis AFB, Glenn Anderson CH2M, Doug Berwick CAPE, Meg Greenwald
Scoping Meeting	NA	NA	NA
Predraft to AF/Service Center	01-31-18	04-23-18	11-08-17
AF/Service Center Comments Due	NA	05-23-18	11-22-17
Draft to Agencies	02-28-18	06-15-18	12-11-17
Draft to RAB	NA	06-15-18	12-11-17
Agency Comments Due	03-28-18	07-16-18	01-15-18
Response to Comments Meeting	04-03-18	08-15-18	01-17-18
Response to Comments Due	04-04-18	08-29-18	03-05-18
Draft Final Due	NA	NA	NA
Final Due	04-04-18	08-29-18	03-05-18
Public Comment Period	NA	NA	NA
Public Meeting	NA	NA	NA

Travis AFB Master Meeting and Document Schedule

INFORMATIONAL DOCUMENTS			
Life Cycle	Site SS035 Site Closure Report Travis AFB, Glenn Anderson CH2M, Leslie Royer	Monitoring Well Installation Technical Memorandum for Site DP039, Addendum to the Site DP039 Remedial Action Construction Completion Report Travis AFB, Glenn Anderson CH2M, Levi Pratt	Sites LF006, SS030 and SD031 Aquifer Test Activities Technical Memorandum Travis AFB, Glenn Anderson CH2M, Renee Caird
Scoping Meeting	NA	NA	NA
Predraft to AF/Service Center	11-07-17	02-26-18	02-15-18
AF/Service Center Comments Due	11-21-17	03-14-18	03-02-18
Draft to Agencies	12-21-17	03-29-18	03-21-18
Draft to RAB	12-21-17	03-29-18	03-21-18
Agency Comments Due	01-25-18	04-30-18	04-20-18
Response to Comments Meeting	02-21-18	05-16-18	05-16-18
Response to Comments Due	03-14-18	06-08-18	06-04-18
Draft Final Due	NA	NA	NA
Final Due	03-14-18	06-08-18	06-04-18
Public Comment Period	NA	NA	NA
Public Meeting	NA	NA	NA

Travis AFB Master Meeting and Document Schedule

INFORMATIONAL DOCUMENTS				
Life Cycle	Site FT005 Extraction System Optimization Technical Memorandum Travis AFB, Glenn Anderson CH2M, Levi Pratt	2017 Annual CAMU Monitoring Report Travis AFB, Glenn Anderson CH2M HILL, Levi Pratt	Emulsified Vegetable Oil Sites FT004, SS015, SD031, and SD036 Optimization Injections Technical Memorandum Travis AFB, Glenn Anderson CH2M, Levi Pratt	Site LF044 Sediment Sampling Report Travis AFB, Glenn Anderson CH2M, Doug Berwick CAPE, Meg Greenwald
Scoping Meeting	NA	NA	NA	NA
Predraft to AF/Service Center	03-08-18	04-19-18	05-22-18	TBD
AF/Service Center Comments Due	03-22-18	05-03-18	06-06-18	TBD
Draft to Agencies	04-06-18	05-18-18	06-25-18	TBD
Draft to RAB	04-06-18	05-18-18	06-25-18	TBD
Agency Comments Due	05-07-18	06-18-18	07-26-18	TBD
Response to Comments Meeting	05-16-18	07-11-18	08-15-18	TBD
Response to Comments Due	06-05-18	07-25-18	08-31-18	TBD
Draft Final Due	NA	NA	NA	NA
Final Due	06-05-18	07-25-18	08-31-18	TBD
Public Comment Period	NA	NA	NA	NA
Public Meeting	NA	NA	NA	NA

Travis AFB Master Meeting and Document Schedule

INFORMATIONAL POCO DOCUMENTS		
Life Cycle	POCO Evaluation/Closure Report for DERA-funded Oil/Water Separators OW040, OW047, OW048, OW049, OW050, OW052, OW055, OW056, and OW057 Travis AFB, Glenn Anderson CH2M, Doug Berwick	Area of Concern TA500 Data Gap Investigation and Closure Report Travis AFB, Glenn Anderson CH2M, Renee Caird
Scoping Meeting	NA	NA
Predraft to AF/Service Center	02-01-17	12-21-17
AF/Service Center Comments Due	02-15-17	01-08-18
Draft to Agencies	12-19-17	01-23-18
Draft to RAB	12-19-17	01-23-18
Agency Comments Due	01-30-18	02-23-18
Response to Comments Meeting	02-21-18	03-09-18
Response to Comments Due	03-07-18	03-27-18
Draft Final Due	NA	NA
Final Due	03-07-18	03-27-18
Public Comment Period	NA	NA
Public Meeting	NA	NA

Travis AFB Master Meeting and Document Schedule

HISTORY	
Life Cycle	2016 Annual GRISR Travis AFB, Glenn Anderson CH2M, Leslie Royer
Scoping Meeting	NA
Predraft to AF/Service Center	04-21-17
AF/Service Center Comments Due	05-22-17
Draft to Agencies	06-07-17
Draft to RAB	06-07-17
Agency Comments Due	08-10-17 (08-24-17)
Response to Comments Meeting	08-16-17 (09-20-17)
Response to Comments Due	09-01-17 (12-21-17)
Draft Final Due	NA
Final Due	09-01-17 (12-21-17)
Public Comment Period	NA
Public Meeting	NA

South Base Boundary Groundwater Treatment Plant Monthly Data Sheet

Report Number: 207

Reporting Period: 2 January 2018 – 31 January 2018

Date Submitted: 15 February 2018

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 January 2018 reporting period.

Table 1 – Operations Summary – January 2018			
Initial Data Collection:	1/2/2018 15:00	Final Data Collection:	1/31/2018 12:00
Operating Time:	Percent Uptime:	Electrical Power Usage:	
SBBGWTP: 646 hours	SBBGWTP: 93.0%	SBBGWTP: 16,556 kWh (13,051 lbs CO₂ generated^a)	
Gallons Treated: 6.0 million gallons		Gallons Treated Since July 1998: 1,016 million gallons	
Volume Discharged to Union Creek: 6.0 million gallons		Gallons Treated From Other Sources: 0 gallons	
VOC Mass Removed: 1.35 lbs^b		VOC Mass Removed Since July 1998: 497.3 lbs	
Rolling 12-Month Cost per Pound of Mass Removed: \$9,534 ^c			
Monthly Cost per Pound of Mass Removed: \$18,304 ^c			
lbs = pounds ^a SiteWise™ estimate that 1 kilowatt hour generated produces 0.74 pounds of GHG. Value also includes approximately 800 pounds of GHG from GAC change out services averaged to a per month basis. ^b Calculated using January 2018 EPA Method SW8260C analytical results. ^c 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)^a – January 2018							
FT005^b				SS029		SS030	
EW01x05	Offline	EW743x05	Offline	EW01x29	Offline ^c	EW01x30	11.7
EW02x05	Offline	EW744x05	3.5	EW02x29	Offline ^c	EW02x30	6.0
EW03x05	Offline	EW745x05	11.8	EW03x29	2.9	EW03x30	15.1
EW731x05	6.3	EW746x05	Offline	EW04x29	4.5	EW04x30	24.0
EW732x05	Offline	EW2291x05	6.4	EW05x29	5.8	EW05x30	19.4
EW733x05	Offline	EW2782x05	3.7	EW06x29	2.7	EW2174x30	8.8
EW734x05	11.7	EW2783x05	Offline	EW07x29	11.7	EW711x30	8.3
EW735x05	12.7	EW2784x05	8.3				
EW736x05	Offline	EW2785x05	5.7				
EW737x05	Offline	EW2786x05	13.7				
EW742x05	Offline						
FT005 Total: 83.8				SS029 Total: 27.6		SS030 Total: 93.3	
SBBGWTP Average Monthly Flow^d: 154.6 gpm							
^a Flow rates presented are instantaneous measurements taken at the end of the reporting period. ^b 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. ^c Extraction wells taken off line because of persistent fouling of the well pumps and associated discharge piping. ^d 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^a		Restart^a		Cause
	Date	Time	Date	Time	
SBBGWTP	3 January 2018	09:15	3 January 2018	10:15	Backwashed GAC vessels.
SBBGWTP	24 January 2018	14:00	26 January 2018	14:00	Performed carbon change out on lead GAC vessel.
-- = Time not recorded ^a 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 January 2018. Sample results are presented in Table 4. The total VOC concentration (26.96 µg/L) in the influent sample has slightly increased from the December 2017 sample results (25.40 µg/L). TCE was the primary VOC detected in the influent sample at a concentration of 24.9 µg/L. Several VOCs were detected in the midpoint sampling location, including TCE, cis-1,2-DCE, 1,2-DCA, chloroform, and acetone. Acetone is a common laboratory contaminant and not likely a chemical of concern. No VOCs were detected at the effluent sampling location.

Several maintenance activities were conducted at the SBBGWTP in January 2018. On 3 January, the SBBGWTP was shut down for approximately 1 hour to backwash the GAC vessels. Between 24 and 26 January, the SBBGWTP was shut down for approximately 2 days to perform a carbon change out on the lead GAC vessel. In addition, the system bag filters were replaced several times throughout the month.

In January 2018, troubleshooting was performed on several extraction wells. The following list presents the maintenance activities and status of several extraction wells:

- EW03x29 – Cleaned the pressure transducer. Well is currently operating.
- EW04x29 – Cleaned the paddlewheel. Well is currently operating.
- EW05x30 – Replaced motor starter. Well is currently operating.
- EW2291x05 – Adjusted the wellhead flow meter. Well is currently operating.

On 16 January, two Site SS029 extraction wells (EW01x29 and EW02x29) were turned off due to persistent fouling of the well pumps and associated discharge piping. These wells are located in the upgradient portion of the Site SS029/SS016 plume.

Figure 1 presents a plot of influent concentrations and average flow at the SBBGWTP over the past twelve (12) months. An overall increase in the VOC influent concentration has been observed in the past 12 months along with an overall increasing flow rate trend.

Optimization Activities

No optimization activities occurred at the SBBGWTP in January 2018.

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 January 2018, the SBBGWTP produced approximately 13,051 pounds of GHG, which includes approximately 800 pounds of GHG generated from GAC change out services averaged to a per month basis.

TABLE 4

Summary of Groundwater Analytical Data for January 2018 – South Base Boundary Groundwater Treatment Plant

Constituent	Instantaneous Maximum* (µg/L)	Detection Limit (µg/L)	N/C	4 January 2018 (µg/L)		
				Influent	Midpoint	Effluent
Halogenated Volatile Organics						
Acetone	NA	1.0	0	ND	1.91 J	ND
Bromodichloromethane	NA	0.15	0	ND	ND	ND
Carbon Tetrachloride	0.5	0.15	0	ND	ND	ND
Chloroform	5.0	0.15	0	0.18 J	0.18 J	ND
Chloromethane	NA	0.15	0	ND	ND	ND
1,1-Dichloroethane	5.0	0.15	0	ND	ND	ND
1,2-Dichloroethane	0.5	0.15	0	0.36 J	0.38 J	ND
1,1-Dichloroethene	5.0	0.15	0	ND	ND	ND
cis-1,2-Dichloroethene	5.0	0.15	0	1.52	1.90	ND
trans-1,2-Dichloroethene	5.0	0.15	0	ND	ND	ND
Methylene Chloride	5.0	0.15	0	ND	ND	ND
Tetrachloroethene	5.0	0.15	0	ND	ND	ND
1,1,1-Trichloroethane	5.0	0.15	0	ND	ND	ND
1,1,2-Trichloroethane	5.0	0.15	0	ND	ND	ND
Trichloroethene	5.0	0.15	0	24.9	9.55	ND
Vinyl Chloride	0.5	0.15	0	ND	ND	ND
Non-Halogenated Volatile Organics						
Benzene	1.0	0.15	0	ND	ND	ND
Ethylbenzene	5.0	0.15	0	ND	ND	ND
Toluene	5.0	0.15	0	ND	ND	ND
Xylenes	5.0	0.15 – 0.30	0	ND	ND	ND
Other						
Total Petroleum Hydrocarbons – Gasoline	50	35	0	ND	NM	ND
Total Petroleum Hydrocarbons – Diesel	50	24	0	ND	NM	ND
Total Petroleum Hydrocarbons – Motor Oil	50 (trigger)	24	0	ND	NM	ND
1,4-Dioxane	NA	0.19	0	ND	NM	ND

* In accordance with Appendix B of the Travis AFB South Base Boundary Groundwater Treatment Plant Operations and Maintenance Manual (CH2M HILL, 2004).

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

mg/L = milligrams per liter

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

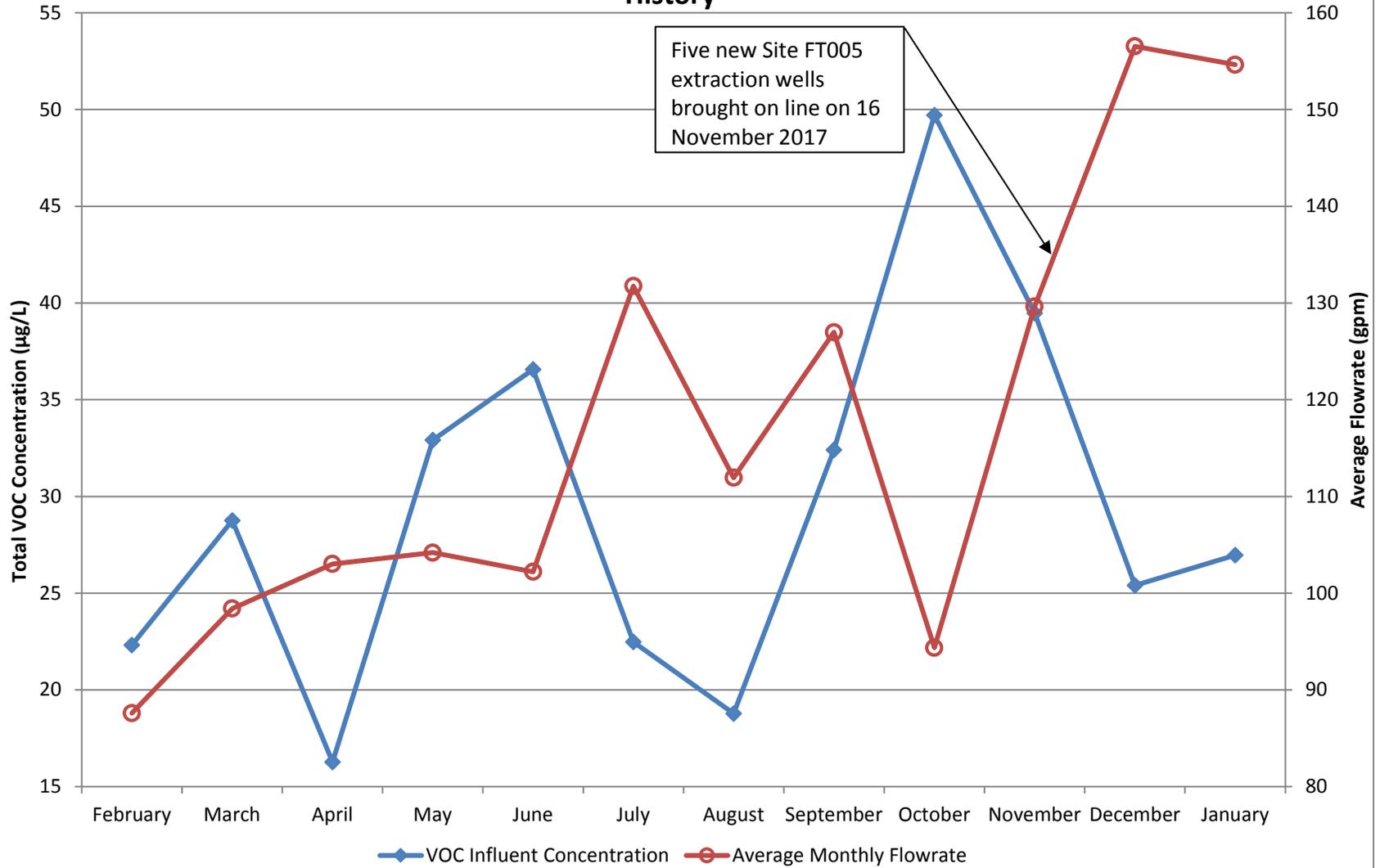
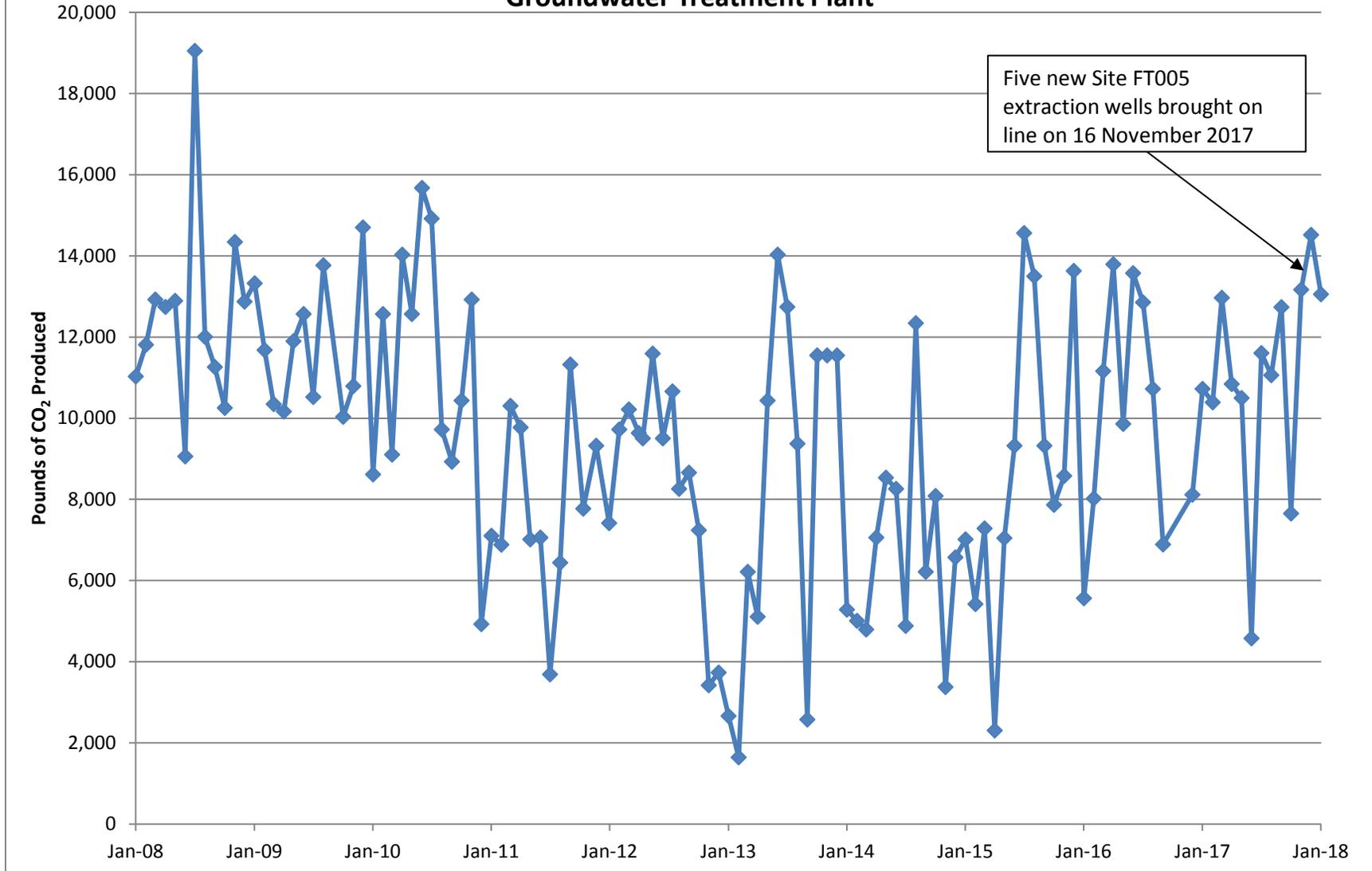


Figure 2
Equivalent Pounds of Carbon Dioxide Produced by the South Base Boundary
Groundwater Treatment Plant



Central Groundwater Treatment Plant Monthly Data Sheet

Report Number: 222

Reporting Period: 3 January 2018 – 30 January 2018

Date Submitted: 15 February 2018

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 January 2018 reporting period.

Table 1 – Operations Summary – January 2018			
Initial Data Collection:	1/3/2018 14:50	Final Data Collection:	1/30/2018 15:10
Operating Time:	Percent Uptime:	Electrical Power Usage:	
CGWTP: 648 hours	CGWTP: 100%	CGWTP:	2,238 kWh (2,544 lbs CO ₂ generated ^a)
Gallons Treated (discharge to storm sewer): 1,192,459 gallons	Gallons Treated Since January 1996: 550.4 million gallons		
VOC Mass Removed from groundwater: 2.21 lbs^b	VOC Mass Removed Since January 1996: 2,796 lbs from groundwater 8,686 lbs from vapor		
Rolling 12-Month Cost per Pound of Mass Removed: \$2,131 ^c			
Monthly Cost per Pound of Mass Removed: \$2,420 ^c			
^a 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.			
^b Calculated using January 2018 EPA Method SW8260C analytical results.			
^c Costs include operations and maintenance, 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^a – January 2018	
Location	Average Flow Rate Groundwater (gpm)
EW001x16	13.4
EW002x16	11.1
EW003x16	0.1
EW605x16	6.5
EW610x16	2.7
CGWTP	30.7
^a Flow rates calculated by dividing total gallons processed by system operating time for the month or the average of the instantaneous readings. gpm = gallons per minute	

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

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

Table 4 presents a twelve-month summary of the Site DP039 bioreactor recirculation well pulsing dates.

Table 4 – Summary of DP039 Bioreactor “Pulsed Mode” Operations		
Location	Pulse-on Date	Pulse-off Date
MW750x39	7 February 2017	7 March 2017
	5 April 2017	7 August 2017
	7 September 2017	2 October 2017
	6 November 2017	27 November 2017
	26 December 2017	22 January 2018
MW = Monitoring Well		

Summary of O&M Activities

Monthly groundwater treatment samples were collected at the CGWTP on 4 January 2018. Sample results are presented in Table 5. The total VOC concentration (222.02 µg/L) in the January 2018 influent sample has increased from the December 2017 sample (214.34 µg/L). TCE was the primary VOC detected in the influent sample at a concentration of 175 µg/L. Cis-1,2-DCE (16.7 µg/L) was detected in the sample collected after the first carbon vessel, and vinyl chloride (0.20 µg/L) was detected in the sample collected after the second carbon vessel. No VOC constituents were detected in the effluent sample. Acetone was detected in the sample after the second carbon vessel; however, acetone is a common laboratory contaminant and not likely a chemical of concern. Travis AFB will continue to monitor influent, midpoint, and effluent concentrations at the CGWTP for carbon breakthrough, though the carbon treatment remained effective in January 2018. A carbon change out on the lead GAC vessel is being coordinated.

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 decreasing trend over the past 12 months along with an overall decreasing trend for the flow rate through the treatment plant. The reduction in flow rate is likely a seasonal fluctuation.

The Site DP039 subgrade biogeochemical reactor (SBGR), also known as a bioreactor, continued to operate in a four-week “pulsed mode” to optimize distribution of total organic carbon (TOC). The bioreactor was taken off line on 22 January as planned.

Optimization Activities

No optimization activities occurred at the CGWTP in January 2018.

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 2,544 pounds of GHG during January 2018, which is a decrease from the December 2017 amount of 2,620 pounds.

TABLE 5

Summary of Groundwater Analytical Data for January 2018 – Central Groundwater Treatment Plant

Constituent	Instantaneous Maximum* (µg/L)	Detection Limit (µg/L)	N/C	4 January 2018 (µg/L)			
				Influent	After Carbon 1 Effluent	After Carbon 2 Effluent	System Effluent
Halogenated Volatile Organics							
Acetone	NA	1.0	0	ND	ND	1.66 J	ND
Carbon Tetrachloride	0.5	0.15	0	ND	ND	ND	ND
Chloroform	5.0	0.15	0	ND	ND	ND	ND
Chloromethane	NA	0.15	0	ND	ND	ND	ND
cis-1,2-Dichloroethene	5.0	0.15	0	41.5	16.7	ND	ND
1,2-Dichlorobenzene	5.0	0.15	0	0.52	ND	ND	ND
1,3-Dichlorobenzene	5.0	0.15	0	0.76	ND	ND	ND
1,4-Dichlorobenzene	5.0	0.15	0	0.36 J	ND	ND	ND
1,1-Dichloroethane	5.0	0.15	0	ND	ND	ND	ND
1,2-Dichloroethane	0.5	0.15	0	ND	ND	ND	ND
1,1-Dichloroethene	5.0	0.15	0	0.55	ND	ND	ND
Methylene Chloride	5.0	0.15	0	ND	ND	ND	ND
Methyl tert-Butyl Ether	1.0	0.15	0	ND	ND	ND	ND
Tetrachloroethene	5.0	0.15	0	0.52	ND	ND	ND
1,1,1-Trichloroethane	5.0	0.15	0	ND	ND	ND	ND
1,1,2-Trichloroethane	5.0	0.15	0	ND	ND	ND	ND
trans-1,2-Dichloroethene	5.0	0.15	0	2.55	ND	ND	ND
Trichloroethene	5.0	0.15 – 1.5	0	175	ND	ND	ND
Vinyl Chloride	0.5	0.15	0	0.26 J	ND	0.20 J	ND
Non-Halogenated Volatile Organics							
Benzene	1.0	0.15	0	ND	ND	ND	ND
Ethylbenzene	5.0	0.15	0	ND	ND	ND	ND
Toluene	5.0	0.15	0	ND	ND	ND	ND
Total Xylenes	5.0	0.15 – 0.30	0	ND	ND	ND	ND
Other							
Total Petroleum Hydrocarbons – Gasoline	50	35	0	60.1 J	NM	NM	ND
Total Petroleum Hydrocarbons – Diesel	50	24	0	36.7 J	NM	NM	ND
Total Petroleum Hydrocarbons – Motor Oil	50 (trigger)	24	0	ND	NM	NM	ND
1,4-Dioxane	NA	0.19	0	ND	NM	NM	ND

* In accordance with Appendix G of the Travis AFB Central Groundwater Treatment Plant Operations and Maintenance Manual (URS Group, Inc., 2002).

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

mg/L = milligrams per liter

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

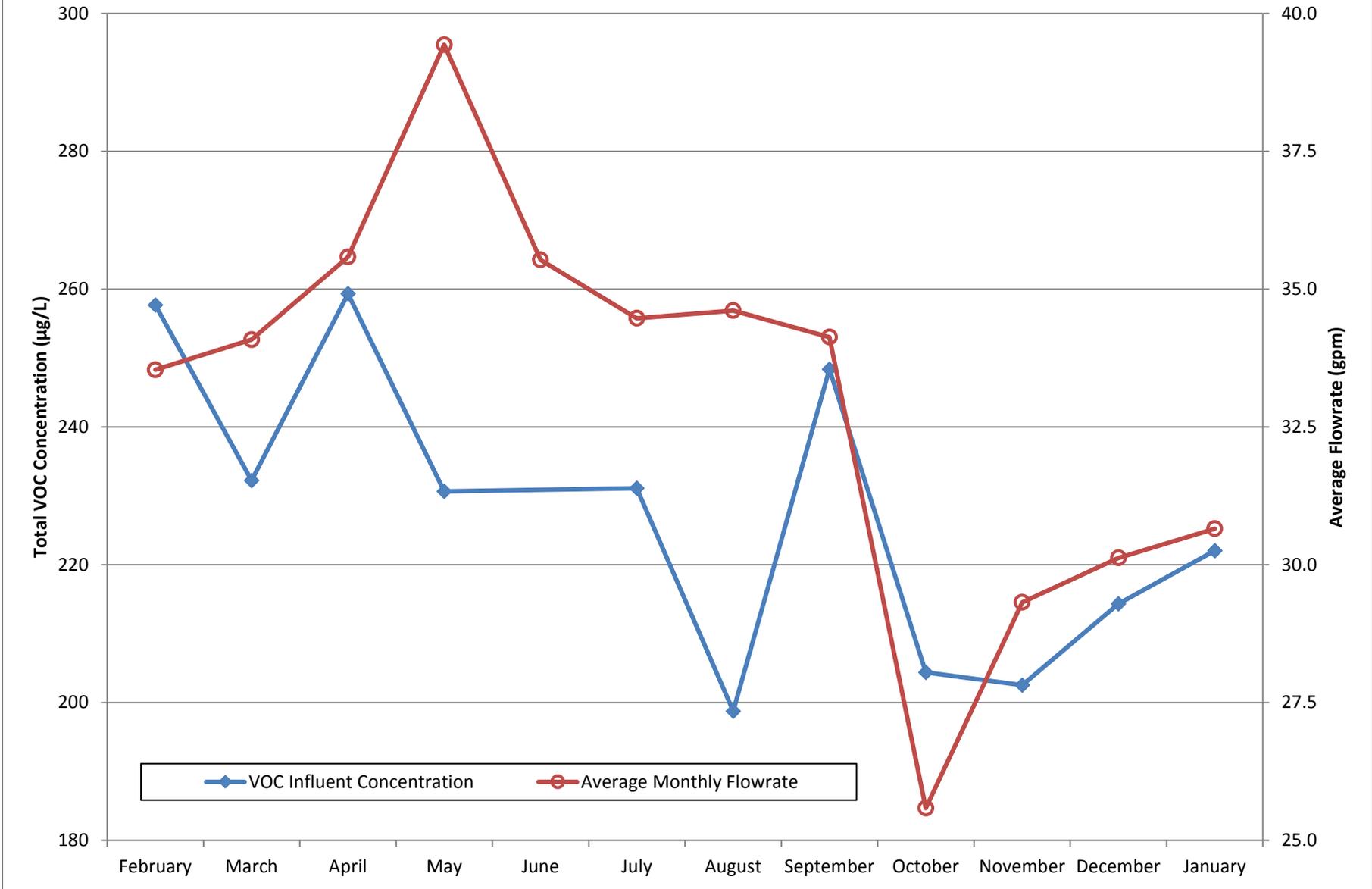
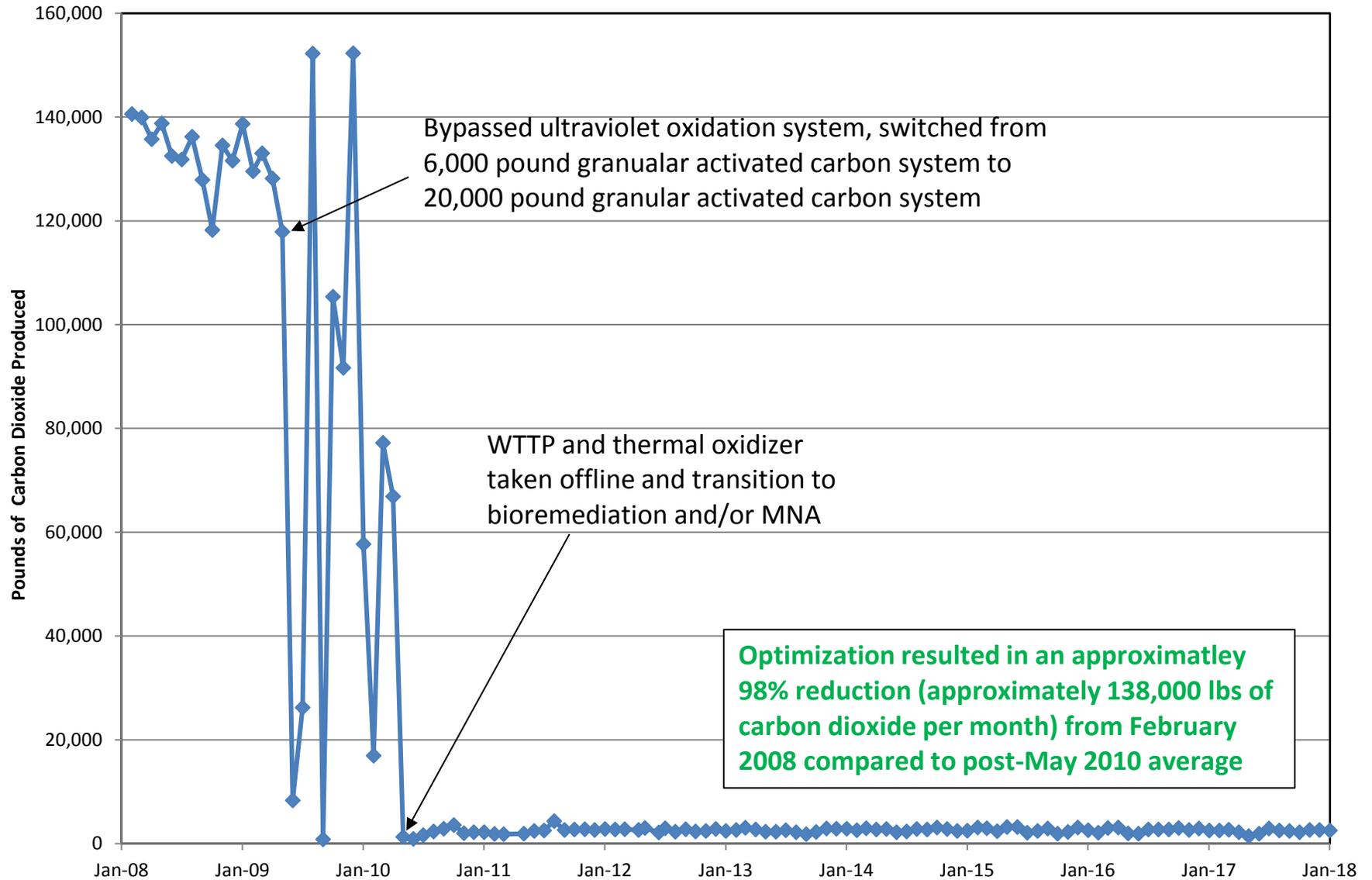


Figure 2

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



Subarea LF007C Groundwater Treatment Plant Monthly Data Sheet

Report Number: 166

Reporting Period: 3 January 2018 – 31 January 2018

Date Submitted: 15 February 2018

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 January 2018 reporting period:

Table 1 – Operations Summary – January 2018			
Initial Data Collection:	1/3/2018 13:00	Final Data Collection:	1/31/2018 10:45
Operating Time:	Percent Uptime:	Electrical Power Usage ^a :	
LF007C GWTP: 612 hours	LF007C GWTP 91%	LF007C GWTP: 0 kWh	
Gallons Treated: 118,030 gallons		Gallons Treated Since March 2000: 87.0 million gallons	
Volume Discharged to Duck Pond: 118,030 gallons		VOC Mass Removed Since March 2000: 174.38 pounds (Groundwater)	
VOC Mass Removed: 1.53 x 10⁻³ pounds^b			
Rolling 12-Month Cost per Pound of Mass Removed: Not Measured^c			
Monthly Cost per Pound of Mass Removed: Not Measured^c			
^a The LF007C GWTP operates on solar power only. ^b VOCs from January 2018 influent sample detected by EPA Method SW8260C. ^c 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 – January 2018		
Location	Average Flow Rate (gpm) ^a	Total Gallons Processed (gallons)
EW614x07	3.0	108,820
EW615x07	0.2	8,730
LF007C GWTP	3.2	118,030
^a Flow rates calculated by dividing total gallons processed by system operating time for the month or the average of the instantaneous readings. gpm = gallons per minute		

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

Table 3 – Summary of System Shutdowns					
Location	Shutdown^a		Restart^a		Cause
	Date	Time	Date	Time	
LF007C GWTP	8 January 2018	01:45	10 January 2018	12:45	Treatment pad flooded with rainwater.
-- = Time not recorded					
^a 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 January 2018. Sample results are presented in Table 4. TCE (1.40 µg/L) and cis-1,2-DCE (0.16 J µg/L) were detected at the influent sample location. In addition, TPH-d (90.4 J µg/L), TPH-mo (46 J µg/L), and 1,4-dioxane (0.27 J µg/L) were detected at the influent sample location. No VOC contaminants were detected at the midpoint and effluent sampling locations. However, the effluent sample identified TPH-D at a concentration (69.2 J µg/L) in excess of the effluent limitation of 50 µg/L. In addition, and 1,4-dioxane was detected in the effluent sample at a concentration of 0.32 J µg/L.

Between August and January 2018, TPH-d and/or TPH-mo were detected at concentrations exceeding the effluent limitations. Confirmation sampling results in September suggested that the TPH detections are not related to fuels contamination. The cause of the TPH-d and TPH-mo detections was investigated during basewide sampling in October 2017. During that sampling event, both Subarea LF007C extraction wells (EW614x07 and EW615x07) and background well MW210x06 were sampled and analyzed for TPH as gasoline (MW210x06 only), diesel, and motor oil (TPH-g, TPH-d, and TPH-mo), VOCs, and semi-volatile VOCs. The samples collected for TPH-d and TPH-mo did not undergo silica gel cleanup (SGC) by the lab, as requested. Additional samples from EW614x07, EW615x07, and MW210x06 were collected in January 2018 and TPH-d and TPH-mo was analyzed with and without SGC. These sample results are presented in Table 5.

Between 8 and 10 January, the LF007C GWTP was shut down because the treatment pad was flooded with rainwater. Between 15 and 18 January, a sump pump and storage container was installed at LF007C GWTP to automatically pump rainwater into the storage container to minimize the down time at the plant.

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 slightly decreasing. 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 January 2018.

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 now a solar-only operated treatment system and no longer generates 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 January 2018 – Subarea LF007C Groundwater Treatment Plant

Constituent	Instantaneous Maximum* (µg/L)	Detection Limit (µg/L)	N/C	4 January 2018 (µg/L)		
				Influent	After Carbon 1	Effluent
Halogenated Volatile Organics						
Acetone	NA	0.50	0	ND	ND	ND
Bromodichloromethane	5.0	0.15	0	ND	ND	ND
Bromoform	5.0	0.15	0	ND	ND	ND
2-Butanone	5.0	2.0	0	ND	ND	ND
Carbon Tetrachloride	0.5	0.15	0	ND	ND	ND
Chloroform	5.0	0.15	0	ND	ND	ND
Dibromochloromethane	5.0	0.15	0	ND	ND	ND
1,3-Dichlorobenzene	5.0	0.15	0	ND	ND	ND
1,4-Dichlorobenzene	5.0	0.15	0	ND	ND	ND
1,1-Dichloroethane	5.0	0.15	0	ND	ND	ND
1,2-Dichloroethane	0.5	0.15	0	ND	ND	ND
1,1-Dichloroethene	5.0	0.15	0	ND	ND	ND
cis-1,2-Dichloroethene	5.0	0.15	0	0.16 J	ND	ND
trans-1,2-Dichloroethene	5.0	0.15	0	ND	ND	ND
Methylene Chloride	5.0	0.15	0	ND	ND	ND
Tetrachloroethene	5.0	0.15	0	ND	ND	ND
1,1,1-Trichloroethane	5.0	0.15	0	ND	ND	ND
1,1,2-Trichloroethane	5.0	0.15	0	ND	ND	ND
Trichloroethene	5.0	0.15	0	1.40	ND	ND
Vinyl Chloride	0.5	0.15	0	ND	ND	ND
Non-Halogenated Volatile Organics						
Benzene	1.0	0.15	0	ND	ND	ND
Ethylbenzene	5.0	0.15	0	ND	ND	ND
Toluene	5.0	0.15	0	ND	ND	ND
Xylenes	5.0	0.15 – 0.30	0	ND	ND	ND
Other						
Total Petroleum Hydrocarbons – Gasoline	50	35	0	ND	NM	ND
Total Petroleum Hydrocarbons – Diesel	50	24	1	90.4 J	NM	69.2 J
Total Petroleum Hydrocarbons – Motor Oil	50	24	0	46.0	NM	ND
1,4-Dioxane	NA	0.19	0	0.27 J	NM	0.32 J

* In accordance with Appendix G of the *Travis AFB North Groundwater Treatment Plant Operations and Maintenance Manual*, Sites FT004, SD031, and LF007 Area C (URS Group, Inc., 2005).

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

TABLE 5

Summary of Groundwater Analytical Data for January 2018 – Subarea LF007C Groundwater Treatment Plant

Constituent	Detection Limit (µg/L)	16 January 2018 (µg/L)		
		EW614x07	EW615x07	MW210x06
Halogenated Volatile Organics				
cis-1,2-Dichloroethene	0.15	ND	ND	ND
Trichloroethene	0.15	1.26	ND	ND
Non-Halogenated Volatile Organics				
Benzene	0.15	ND	0.45 J	ND
Ethylbenzene	0.15	ND	ND	ND
Toluene	0.15	ND	ND	ND
Xylenes	0.15 – 0.30	ND	ND	ND
Other				
Total Petroleum Hydrocarbons – Gasoline	35	ND	ND	ND
Total Petroleum Hydrocarbons – Diesel without SGC	24	85.4 J	358	28.4 J
Total Petroleum Hydrocarbons – Diesel with SGC	24	36.0 J	75.0 J	45.1 J
Total Petroleum Hydrocarbons – Motor Oil without SGC	24	48.0 J	757	42.9 J
Total Petroleum Hydrocarbons – Motor Oil with SGC	24	ND	157	54.4 J
Semivolatile Organic Compounds	0.27 – 7.6	ND	ND	ND

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

SGC = silica gel cleanup

µg/L = micrograms per liter

Figure 1
LF007CGWTP Total VOC Influent Concentrations and Average Flowrate Twelve Month History

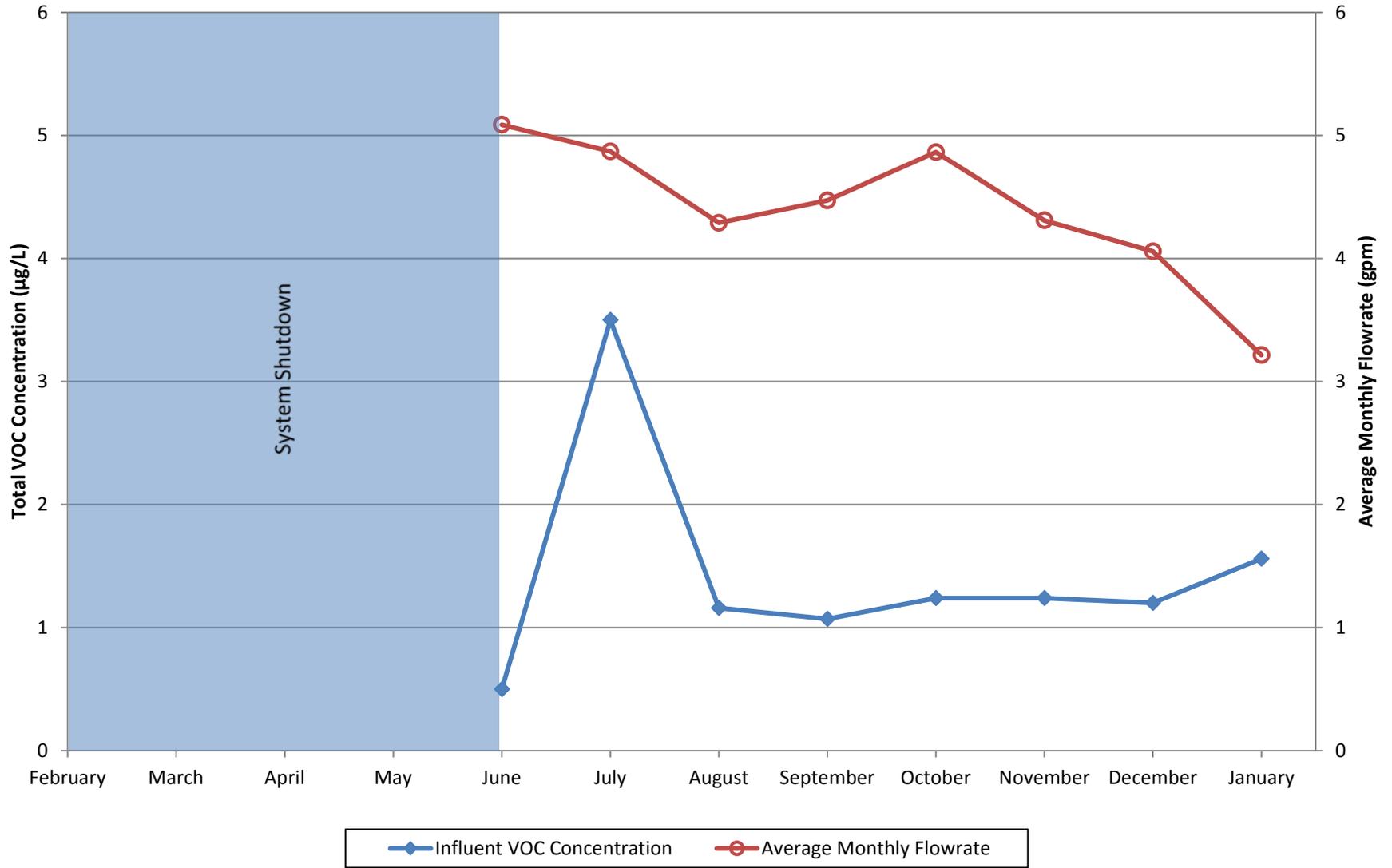
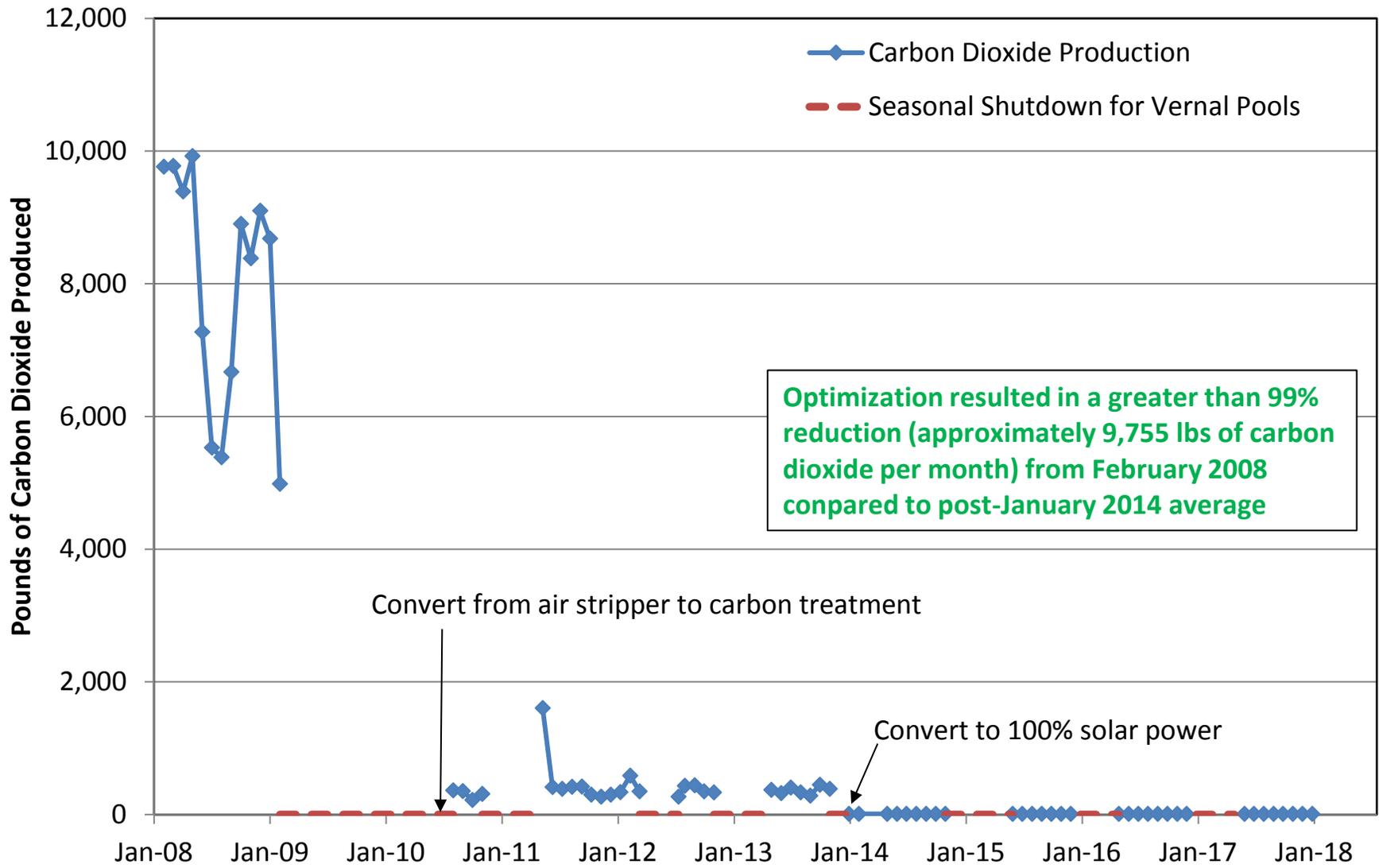


Figure 2
Equivalent Pounds of Carbon Dioxide Produced by the NGWTP/LF007C GWTP



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: 083

Reporting Period: 2 January 2018 – 2 February 2018

Date Submitted: 15 February 2018

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

System Metrics

Table 1 presents operation data from the January 2018 reporting period.

Table 1 – Operations Summary – January 2018	
Initial Data Collection: 1/2/2018 13:00	Final Data Collection: 2/2/2018 11:15
Operating Time: ST018GWTP: 742 hours	Percent Uptime: ST018GWTP: 100%
	Electrical Power Usage: ST018GWTP: 65 kWh (48 lbs CO₂ generated^a)
Gallons Treated: 116,140 gallons	Gallons Treated Since March 2011: 14.1 million gallons
Volume Discharged to Sanitary Sewer: 116,140 gallons	Final Totalizer Reading: 14,074,899 gallons
Cumulative Volume Discharged to Sanitary Sewer since 1 November 2014: 7,578,725 gallons	
MTBE, BTEX, VOC, TPH Mass Removed: 0.06 lbs^b	MTBE, BTEX, VOC, TPH Mass Removed Since March 2011: 42.9 lbs
MTBE (Only) Removed: 0.01 lbs^b	MTBE (Only) Mass Removed Since March 2011: 10.6 lbs
Rolling 12-Month Cost per Total Pounds of Mass Removed: \$15,037 ^{bc}	
Monthly Cost per Pound of Mass Removed: \$51,170 ^{bc}	
^a SiteWise™ estimate that 1 kilowatt hour generated produces 0.74 pounds of GHG. ^b Calculated using January 2018 EPA Method SW8260C and SW8015B analytical results. ^c 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.

Table 2 – ST018GWTP Average Flow Rates – January 2018		
Location	Average Flow Rate Groundwater (gpm)^a	Hours of Operation
EW2014x18	0.7	363
EW2016x18	0.7	363
EW2019x18	1.0	742
EW2333x18	1.6	317
ST018GWTP	2.6	742

^a Flow rates calculated by dividing total gallons processed by amount of operating time of the pump/system.
gpm = gallons per minute
ST018GWTP = Site ST018 Groundwater Treatment Plant

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

Table 3 – Summary of System Shutdowns					
Location	Shutdown^a		Restart^a		Cause
	Date	Time	Date	Time	
ST018GWTP	None.	--		--	None.

-- = Time not recorded
^a Shutdown and restart times estimated based on field notes
ST018GWTP = Site ST018 Groundwater Treatment Plant

Table 4 presents the Site ST018 pulsing dates.

Table 4 – Summary of Site ST018 “Pulsed Mode” Operations	
Pulse-on Date (All Extraction Wells Operational)	Pulse-off Date (EW2019x18 Operational Only)
	4 October 2017
16 October 2017	31 October 2017
14 November 2017	27 November 2017
11 December 2017	26 December 2017
8 January 2018	22 January 2018
1 February 2018	

Summary of O&M Activities

Monthly groundwater treatment samples were collected at the ST018GWTP on 4 January 2018. During the sampling, EW2019x18 was the only operational extraction well due to pulsed operation of the system. Results are presented in Table 5. The complete January 2018 laboratory data report is available upon request. The influent concentration for MTBE during the January 2018 sampling event was 0.51 µg/L, which is a decrease from the December 2017 sample result of 1.16 µg/L. TPH-d and acetone were also detected in the influent sample. Acetone is a common laboratory contaminant and not likely a chemical of concern. MTBE was detected in the system effluent sampling location at a concentration less than the effluent limitations.

All concentrations of TPH are well below the Fairfield-Suisun Sewer District effluent limitation of 50,000 µg/L for TPH-g and TPH-d, or 100,000 µg/L for TPH-mo. Additionally, the Fairfield-Suisun Sewer District does not currently have a local 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 influent and effluent contaminant concentrations to maintain compliance with the Fairfield-Suisun Sewer District discharge permit.

In January 2018, three (3) of the four (4) extraction wells (EW2014x18, EW2016x18, and EW2333x18) continued to operate in a two-week “pulse-mode” (two weeks off, two weeks on, two weeks off, and so forth). As shown in Table 4, on 8 January, wells EW2014x18 and EW2016x18 were restarted in the pulsed-on mode. On 10 January, a new pump was installed in EW2333x18, and the extraction well was restarted. On 22 January, the three extraction wells were taken off line. When the ST018GWTP operates in pulsed-off mode, only the furthest downgradient extraction well EW2019x18 operates continuously.

On 10 January, shortly after the startup of EW2333x18 and approximately 2 days after EW2014x18 and EW2016x18 were restarted, groundwater treatment samples were collected and analyzed for VOCs at the ST018GWTP. Results are presented in Table 6. The influent concentration for MTBE increased to 4.52 µg/L. Benzene was also detected in the influent sample. Based on this data and the analytical results from the previous 4 months, MTBE concentrations did not significantly increase from pulsed-mode operation. Therefore, on 1 February, all the extraction wells were restarted and will remain continuously operational.

Figure 1 presents plots of the average flow rate and influent total contaminant (MTBE, TPH-g, TPH-d, TPH-mo, BTEX, and VOCs) and MTBE concentrations at the ST018GWTP over the past twelve (12) months. The average flow rate through the ST018GWTP has been cyclical with flow rates decreasing following the wet rainy 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 because of the “pulse-mode” operations. The MTBE concentration and total influent concentrations have generally been fluctuating over the past 12 months with an overall decreasing trend.

Optimization Activities

Optimization activities this month at the ST018GWTP include experimenting with operating the system in a pulsed mode. As discussed above, three (3) of the four (4) extraction wells are operating in a two-week “pulse-mode” operation. Travis AFB tracked the performance of operating in pulsed mode, as compared against month-over-month results from 2016, 2017, and January 2018. Through January 2018, upon turning the three (3) pulsed extraction wells back on line, influent samples have been collected to see if captured MTBE concentrations have increased. These samples have been collected 1 hour, 5 hours, approximately 24 hours, and approximately 48 hours after turning the pulse wells back on. Based on these sample results, the pulsed mode operation does not appear to be effective for increased MTBE capture at the Site ST018GWTP. Therefore, on 1 February 2018, all the extraction wells were restarted, and the pulsed mode operation will be terminated.

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 ST018GWTP system.

Figure 2 presents the historical GHG production from the ST018GWTP. The ST018GWTP produced 48 pounds of GHG during January 2018 and treated 116,140 gallons of water, which was an increase from December 2017 (37 pounds, treating 89,960 gallons). The amount of GHG produced is directly attributed to the amount of water treated through the system because the only line-power electrical use is for a transfer pump through the GAC system.

TABLE 5

Summary of Groundwater Analytical Data for January 2018– Site ST018 Groundwater Treatment Plant

Constituent	Instantaneous Maximum* (µg/L)	Detection Limit (µg/L)	N/C	4 January 2018** (µg/L)	
				Influent	System Effluent
Fuel Related Constituents					
Methyl tert-Butyl Ether	6,400	0.15	0	0.51	1.42
Benzene	25,000 ^a	0.15	0	ND	ND
Ethylbenzene	25,000 ^a	0.15	0	ND	ND
Toluene	25,000 ^a	0.15	0	ND	ND
Total Xylenes	25,000 ^a	0.15 – 0.30	0	ND	ND
Total Petroleum Hydrocarbons – Gasoline	50,000 ^b	35	0	ND	ND
Total Petroleum Hydrocarbons – Diesel	50,000 ^b	24	0	62.6 J	ND
Total Petroleum Hydrocarbons – Motor Oil	100,000	24	0	ND	ND
Other					
Acetone	NA	1.0	0	1.79 J	ND
1,2-Dichloroethane	20	0.15	0	ND	ND

* In accordance with the Fairfield-Suisun Sewer District Effluent Limitations

** During the sampling event, only EW2019x18 was operational
Laboratory data available on request.

a – The limit of 25,000 µg/L is a combined limit for BTEX.

b – 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

TABLE 6

Summary Of Groundwater Analytical Data for January 2018– Site ST018 Groundwater Treatment Plant

Constituent	Instantaneous Maximum* (µg/L)	Detection Limit (µg/L)	N/C	10 January 2018** (µg/L)
				Influent
Fuel Related Constituents				
Methyl tert-Butyl Ether	6,400	0.15	0	4.52
Benzene	25,000 ^a	0.15	0	0.48 J
Ethylbenzene	25,000 ^a	0.15	0	ND
Toluene	25,000 ^a	0.15	0	ND
Total Xylenes	25,000 ^a	0.15 – 0.30	0	ND

* In accordance with the Fairfield-Suisun Sewer District Effluent Limitations

** During the sampling event, extraction wells had been operational for approximately 48 hours

Laboratory data available on request.

a – The limit of 25,000 µg/L is a combined limit for BTEX.

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 Influent Concentrations
and Average Flowrate Twelve Month History

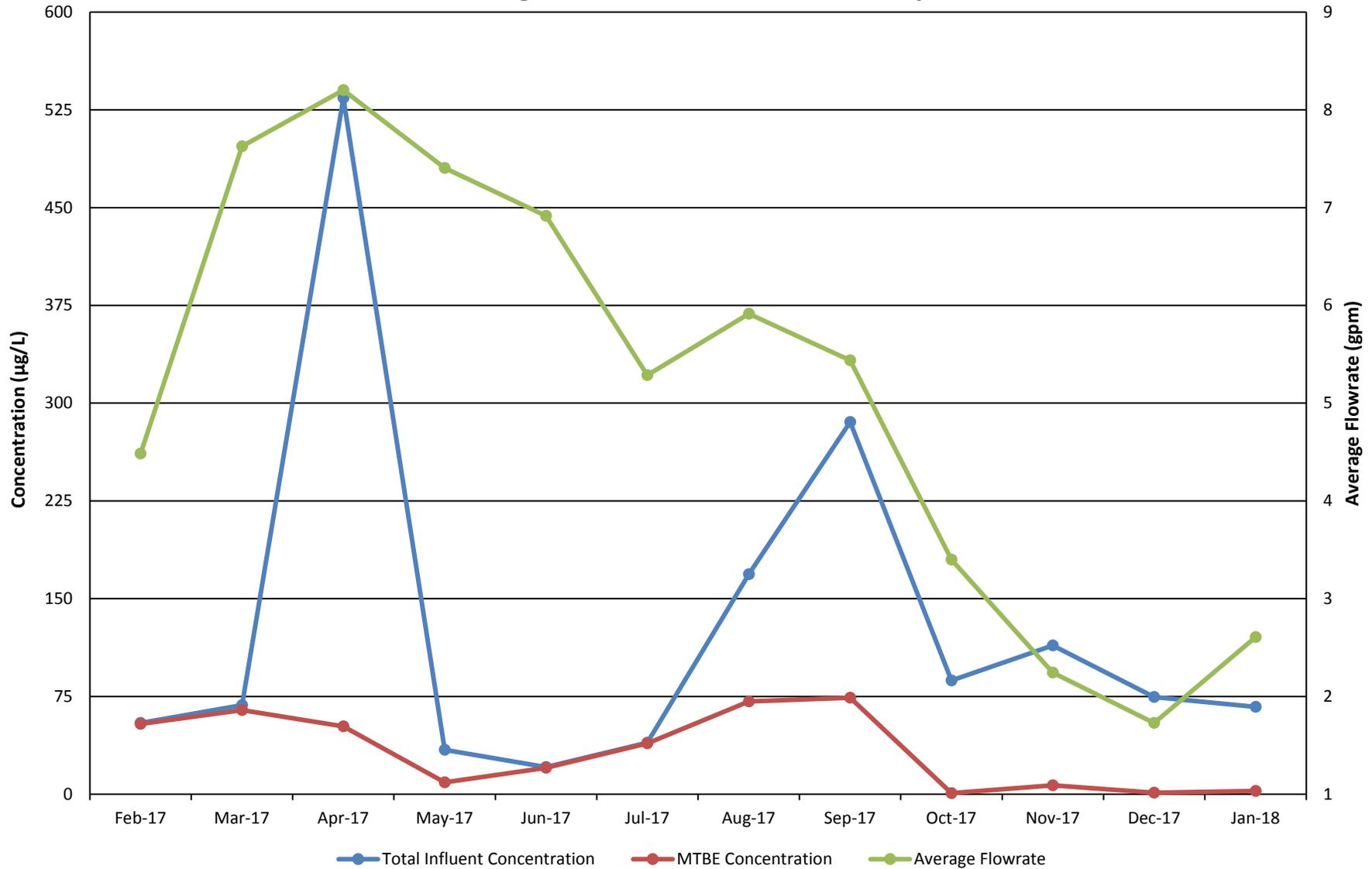
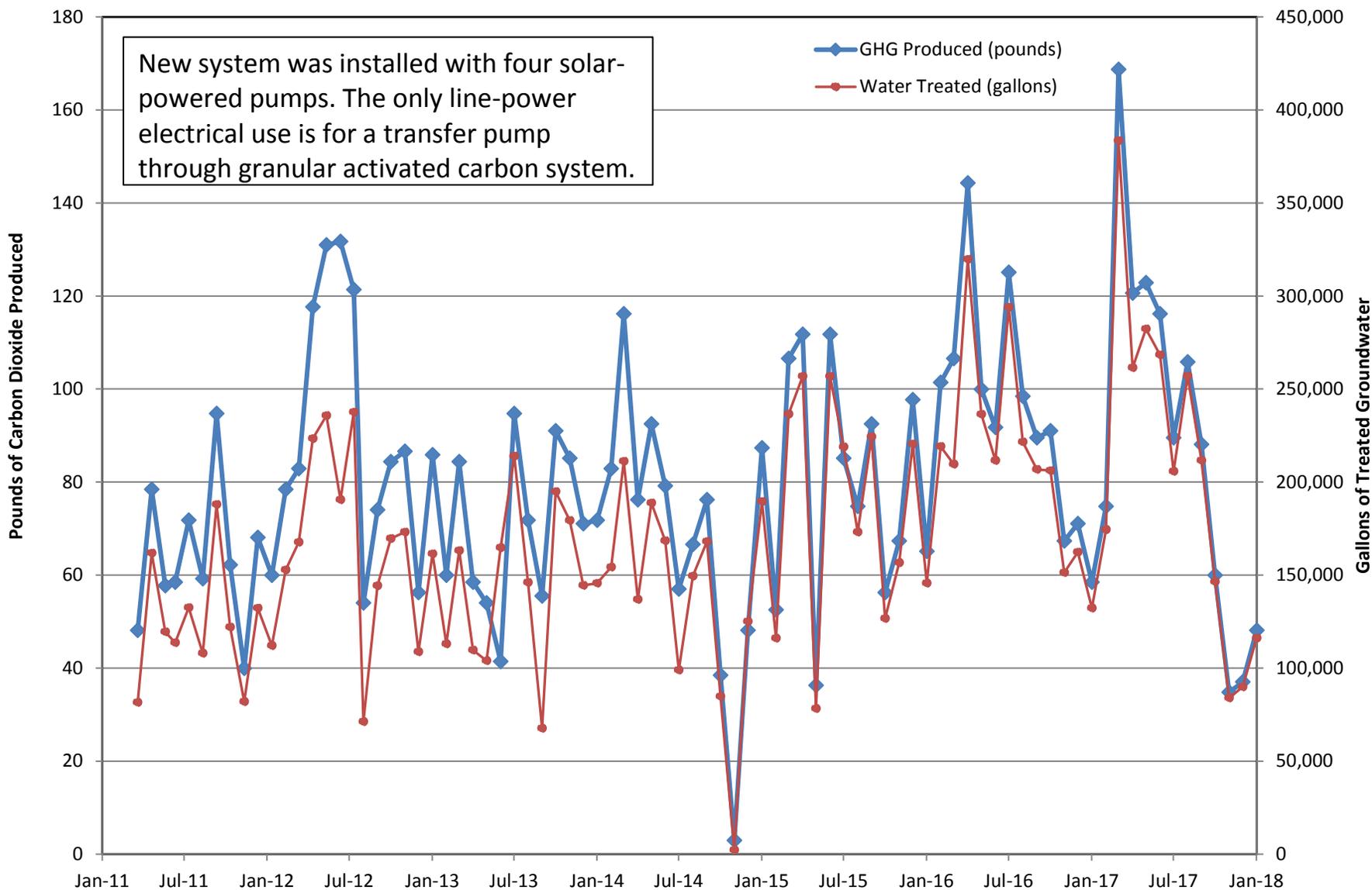


Figure 2

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



TPH Detections at Subarea LF007C

Investigation Samples

- Three wells sampled to investigate
 - EW614x07 – One of two wells feeding the LF007C GWTP
 - EW615x07 – Two of two wells feeding the LF007C GWTP
 - MW210x06 – Background well located approximately 1,000 feet cross gradient from the extraction wells
- Sampled on two dates
 - 26 October 2017
 - 16 January 2018
- Analyses
 - TPH-D/MO with and without silica gel cleanup
 - SVOCs
 - VOCs

Sampling results

EW614x07	TPH-D	TPH-D (SGC)	TPH-MO	TPH-MO (SGC)	SVOCs	TCE
10/26/2017	ND	ND	63 J-	99 J-	ND	1.4
10/26/2017	ND	ND	68 J-	91 J-	ND	1.4
1/16/2018	85.4 J	36 J	48 J	ND	ND	1.26

EW615x07	TPH-D	TPH-D (SGC)	TPH-MO	TPH-MO (SGC)	2-Methyl naphthalene	Naphthalene	Benzene
10/26/2017	ND	ND	100 J-	ND	0.3 J	0.31 J	3.8 J-
1/16/2018	358	75 J	757	157	ND	ND	0.45 J

MW210x06	TPH-D	TPH-D (SGC)	TPH-MO	TPH-MO (SGC)	SVOCs	VOCs
10/26/2017	ND	420 J+	ND	440 J	ND	ND
1/16/2018	28.4 J	45.1 J	42.9 J	54.4 J	ND	ND

Conclusions

- TPH detections have been inconsistent
 - Data is not indicative of a petroleum release
 - Likely affected by biogenic sources
 - Not a reliable indicator of potential risk at this site
- More appropriate to analyze for VOCs and SVOCs moving forward

Travis AFB Restoration Program

Program Update

RPM Meeting
February 21, 2018

Completed Documents (1)

- Vapor Intrusion Assessment Update Technical Memorandum
- 2012 CAMU Annual Report
- Old Skeet Range Action Memorandum
- 3rd 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***

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 (2nd 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 (3rd 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 (1st 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 (2nd 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**

Documents In-Progress

CERCLA

- Community Relations Plan Update
- Data Gap Investigation Results, Technical Memorandum for Site SS016
- Amendment to the WABOU Soil ROD for sites DP039, SD043, and SS046
- TS060 Removal Action Completion Report
- SS035 Site Closure Report

POCO

- POCO Evaluation/Closure Report for DERA-funded Oil/Water Separators OW040, OW047, OW048, OW049, OW050, OW052, OW055, OW056, and OW057
- ***AOC TA500 Data Gaps Investigation and Closure Report***

Field Work In-Progress

CERCLA

- ***SD037 EVO reinjection***

POCO

- None

Documents Planned

CERCLA

- Monitoring Well Installation Tech Memo for Site DP039, Addendum to the RACCR Mar
- SD043 RD/RA Work Plan Mar
- LF006, SS030, SD031 Aquifer Test Activities Tech Memo Mar
- **Site TS060 No Further Action Proposed Plan** **Mar**
- SD031 Soil RI/FS Apr
- Amendment to the NEWIOU Soil ROD for Sites SS016 and SD033 Apr
- SS046 RD/RA Work Plan Apr
- FT005 Extraction System Optimization Tech Memo Apr
- **SS015 Soil Sampling Plan** **Apr**
- **2017 Annual CAMU Monitoring Report** **May**
- EVO Sites FT004, SS015, SD031, & SD036 Optimization Injections Tech Memo Jun
- **2017 Annual GRISR** **Jun**
- **LF044 Sediment Sampling Report** **TBD**
- **SS016 RD/RA Work Plan** **TBD**¹²

Documents Planned

POCO

- None

Field Work Planned

CERCLA

- Q2 2018 GRIP Sampling Apr
- SD034 Install barricade around SBGR May
- SD034 Repair collar around EW2450x34 Summer
- SD043 Soil excavation Summer
- SS046 Soil excavation Summer
- SS016 Soil excavation Summer
- SS015 Soil sampling Summer

POCO

- FT004 POCO Soil Investigation Summer

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

Petroleum Technology Demonstration Projects (1)

- SS014: Recycled Drywall 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 first 9 months**
 - **TPH-G: 99% reduction in source area (1,900 to 15 J $\mu\text{g/L}$), 34% for remaining 6 site wells (was 18% after 3 months)**
 - **TPH-D: 98% reduction in source area (5,500 to 130 J $\mu\text{g/L}$), 61% for remaining 6 site wells (was 33% after 3 months)**
 - **Benzene: 98% reduction (22 to 0.24 J $\mu\text{g/L}$), 61% for remaining 6 site wells (was 49% after 3 months)**
- SD034: Washboard SBGR
 - Evaluate the effectiveness of an oxygen-enhanced aerobic SBGR on reducing TPH as diesel (TPH-D) in groundwater
 - Installed six (6) SBGR trenches in November 2016
 - **Below SBGR trench (MW811x34/PZSSAx34) through first 9 months**
 - **TPH-DRO baseline 9,600 $\mu\text{g/L}$ reduced to 160 $\mu\text{g/L}$ (98% reduction)**
 - **TPH-MRO baseline 2,300 $\mu\text{g/L}$ reduced to 210 $\mu\text{g/L}$ (91% reduction)**
 - **Plume hot spot monitoring well (MW02x34) through first 9 months**
 - **TPH-DRO baseline 8,300 $\mu\text{g/L}$ reduced to 1,100 $\mu\text{g/L}$ (87% reduction)**
 - **TPH-MRO baseline 1,500 $\mu\text{g/L}$ reduced to 420 $\mu\text{g/L}$ (72% reduction)**

* SBGR = Subgrade Biogeochemical Reactor

Updates in Green Font

CVOC Technology Demonstration Projects (2)

- Multisite Bioaugmentation: EVO and KB-1 Plus
 - Evaluate if addition of bioaugmentation substrate to an EVO injection will increase the rate of CVOC degradation
 - Initial injections were completed (Nov 2016)
 - Limited TOC dispersal at SD036, so installed additional injection wells and reinjected with nanoEVO in 2017
 - Too early to evaluate degradation rates; **however:**
 - **~50-70% TCE reduction at ST027B bioaugmentation area and low/fluctuating reductions at EVO only area**
 - **TCE fluctuations at SD036 bioaugmentation area (but 62% DCE decrease) and 99% decrease at EVO only area**
- 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
 - Installation completed May 2016
 - Slightly elevated TOC and reduced COC concentrations in the north, **TOC increase has not yet been observed in the central test area yet (distance may be too far for TOC dispersal using EVO)**
 - Optimized the GETs in southern portion of site in 2017, which may help accelerate TOC dispersal to support this TD

Updates in Green Font

CVOC Technology Demonstration Projects (3)

- 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
 - COC concentrations declined through year 1
 - ~50% total molar reduction plume-wide through first year
 - Max monitoring well TCE concentration reduced from 560 to 140 µg/L
 - Limited TOC dispersal, additional EVO injection conducted with nanoEVO in 2017 to determine if this can enhance TOC dispersal **(too early to evaluate results of reinjection)**
 - **Concentrations rebounded in 4Q17, but 2017 reinjection should support further reductions**

Updates in Green Font

CVOC Technology Demonstration Projects (4)

- SD031: EVO distribution via Gravel Chimneys
 - 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
 - Early indications:
 - Reducing conditions have initiated as expected throughout the TD area and are supporting anaerobic degradation
 - TOC concentrations are increasing at several wells
 - Recirculation through chimneys has been successful relative to our design assumptions
 - 1,1-DCE (primary COC) concentrations have reduced by **96% (was 93%)** (sum of key wells within TD area, excluding 2 wells to SW that increased)
 - Total Molar concentration (sum of CVOCs) has reduced by **93% (was 84%)** (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 area), conducted reinjection of EVO in 2017
 - **Too early to evaluate effect of reinjection on cross-gradient area**

Updates in Green Font

Completed Documents (Historical1)

- 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 Memorandum20

Completed Field Work (Historical1)

- 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 (2nd 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 (4th 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