

**Travis Air Force Base
Environmental Restoration Program
Restoration Program Manager's
Meeting Minutes
16 January, 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 meeting on 16 January 2019 at 0930 hours in Building 248 at Travis AFB, California. Attendees included:

Lonnie Duke	AFCEC/CZOW
Glenn Anderson	AFCEC/CZOW
Gene Clare	AFCEC/CZOW
Angel Santiago Jr.	AFCEC/CZOW
Haekyung Kim	AFCEC/CZRW
(via telephone)	
Merrie Schilter-Lowe	Travis AFB/PA
Ben Fries	DTSC
(via telephone)	
Adriana Constantinescu	RWQCB
(via telephone)	
Sarah Miller	USACE-Omaha
(via telephone)	
Mike Wray	CH2M/JACOBS
Leslie Royer	CH2M/JACOBS
(via telephone)	
Jill Dunphy	CH2M/JACOBS

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 (November 2018)
Attachment 4	CGWTP Monthly Data Sheet (November 2018)
Attachment 5	LF007C Monthly Data Sheet (November 2018)
Attachment 6	ST018 Monthly Data Sheet (November 2018)
Attachment 7	SBBGWTP Monthly Data Sheet (December 2018)
Attachment 8	CGWTP Monthly Data Sheet (December 2018)

Attachment 9	LF007C Monthly Data Sheet (December 2018)
Attachment 10	ST018 Monthly Data Sheet (December 2018)
Attachment 11	Presentation: Work Scheduled to Take Place on Locations with Land Use Controls
Attachment 12	Presentation: Program Update

1. ADMINISTRATIVE

A. Previous Meeting Minutes

There were no Water Board or DTSC comments on the November 2018 RPM Teleconference Summary. EPA was unable to comment due to the ongoing partial federal government shutdown; as such, the November RPM Teleconference Summary will remain draft until the EPA can provide comment.

B. Action Item Review

Action items from November 2018 were reviewed.

Action item 1 is ongoing: Ms. O'Sullivan to provide updates on perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA). January 2019 update: Mr. Duke had no updates. Regarding the Site Inspection Report, Ms. Constantinescu said that the Water Board will send a letter to the Air Force requesting that the Air Force issue a work plan for additional PFOS/PFOA investigation. This request will include a proposed timeline, based on the Water Board's regulatory framework that will be coordinated with the Air Force in advance. Mr. Duke indicated that he does not know what timeframe will be acceptable for that contract, particularly because the expanded site inspections that the other contractor has been conducting are not part of the CERCLA process. Ms. Constantinescu will contact Mr. Duke and Mr. Anderson by 25 January to coordinate a discussion regarding the proposed timeline for collection of additional data. There are no updates regarding state action levels.

Action Item 2 is ongoing: Mr. Duke will continue to provide design and construction information for the new KC-46 Hangar construction project. January 2019 update: Mr. Anderson reviewed the Vapor Intrusion Report that includes the preliminary vapor intrusion (VI) sampling data, which indicate that the VI requirements in the ROD are more than adequate for protection of future occupants of the facility. Ms. Constantinescu said that she received and will review the document. The Water Board will only provide comments if warranted.

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).

Several documents will be affected by the ongoing partial federal government shutdown, and resulting furlough of EPA staff and contractors. In order to maximize forward progress on all documents during the shutdown, the Air Force and all State agencies will continue to submit, review, and provide comments or responses to comments on all documents according to the dates listed on the MMDS, with the understanding that no additional progress can be made on some documents until the EPA returns to work and has an opportunity to review and comment. The goal is to move all documents to the point where all State agency work is completed, and the only delay is due to the shutdown. All dates listed as TBD due to the shutdown will be discussed with the EPA upon their return to work, and a revised MMDS will be sent out to the agencies for review ahead of the RPM meeting that follows.

Travis AFB Annual Meeting and Teleconference Schedule

The next RPM meeting will be a meeting held on Wednesday, 20 February 2019.

Travis AFB Master Document Schedule

- Community Relations Plan Update (CRP): There was no change to the schedule; however, if progress of other higher-priority documents is delayed due to the government shutdown, the Air Force may reinstate work on the CRP.
- Amendment to the NEWIOU Soil ROD for the Travis AFB ERP Sites SS016 and SD033: Response to Comments, Draft Final, and Final due dates were changed to TBD due to the partial government shutdown. Marc Trost of AFLOA retired on 31 December and prepared responses to EPA comments. He was unable to prepare responses to Water Board comments prior to his retirement date; those are now with his temporary replacement. **This is a super critical document** due to site work supporting planned KC-46 hangar construction.
- No Further Action ROD for Old Skeet Range (TS060 MRA) Response to Comments, Draft Final, and Final due dates were changed to TBD due to the partial government shutdown. **This is an important but not critical document.**
- Site SS016 Remedial Design/Remedial Action Work Plan: The Final due date was changed to TBD due to the partial government shutdown. This document won't go final until the draft-final Amendment to the NEWIOU Soil ROD is submitted, which is also delayed due to the shutdown. This excavation project is located within the footprint of the future new KC-46 hangar, so **this document is critical.**
- Site SD031 Soil Remedial Investigation/Feasibility Study: No change was made to the schedule. **This document is important but not time-critical.**
- Fourth Five-Year Review Report for Multiple Groundwater, Soil, and Sediment Sites: No change was made to the schedule. **This document is very important but not critical.**
- Addendum to the Site SS016 Groundwater Remedial Design/Remedial Action Work Plan: The Draft to Agencies and Draft to RAB due dates were changed to 28

January 2019, and the Agency Comments due date was changed to 28 February 2019. The State agencies should adhere to this schedule despite the partial government shutdown. The rest of the schedule was changed to TBD due to the shutdown.

- Potrero Hills Annex (FS, PP, and ROD): No change was made to the schedule.
- Quarterly Newsletters (January 2019): No change was made to the schedule. EPA and DTSC provided comments, the Water Board will not be providing comments.
- 2017 Annual GRISR: The Response to Comments and Final due dates were changed to TBD due to the partial government shutdown. The Air Force is preparing responses to EPA and Water Board comments. DTSC will submit comments by the end of January (note, agency comments were due for this document on 19 November 2018).
- Site SS015 Soil Sampling Results Technical Memorandum. The Response to Comments Meeting, Response to Comments due, and Final due dates were changed to TBD due to the partial government shutdown. DTSC requested that their ecological risk assessment team review the document, but Mr. Duke noted that the agency comment due date has passed. Mr. Duke and Mr. Anderson will send a clarifying email to the DTSC indicating why there are no impacts to ecological receptors.
- Site LF006 Technology Demonstration Construction Completion Report: The PreDraft to AF/Service Center due date was changed to 19 December 2018 based on actual submittal date. The AF Service Center Comments, Draft to Agencies, Draft to RAB, and Agency Comments due dates were changed accordingly. The State agencies should adhere to this schedule despite the partial government shutdown. The rest of the schedule was changed to TBD due to the shutdown.
- Subarea LF007C Total Petroleum Hydrocarbon Chromatogram Review Technical Memorandum: No changes were made to the schedule. The Water Board will provide a response indicating they have no comments on the document by the end of January.
- AOC TA500 POCO Well Decommissioning and Site Closeout Technical Memorandum: The Response to Comment and Final due dates were changed to 8 January 2019 to reflect the actual submittal date.
- Amendment to the WABOU Soil ROD for Travis AFB ERP Sites DP039, SD043, and SS046: Moved to History.
- Site LF006 Technology Demonstration Work Plan: Moved to History.
- Emulsified Vegetable Oil Sites FT004, SS015, SD031, and SD036 Injections Technical Memorandum: Moved to History.

2. CURRENT PROJECTS

Treatment Plant Operation and Maintenance Update

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

The South Base Boundary Groundwater Treatment Plant (SBBGWTP) performed at 100% uptime, and 8.2 million gallons of groundwater were extracted and treated in November 2018. All treated water was discharged to Union Creek. The average flow rate for the SBBGWTP was 151.0 gallons per minute (gpm). Electrical power usage was 21,967 kWh, and approximately 17,056 pounds of CO₂ were created (based on DOE calculation). Approximately 1.8 pounds of volatile organic compounds (VOCs) were removed in November. The total mass of VOCs removed since startup of the system is 509.7 pounds.

Troubleshooting activities were performed on several extraction wells in November 2018. Details can be found in Attachment 3.

No optimization activities are reported for the month of November 2018.

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

The Central Groundwater Treatment Plant (CGWTP) performed at 85.4% uptime with approximately 1,140,310 gallons of groundwater extracted and treated in November 2018. All treated water was discharged to the storm sewer system which discharges to Union Creek. The average flow rate for the CGWTP was 25.9 gpm. Electrical power usage was 2,303 kWh for all equipment connected to the Central Plant, and approximately 2,592 pounds of CO₂ were generated. Approximately 1.9 pounds of VOCs were removed from groundwater by the treatment plant in November. The total mass of VOCs removed since the startup of the system is 11,506 pounds.

In November, the CGWTP operated sporadically because the main system transfer pump was not functioning properly, amounting to approximately 5 days total. The cause of the shutdowns will be investigated in December 2018.

Optimization Activities for CGWTP: The DP039 bioreactor continues to operate in a four-week “pulsed mode.” No other optimization activities are reported for the month of November 2018.

LF007C Groundwater Treatment Plant, November 2018 (See Attachment 5)

The Subarea LF007C Groundwater Treatment Plant (LF007C GWTP) performed at 88.5% uptime with approximately 181,774 gallons of groundwater extracted and treated in November 2018. All treated water was discharged to the Duck Pond for beneficial reuse. The average flow rate was 4.0 gpm. Approximately 1.4×10^{-3} pound of VOCs was removed from groundwater by the treatment plant in November 2018. 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.

An air relief valve was installed to remove air from the process line prior to entering the carbon vessels and system totalizer; therefore, the system totalizers represent a more accurate reading of system flow and total gallons processed. Travis AFB will continue to monitor the three totalizers at the LF007C GWTP for accurate reporting.

The system was temporarily shut down in anticipation of a heavy storm in November; however, no standing water had accumulated, and the system was restarted without issue.

No optimization activities are reported for the month of November 2018.

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

Site ST018 (MTBE) Treatment Plant (ST018 GWTP) performed at 100% uptime with approximately 138,220 gallons of groundwater extracted in November 2018. All groundwater was discharged to the Fairfield – Suisun Sewer District. The average flow rate for the ST018 GWTP was 2.7 gpm. Electrical power usage for the month was 73 kWh for all equipment connected to the ST018 GWTP. The total CO₂ equivalent, including an estimate for the carbon change-out, equates to approximately 54 pounds. Approximately 0.13 pound of MTBE, BTEX, VOCs, and TPH was removed in November by the treatment plant, and approximately 0.07 pound of MTBE-only was removed from groundwater. The total BTEX, MTBE and TPH mass removed since the startup of the system is 46.0 pounds, and the total MTBE mass removed since startup of the system is 11.2 pounds.

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

On 9 November, EW2014x18 was shut down, because the pump and piping were severely fouled. The pump was removed, cleaned, and re-installed, and the extraction well was restarted without issue.

No optimization activities are reported for the month of November 2018.

South Base Boundary Groundwater Treatment Plant, December 2018 (see Attachment 7)

The South Base Boundary Groundwater Treatment Plant (SBBGWTP) performed at 100% uptime, and 5.4 million gallons of groundwater were extracted and treated in December 2018. All treated water was discharged to Union Creek. The average flow rate for the SBBGWTP was 144.0 gallons per minute (gpm). Electrical power usage was 14,215 kWh, and approximately 11,319 pounds of CO₂ were created (based on DOE calculation). Approximately 1.0 pound of volatile organic compounds (VOCs) were removed in December. The total mass of VOCs removed since startup of the system is 510.7 pounds.

Troubleshooting activities were performed on several extraction wells in December 2018. Details can be found in Attachment 7.

No optimization activities are reported for the month of December 2018.

Central Groundwater Treatment Plant, December 2018 (see Attachment 8)

The Central Groundwater Treatment Plant (CGWTP) performed at 99.7% uptime with approximately 1,029,960 gallons of groundwater extracted and treated in December 2018. All treated water was discharged to the storm sewer system which discharges to Union Creek. The average flow rate for the CGWTP was 26.5 gpm. Electrical power usage was 2,396 kWh for all equipment connected to the Central Plant, and approximately 2,661 pounds of CO₂ were generated. Approximately 1.9 pounds of VOCs were removed from groundwater by the treatment plant in December. The total mass of VOCs removed since the startup of the system is 11,508 pounds.

On 10 December, two extraction wells were offline because the pump utility vault had flooded with rain. The water was drained and both pumps were brought back online. The system was shut down on 12 December to remove a piece of plastic that was obstructing the inlet to the pump, and a cracked check valve was replaced.

Optimization Activities for CGWTP: The DP039 bioreactor continues to operate in a four-week “pulsed mode.” No other optimization activities are reported for the month of December 2018.

LF007C Groundwater Treatment Plant, December 2018 (See Attachment 9)

The Subarea LF007C Groundwater Treatment Plant (LF007C GWTP) performed at 100% uptime with approximately 123,870 gallons of groundwater extracted and treated in December 2018. All treated water was discharged to the Duck Pond for beneficial reuse. The average flow rate was 3.3 gpm. Approximately 1.5×10^{-3} pound of VOCs

was removed from groundwater by the treatment plant in December 2018. 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 December 2018.

ST018 Groundwater (MTBE) Treatment Plant, December 2018 (see Attachment 10)

Site ST018 (MTBE) Treatment Plant (ST018 GWTP) performed at 100% uptime with approximately 129,910 gallons of groundwater extracted in December 2018. All groundwater was discharged to the Fairfield – Suisun Sewer District. The average flow rate for the ST018 GWTP was 3.4 gpm. Electrical power usage for the month was 69 kWh for all equipment connected to the ST018 GWTP. The total CO₂ equivalent, including an estimate for the carbon change-out, equates to approximately 51 pounds. Approximately 0.14 pound of MTBE, BTEX, VOCs, and TPH was removed in December by the treatment plant, and approximately 0.05 pound of MTBE-only was removed from groundwater. The total BTEX, MTBE and TPH mass removed since the startup of the system is 46.1 pounds, and the total MTBE mass removed since startup of the system is 11.3 pounds.

Note: Electrical power use at the ST018 GWTP is only for the alarm system and a pump that pushes water influent tank 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 December 2018.

3. Presentations:

A) Work Scheduled to Take Place on Locations with Land Use Controls (see Attachment 11)

Mr. Duke discussed the various upcoming projects that are planned to be built on areas that currently have land use controls in place:

- KC-46 Hangar: No additional details; current status covered in Action Item 2
- Concrete Batch Plant at Site LF044:
 - Approximately 8 years ago, the surface soil including some construction debris was scraped down to native soil prior to construction of the three large Kinder-Morgan tanks. The soil was sent to an appropriate landfill. Confirmation samples were collected to verify that all CERCLA contaminants had been removed from the footprint of the fuel tank construction area.

- Similarly, the base requires a small eastern portion of LF044 along with an area to the west of Site DP039 to build a concrete batch facility.
 - This area will remain an industrial area while the concrete batch plant is in operation; which is expected to last for 15 years. This concrete is to be used for flightline repairs and upgrades. This location was chosen as it will not interfere with other base operations. A berm from a former missile facility building will be removed as part of the batch plant construction.
 - Ms. Constantinescu requested that the Water Board review the stormwater management plan. Mr. Duke replied that a thorough Environmental Assessment (EA) had been completed, and it included stormwater management. Mr. Duke will provide an electronic copy of the EA to the Water Board.
- CalWater Siting at Site DP039:
 - Similar to City Light and Power contract; CalWater was awarded a 50-year contract on-base.
 - CalWater needs an area to stage equipment and conduct work as they set up a more permanent facility; will be at the corner of Ellis Drive and Dixon, on very edge of 5 ug/L DP039 plume (cross-gradient)
 - Temporary facilities will be in trailers, elevated 3 to 4 feet from the ground. The separation from the ground plus low TCE concentrations in the plume, do not present a vapor intrusion issue.
 - If permanent facilities are constructed, the concentrations will be evaluated ahead of construction to determine if any additional safeguards are required for the design of the buildings.
- New Cargo Facility at Building 977, Site SD037:
 - Large pallets of materials get loaded onto aircraft at this facility, and they can raise and lower the pallets using hydraulic rams.
 - Samples were collected in the 1980s as a response to leaks of hydraulic fluid. TPH was detected in two locations. No specific coordinates, but there is a good general idea where these samples were collected.
 - The pallet racking area just north of Area G will be demolished, the area will be regraded, and a new cargo handling facility will be built.
 - Surface prep/soil removal will be conducted as part of this renovation; samples will be collected and evaluated for proper disposal of collected soil.
- TerraDex alerts may be generated as these projects move forward.

B) Program Update: Activities Completed, In Progress, and Upcoming (see Attachment 12)

Mr. Wray reported on the status of fieldwork and documents which are completed, in progress, and upcoming. Please refer to Attachment 12 for the full briefing.

4. New Action Item Review

1. Once the partial government shutdown is over and the EPA returns to work, the Air Force will discuss the document schedule with the EPA and revise the Master Meeting and Document Schedule accordingly. Mr. Duke will send the revised MMDS to the regulators ahead of the meeting or teleconference following the reopening of the federal government.
2. Mr. Anderson will send a summary email to DTSC regarding acceptable ecological risk at Site SS015 due to a thick overlying concrete pavement, justifying that there is no need for DTSC's ecological risk assessor to review the documents.
3. Mr. Duke will upload the Environmental Assessment from the Concrete Batch Plant for Water Board review of the stormwater management section.
4. Mr. Anderson will send an Outlook invitation to the regulators for the annual LUC inspection, tentatively planned for 29 January 2019.

5. PROGRAM ISSUES/UPDATE

The EPA and EPA contractors are currently furloughed as a result of the ongoing partial federal government shutdown. In order to maximize forward progress on all documents during the shutdown, the Air Force and all State agencies will continue to submit, review, and provide comments or responses to comments on all documents according to the dates listed on the MMDS, with the understanding that no additional progress can be made on some documents until the EPA returns to work and has an opportunity to review and comment. The goal is to move all documents to the point where all State agency work is completed, and the only delay is due to the shutdown. All dates listed as TBD due to the shutdown will be discussed with the EPA upon their return to work, and a revised MMDS will be sent out to the agencies for review ahead of the RPM meeting that follows.

6. Action Items

Item #	Responsible	Action Item Description	Due Date	Status
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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 design and construction information for the KC-46 Hangar for agency input ahead of the Air Force/Civil Engineering awarding the construction contract.	Ongoing	Open
3.	Lonnie Duke	Once the partial government shutdown is over and the EPA returns to work, the Air Force will discuss the document schedule with the EPA and revise the Master Meeting and Document Schedule accordingly. Mr. Duke will send the revised MMDS to the regulators ahead of the meeting or teleconference following the reopening of the federal government.	Ongoing	Open
4.	Glenn Anderson	Mr. Anderson will send a summary email to DTSC regarding acceptable ecological risk at Site SS015 due to thick concrete, justifying that there is no need for DTSC/HERO's ecological risk assessor to review the documents.	18 January 2019	
5.	Lonnie Duke	Mr. Duke will provide the Environmental Assessment from the Concrete Batch Plant for Water Board review of the stormwater management section.	18 January 2019	
6.	Glenn Anderson	Mr. Anderson will send an Outlook invitation to the regulators for the annual LUC inspection, tentatively planned for 29 January 2019.	18 January 2019	

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

The RPM Teleconference is scheduled for 9:30 AM PST on 16 January 2019. **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

- A. TREATMENT PLANT OPERATION AND MAINTENANCE UPDATE

3. PRESENTATIONS

- A. UPCOMING PROJECTS ON LUC SITES
- B. PROGRAM UPDATE:
DOCUMENTS & ACTIVITIES COMPLETED, IN PROGRESS AND PLANNED

4. NEW ACTION ITEM REVIEW

5. PROGRAM/ISSUES/UPDATE

- A. MEETING SCHEDULE

NOTES: AFTER THE RPM TELECONFERENCE, 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.

(2019)
Annual Meeting and Teleconference Schedule

Monthly RPM Meeting¹ (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.)
—	01-16-19	—
02-20-19	—	—
—	03-20-19	—
04-18-19 (Thursday 2:00 PM)	—	04-18-19
—	05-15-19	—
06-19-19	—	—
—	07-17-19	—
08-21-19	—	—
—	09-18-19	—
10-16-19	—	May through October ²
—	11-20-19	—
—	—	—

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 NEWIOU Soil ROD for the Travis AFB ERP Sites SS016 and SD033 Travis AFB, Glenn Anderson CH2M, Latonya Coleman	No Further Action ROD for Old Skeet Range (TS060 MRA) Travis AFB, Glenn Anderson
Scoping Meeting	NA	NA	NA
Predraft to AF/Service Center	08-23-16	02-28-18	05-18-18
AF/Service Center Comments Due	09-07-16	03-30-18	06-01-18
Draft to Agencies	09-28-16 (03-22-18)	06-22-18	6-25-18
Draft to RAB	09-28-16 (03-22-18)	06-22-18	6-25-18
Agency Comments Due	10-28-16 (04-27-18)	08-22-18	11-30-18
Response to Comments Meeting	TBD	09-06-18	01-16-19
Agency Concurrence with Remedy	NA	NA	NA
Public Comment Period	NA	NA	NA
Public Meeting	NA	NA	NA
Response to Comments Due	TBD	TBD*	TBD*
Draft Final Due	TBD	TBD*	TBD*
Final Due	TBD	TBD*	TBD*

* = TBD due to government shutdown.

Travis AFB Master Meeting and Document Schedule

PRIMARY DOCUMENTS		
Life Cycle	Site SS016 Remedial Design/Remedial Action Work Plan Travis AFB, Glenn Anderson CH2M, Doug Berwick CAPE, Meg Greenwald	Site SD031 Soil Remedial Investigation/Feasibility Study Travis AFB, Glenn Anderson CH2M, Nikki Carlton
Scoping Meeting	NA	NA
Predraft to AF/Service Center	06-04-18	TBD
AF/Service Center Comments Due	06-18-18	TBD
Draft to Agencies	07-31-18	TBD
Draft to RAB	07-31-18	TBD
Agency Comments Due	08-30-18	TBD
Response to Comments Meeting	09-19-18	TBD
Agency Concurrence with Remedy	NA	NA
Public Comment Period	NA	NA
Public Meeting	NA	NA
Response to Comments Due	10-24-18	TBD
Draft Final Due	10-24-18	TBD
Final Due	TBD	TBD

Travis AFB Master Meeting and Document Schedule

PRIMARY DOCUMENTS		
Life Cycle	Fourth Five-Year Review Report for Multiple Groundwater, Soil, and Sediment Sites Travis AFB, Glenn Anderson Tetra Tech, Joachim Eberharter	Addendum to the Site SS016 Groundwater Remedial Design/Remedial Action Work Plan Travis AFB, Lonnie Duke CH2M, Levi Pratt
Scoping Meeting	NA	NA
Predraft to AF/Service Center	03-14-18	12-12-18
AF/Service Center Comments Due	05-22-18	01-02-19
Draft to Agencies	06-05-18	01-28-19**
Draft to RAB	06-05-18	01-28-19**
Agency Comments Due	07-20-18	02-28-19**
Response to Comments Meeting	TBD	TBD*
Agency Concurrence with Remedy	NA	NA
Public Comment Period	NA	NA
Public Meeting	NA	NA
Response to Comments Due	TBD	TBD*
Draft Final Due	TBD	TBD*
Final Due	TBD	TBD*

* = TBD due to government shutdown.

* * = Submit to Water Board and DTSC, but hold for EPA, until they return from the government shutdown.

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

INFORMATIONAL DOCUMENTS		
Life Cycle	Quarterly Newsletter (January 2019) Travis, Glenn Anderson	2017 Annual GRISR Travis AFB, Glenn Anderson CH2M, Leslie Royer
Scoping Meeting	NA	NA
Predraft to AF/Service Center	12-27-18	05-09-18
AF/Service Center Comments Due	NA	06-11-18
Draft to Agencies	01-02-19	07-19-18
Draft to RAB	NA	07-19-18
Agency Comments Due	01-16-19	11-19-18
Response to Comments Meeting	01-23-19	01-16-19
Response to Comments Due	01-25-19	TBD*
Draft Final Due	NA	NA
Final Due	01-25-19	TBD*
Public Comment Period	NA	NA
Public Meeting	NA	NA

* = TBD due to government shutdown.

Travis AFB Master Meeting and Document Schedule

INFORMATIONAL DOCUMENTS		
Life Cycle	Site SS015 Soil Sampling Results Technical Memorandum Travis AFB, Glenn Anderson CH2M HILL, Levi Pratt	Site LF006 Technology Demonstration Construction Completion Report Travis AFB, Glenn Anderson CH2M HILL, Levi Pratt
Scoping Meeting	NA	NA
Predraft to AF/Service Center	10-17-18	12-19-18
AF/Service Center Comments Due	10-31-18	01-09-19
Draft to Agencies	11-20-18	01-24-19**
Draft to RAB	11-20-18	01-24-19**
Agency Comments Due	12-21-18	02-25-19**
Response to Comments Meeting	TBD*	TBD*
Response to Comments Due	TBD*	TBD*
Draft Final Due	NA	NA
Final Due	TBD*	TBD*
Public Comment Period	NA	NA
Public Meeting	NA	NA

* = TBD due to government shutdown.

* * = Submit to Water Board and DTSC, but hold for EPA, until they return from the government shutdown.

Travis AFB Master Meeting and Document Schedule

INFORMATIONAL DOCUMENTS		
Life Cycle	Subarea LF007C Total Petroleum Hydrocarbon Chromatogram Review Technical Memorandum Travis AFB, Glenn Anderson CH2M HILL, Leslie Royer	AOC TA500 Well Decommissioning and Site Closeout Technical Memorandum Travis AFB, Glenn Anderson CH2M HILL, Tony Chakurian
Scoping Meeting	NA	NA
Predraft to AF/Service Center	09-05-18	10-15-18
AF/Service Center Comments Due	09-19-18	10-29-18
Draft to Agencies	09-24-18	11-12-18
Draft to RAB	09-24-18	11-12-18
Agency Comments Due	10-24-18 (12-19-18)	12-14-18
Response to Comments Meeting	01-16-19	01-16-19
Response to Comments Due	02-06-19	02-01-19 (01-08-19)
Draft Final Due	NA	NA
Final Due	02-06-19	02-01-19 (01-08-19)
Public Comment Period	NA	NA
Public Meeting	NA	NA

Travis AFB Master Meeting and Document Schedule

HISTORY - PRIMARY DOCUMENTS	
Life Cycle	Amendment to the WABOU Soil ROD for the Travis AFB ERP Sites DP039, SD043, and SS046 Travis AFB, Glenn Anderson CH2M, Latonya Coleman
Scoping Meeting	NA
Predraft to AF/Service Center	10-09-17
AF/Service Center Comments Due	11-08-17
Draft to Agencies	11-30-17
Draft to RAB	11-30-17
Agency Comments Due	01-31-18
Response to Comments Meeting	02-21-18
Agency Concurrence with Remedy	NA
Public Comment Period	NA
Public Meeting	NA
Response to Comments Due	08-17-18
Draft Final Due	08-17-18
Final Due	09-17-18 (10-30-18)

Travis AFB Master Meeting and Document Schedule

HISTORY - SECONDARY AND INFORMATIONAL DOCUMENTS		
Life Cycle	Site LF006 Technology Demonstration Work Plan Travis AFB, Glenn Anderson CH2M, Levi Pratt	Emulsified Vegetable Oil Sites FT004, SS015, SD031, and SD036 Injections Technical Memorandum Travis AFB, Gene Clare CH2M, Levi Pratt
Scoping Meeting	NA	NA
Predraft to AF/Service Center	07-03-18	06-12-18
AF/Service Center Comments Due	07-18-18	06-26-18
Draft to Agencies	08-20-18	08-31-18
Draft to RAB	08-20-18	08-31-18
Agency Comments Due	09-20-18 (10-04-18)	10-01-18
Response to Comments Meeting	10-17-18	10-18-18
Response to Comments Due	10-31-18 (10-22-18)	11-01-18 (11-06-18)
Draft Final Due	NA	NA
Final Due	10-31-18 (10-22-18)	11-01-18 (11-06-18)
Public Comment Period	NA	NA
Public Meeting	NA	NA

South Base Boundary Groundwater Treatment Plant

Monthly Data Sheet

Report Number: 217

Reporting Period: 31 October 2018 – 7 December 2018

Date Submitted: 17 December 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 November 2018 reporting period.

Table 1 – Operations Summary – November 2018				
Initial Data Collection:		10/31/2018 9:00	Final Data Collection:	12/7/2018 12:50
Operating Time:		Percent Uptime:	Electrical Power Usage:	
SBBGWTP:	892 hours	SBBGWTP:	100%	SBBGWTP: 21,967 kWh (17,056 lbs CO ₂ generated ^a)
Gallons Treated: 8.2 million gallons			Gallons Treated Since July 1998: 1,083 million gallons	
Volume Discharged to Union Creek: 8.2 million gallons			Gallons Treated from Other Sources: 0 gallons	
VOC Mass Removed: 1.8 lbs^b			VOC Mass Removed Since July 1998: 509.7 lbs	
Rolling 12-Month Cost per Pound of Mass Removed: \$11,420 ^c				
Monthly Cost per Pound of Mass Removed: \$8,935 ^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 November 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 – November 2018							
FT005 ^b				SS029		SS030	
EW01x05	Offline	EW743x05	Offline	EW01x29	Offline ^c	EW01x30	7.1
EW02x05	Offline	EW744x05	3.6	EW02x29	Offline ^c	EW02x30	3.5
EW03x05	Offline	EW745x05	7.9	EW03x29	3.8	EW03x30	14.9
EW731x05	6.9	EW746x05	Offline	EW04x29	8.2	EW04x30	23.3
EW732x05	Offline	EW2291x05	3.6	EW05x29	7.7	EW05x30	11.9
EW733x05	Offline	EW2782x05	6.0	EW06x29	8.1	EW2174x30	7.2
EW734x05	4.8	EW2783x05	9.0	EW07x29	12.5	EW711x30	3.7
EW735x05	11.7	EW2784x05	9.5			MW269x30	Offline ^d
EW736x05	Offline	EW2785x05	4.0				
EW737x05	Offline	EW2786x05	17.6				
EW742x05	Offline						
FT005 Total: 84.6				SS029 Total: 40.3		SS030 Total: 71.6	
SBBGWTP Average Monthly Flow ^e : 151.0 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 Well is dry. If water recharges, the extraction well will be restarted.							
^e 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	None.	--		--	
-- = 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 6 November 2018. Sample results are presented in Table 4. The total VOC concentration (26.6 µg/L) in the influent sample decreased from the October 2018 sample results (42.8 µg/L). TCE was the primary VOC detected in the influent sample at a concentration of 25 µg/L. TCE, cis-1,2-DCE, chloroform, and 1,2-DCA were detected in the midpoint sampling location at low concentrations. No VOCs were detected in the final effluent sample; however, TPH-d (42 J µg/L) was detected at a concentration less than the effluent limitation of 50 µg/L.

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

- EW04x29 – Replaced variable frequency drive. Well is currently operating.
- EW02x30 – Replaced damaged electrical wire. Replaced pressure transducer. Well is currently operating.
- EW711x30 – Replaced damaged electrical wire. Replaced pump and motor. Well is currently operating.
- EW2783x05 – Cleaned totalizer. Well is currently on line.
- EW2784x05 – Cleaned wires for totalizer. Well is currently on line.

In November while inspecting the electrical wires for SS030 extraction wells, all SS030 wells were temporarily shut down.

Figure 1 presents the influent 1,2-DCA and TCE concentrations since January 2017. Since July 2018, TCE influent concentrations have increased slightly, while the 1,2-DCA influent concentrations have decreased to non-detect.

Figure 2 presents a plot of influent VOC concentrations and average flow at the SBBGWTP over the past twelve (12) months. An overall increasing trend was observed for the VOC influent concentrations in the past 12 months. An overall steady flow rate trend was observed in the past 12 months.

Optimization Activities

No optimization activities occurred at the SBBGWTP in November 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 3 presents the historical GHG production from the SBBGWTP. In November 2018, the SBBGWTP produced approximately 17,056 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 November 2018 – South Base Boundary Groundwater Treatment Plant

Constituent	Instantaneous Maximum* (µg/L)	Detection Limit (µg/L)	N/C	6 November 2018 (µg/L)		
				Influent	Midpoint	Effluent
Halogenated Volatile Organics						
Acetone	NA	1.9	0	ND	ND	ND
Bromodichloromethane	NA	0.17	0	ND	ND	ND
Carbon Tetrachloride	0.5	0.19	0	ND	ND	ND
Chloroform	5.0	0.16	0	ND	0.21 J	ND
Chloromethane	NA	0.30	0	ND	ND	ND
1,1-Dichloroethane	5.0	0.16	0	ND	ND	ND
1,2-Dichloroethane	0.5	0.13	0	ND	0.64 J	ND
1,1-Dichloroethene	5.0	0.14	0	ND	ND	ND
cis-1,2-Dichloroethene	5.0	0.15	0	1.6	1.4	ND
trans-1,2-Dichloroethene	5.0	0.15	0	ND	ND	ND
Methylene Chloride	5.0	0.32	0	ND	ND	ND
Tetrachloroethene	5.0	0.20	0	ND	ND	ND
1,1,1-Trichloroethane	5.0	0.16	0	ND	ND	ND
1,1,2-Trichloroethane	5.0	0.32	0	ND	ND	ND
Trichloroethene	5.0	0.16	0	25	0.64 J	ND
Vinyl Chloride	0.5	0.10	0	ND	ND	ND
Non-Halogenated Volatile Organics						
Benzene	1.0	0.16	0	ND	ND	ND
Ethylbenzene	5.0	0.16	0	ND	ND	ND
Toluene	5.0	0.17	0	ND	ND	ND
Xylenes	5.0	0.19 – 0.34	0	ND	ND	ND
Other						
Total Petroleum Hydrocarbons – Gasoline	50	10	0	NM	NM	ND
Total Petroleum Hydrocarbons – Diesel	50	16	0	NM	NM	42 J
Total Petroleum Hydrocarbons – Motor Oil	50	160	0	NM	NM	ND

* In accordance with current National Pollutant Discharge Elimination System permit – Interim, effective January 2019.

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 Influent 1,2-DCA and TCE Concentrations Since January 2017

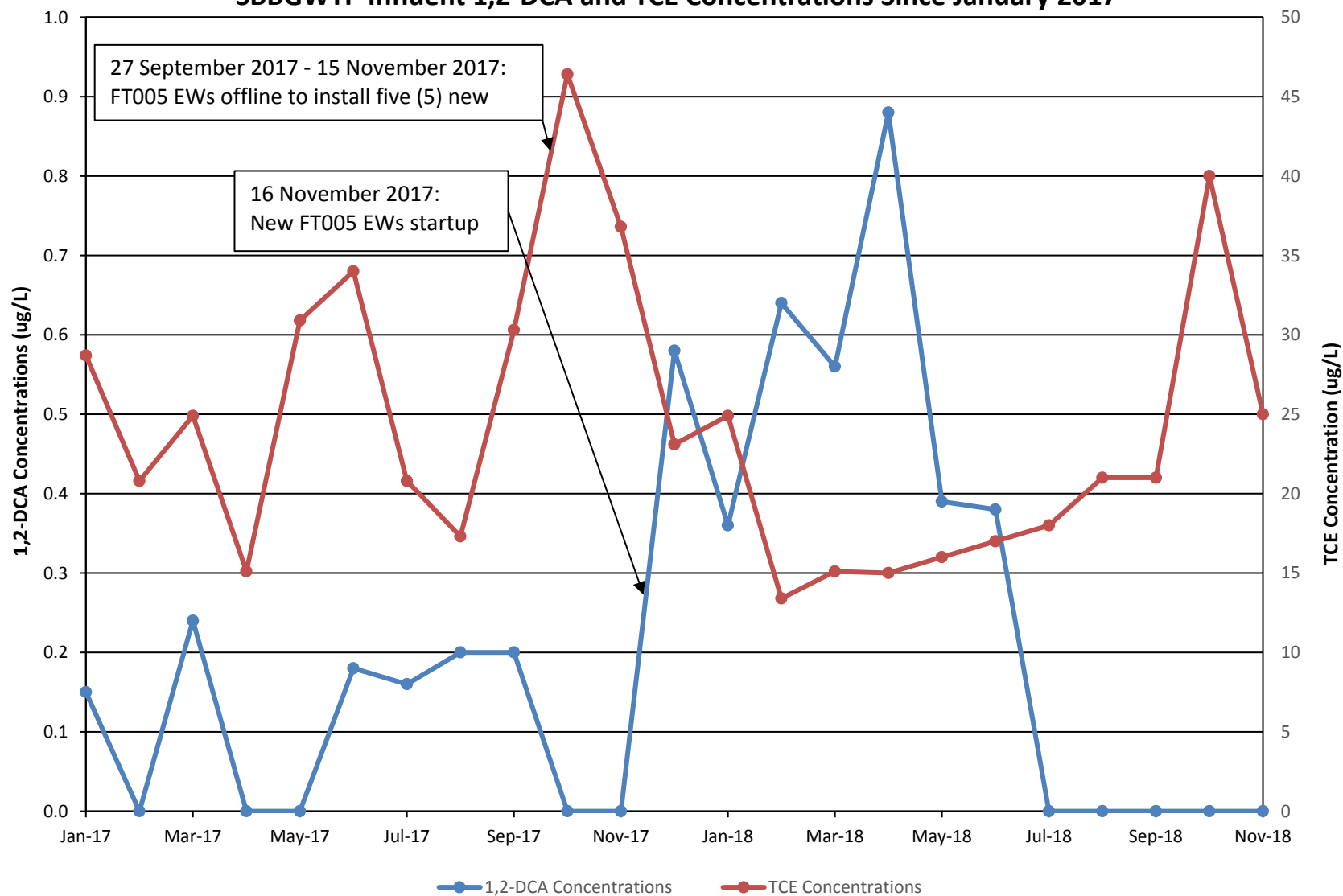


Figure 2
SBBGWTP Total VOC Influent Concentrations and Average Flowrate Twelve Month History

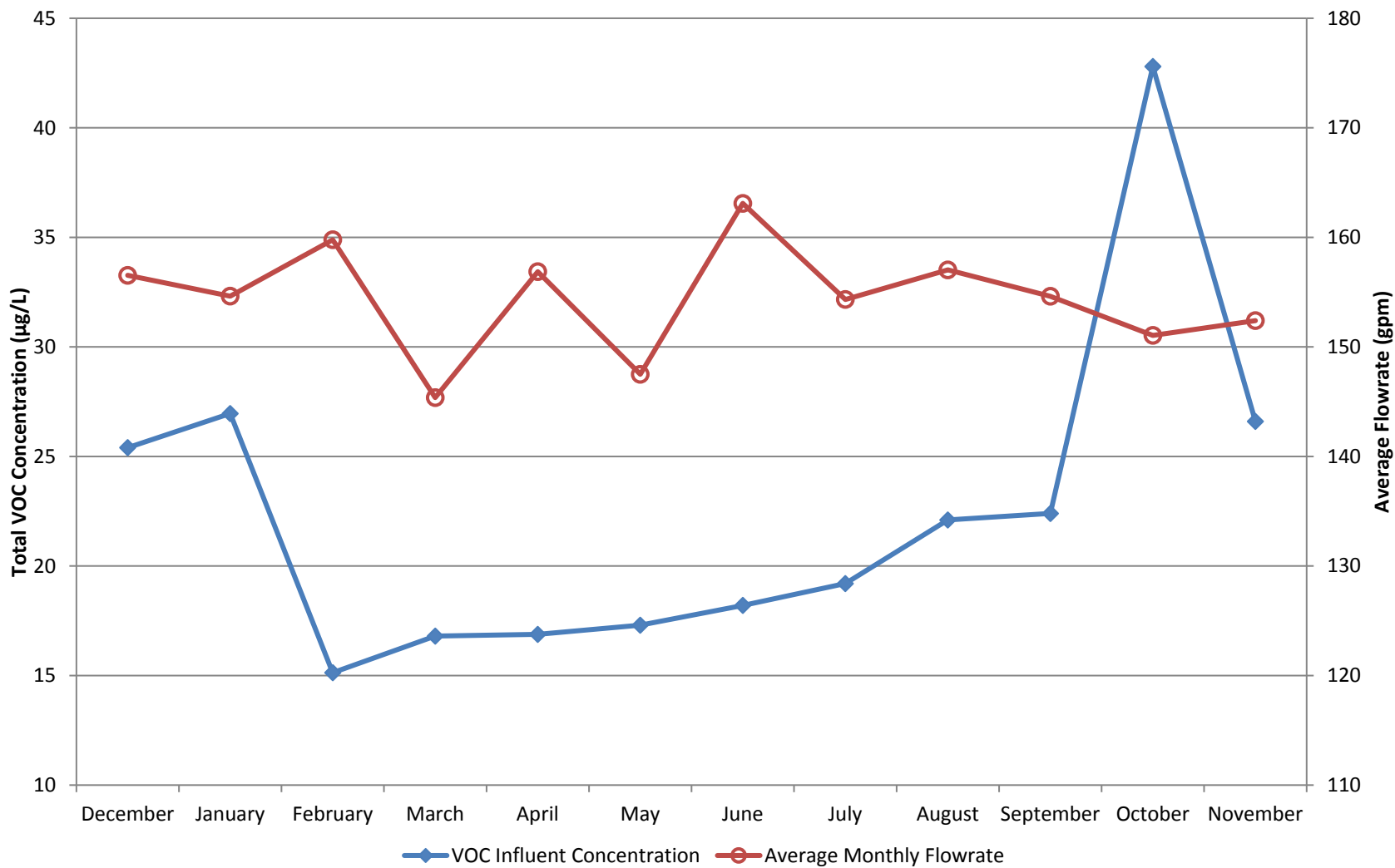
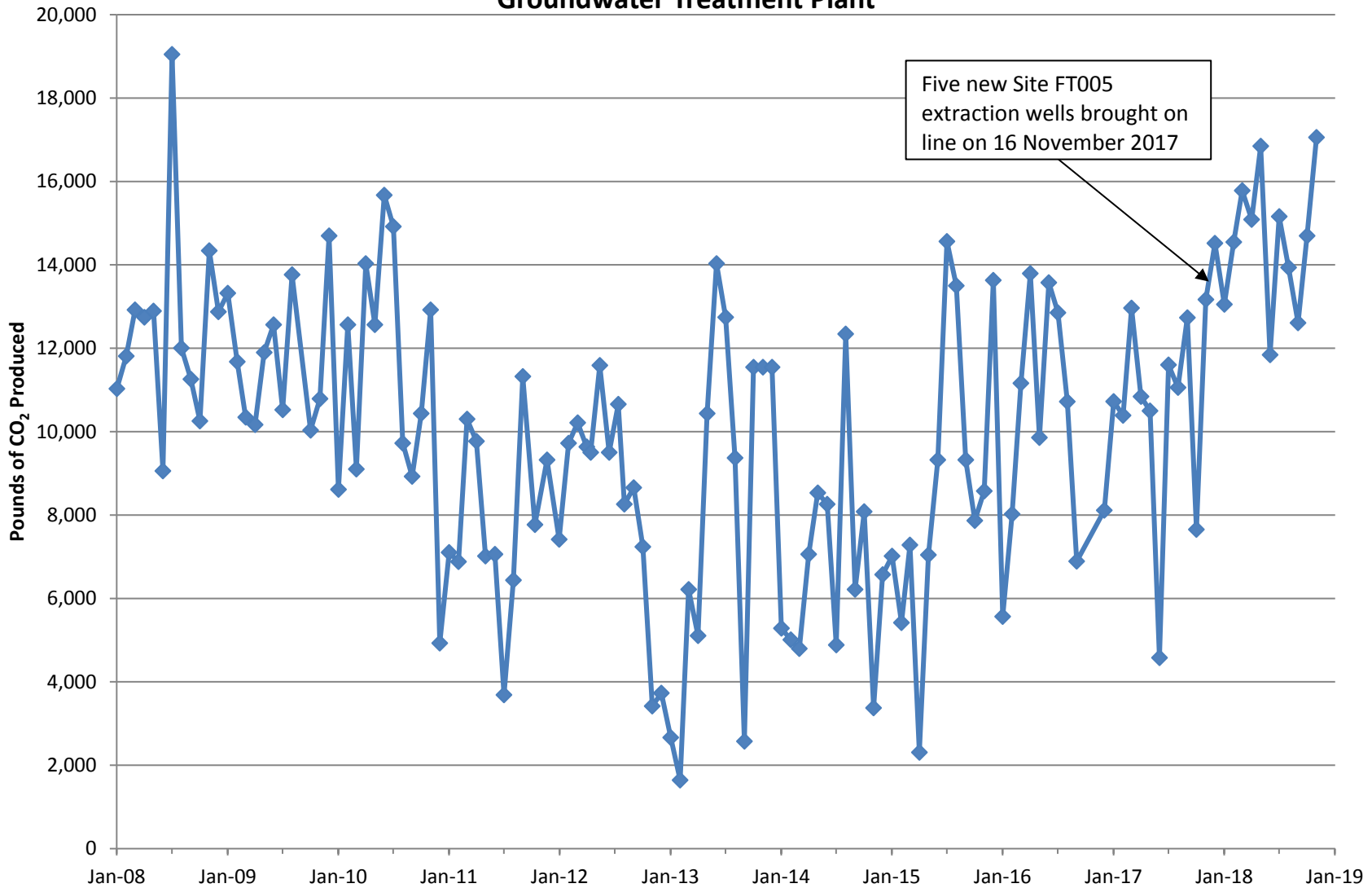


Figure 3

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



Central Groundwater Treatment Plant Monthly Data Sheet

Report Number: 232

Reporting Period: 1 November 2018 – 7 December 2018

Date Submitted: 17 December 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 November 2018 reporting period.

Table 1 – Operations Summary – November 2018				
Initial Data Collection:		11/1/2018 12:30	Final Data Collection:	12/7/2018 9:20
Operating Time:		Percent Uptime:		Electrical Power Usage:
CGWTP:	733 hours	CGWTP:	85.4%	CGWTP: 2,303 kWh (2,592 lbs CO ₂ generated ^a)
Gallons Treated (discharge to storm sewer): 1,140,310 gallons^b		Gallons Treated Since January 1996: 562.8 million gallons		
VOC Mass Removed from groundwater: 1.9 lbs^c		VOC Mass Removed Since January 1996: 2,820 lbs from groundwater 8,686 lbs from vapor		
Rolling 12-Month Cost per Pound of Mass Removed: \$3,429 ^d				
Monthly Cost per Pound of Mass Removed: \$4,473 ^d				
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 Includes approximately 100 gallons of purge water from GRIP sampling.				
c Calculated using November 2018 EPA Method SW8260C analytical results.				
d 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 ^a – November 2018	
Location	Average Flow Rate Groundwater (gpm)
EW001x16	11.9
EW002x16	6.8
EW003x16	0.2
EW605x16	5.5
EW610x16	2.5
CGWTP	25.9
^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	1 November 2018	--	7 December 2018	--	Influent pump P-301 was sporadically off line throughout the month.
-- = 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	6 November 2017	27 November 2017
	26 December 2017	22 January 2018
	19 February 2018	21 March 2018
	16 April 2018	14 May 2018
	12 June 2018	9 July 2018
	7 August 2018	6 September 2018
	1 October 2018	30 October 2018
	27 November 2018	
MW = Monitoring Well		

Summary of O&M Activities

Monthly groundwater treatment samples were collected at the CGWTP on 6 November 2018. Sample results are presented in Table 5. The total VOC concentration (194.81 µg/L) in the November 2018 influent sample has decreased from the October 2018 sample (202.49 µg/L). TCE was the primary VOC detected in the influent sample at a concentration of 150 J µg/L. Vinyl chloride (0.21 J µg/L) was detected at a trace concentration in the sample after the first carbon vessel. No VOCs were detected in the sample collected after the second carbon vessel. No VOCs were detected in the effluent sample location; however, TPH-d (18 J µg/L) was detected at a concentration less than the effluent limitation of 50 µg/L. Travis AFB will continue to monitor influent, midpoint, and effluent concentrations at the CGWTP for carbon breakthrough, though the carbon treatment remained effective in November 2018.

In November, the CGWTP operated sporadically because the main system transfer pump was not functioning properly. The system experienced extended periods of low or no flow, which led to reduced flow from each extraction well, or in some cases system shutdown. In total during November, these downtimes amounted to approximately five (5) days. The cause of the shut downs will be investigated in December 2018. The issues with the influent pump were the cause of the decreased overall flow rate through the system in November.

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 a decreasing trend for the flow rate through the treatment plant.

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 brought on line on 27 November 2018.

Optimization Activities

No optimization activities occurred at the CGWTP in November 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 2,592 pounds of GHG during November 2018.

TABLE 5

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

					6 November 2018 (µg/L)		
Constituent	Instantaneous Maximum* (µg/L)	Detection Limit (µg/L)	N/C	Influent	After Carbon 1 Effluent	After Carbon 2 Effluent	System Effluent
Halogenated Volatile Organics							
Acetone	NA	1.8	0	ND	ND	ND	ND
Chloroform	5.0	0.16	0	ND	ND	ND	ND
Chloromethane	NA	0.30	0	ND	ND	ND	ND
1,2-Dichlorobenzene	5.0	0.13	0	0.42 J	ND	ND	ND
1,3-Dichlorobenzene	5.0	0.16	0	0.47 J	ND	ND	ND
1,4-Dichlorobenzene	5.0	0.16	0	0.21 J	ND	ND	ND
1,1-Dichloroethane	5.0	0.16	0	ND	ND	ND	ND
1,2-Dichloroethane	0.5	0.13	0	ND	ND	ND	ND
1,1-Dichloroethene	5.0	0.14	0	0.50 J	ND	ND	ND
cis-1,2-Dichloroethene	5.0	0.15	0	40	ND	ND	ND
trans-1,2-Dichloroethene	5.0	0.15	0	2.4	ND	ND	ND
Methylene Chloride	5.0	0.32	0	ND	ND	ND	ND
Tetrachloroethene	5.0	0.20	0	0.50 J	ND	ND	ND
1,2,3-Trichlorobenzene	5.0	0.18	0	ND	ND	ND	ND
1,1,1-Trichloroethane	5.0	0.16	0	ND	ND	ND	ND
1,1,2-Trichloroethane	5.0	0.32	0	ND	ND	ND	ND
Trichloroethene	5.0	0.16	0	150 J	ND	ND	ND
Vinyl Chloride	0.5	0.10	0	0.31 J	0.21 J	ND	ND
Non-Halogenated Volatile Organics							
Benzene	1.0	0.16	0	ND	ND	ND	ND
Ethylbenzene	5.0	0.16	0	ND	ND	ND	ND
Toluene	5.0	0.17	0	ND	ND	ND	ND
Total Xylenes	5.0	0.19 – 0.34	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	15	0	NM	NM	NM	18 J
Total Petroleum Hydrocarbons – Motor Oil (C28 – C40)	50 (trigger)	160	0	NM	NM	NM	ND

* In accordance with current National Pollutant Discharge Elimination System permit – January 2018.

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

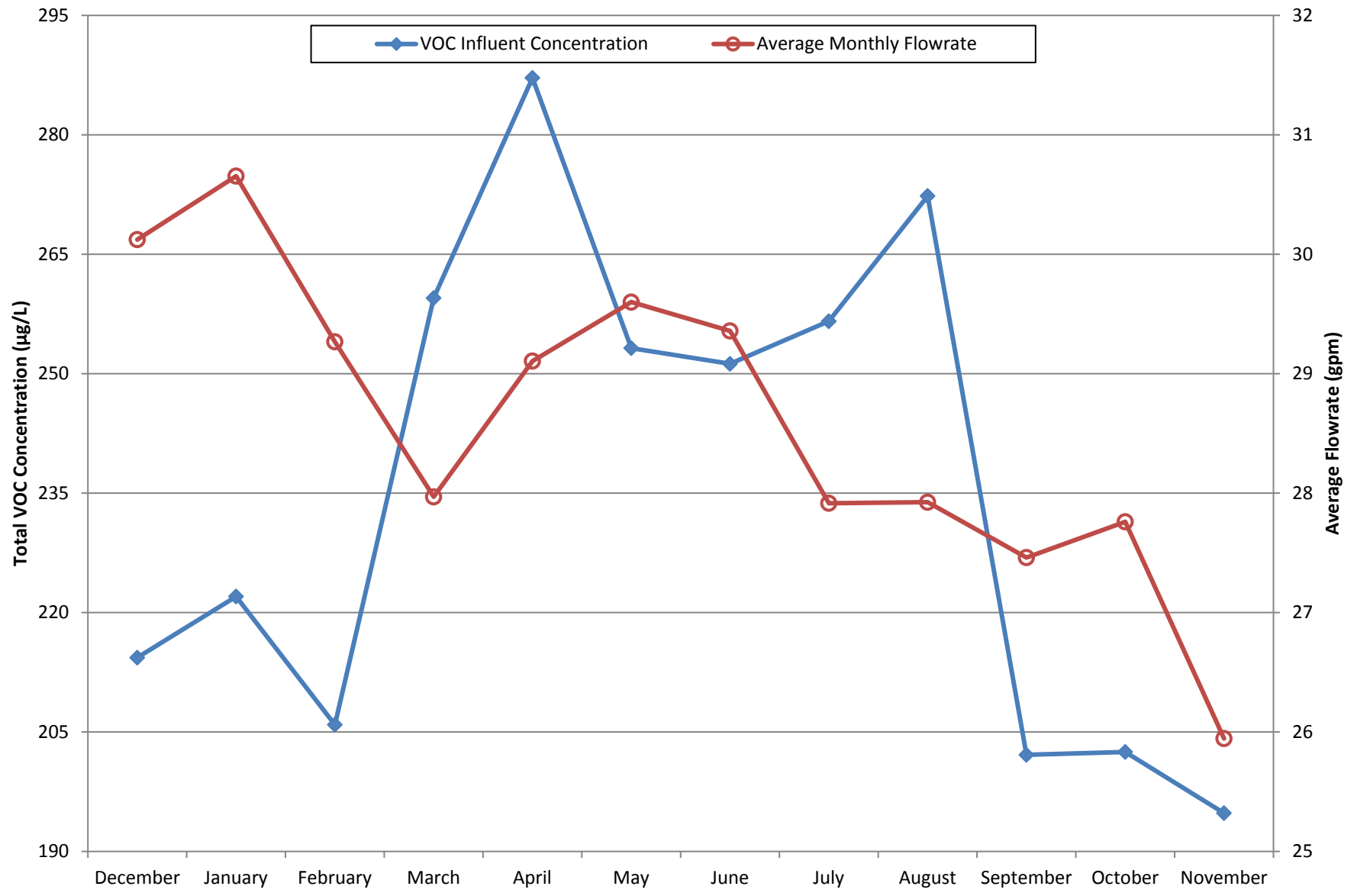
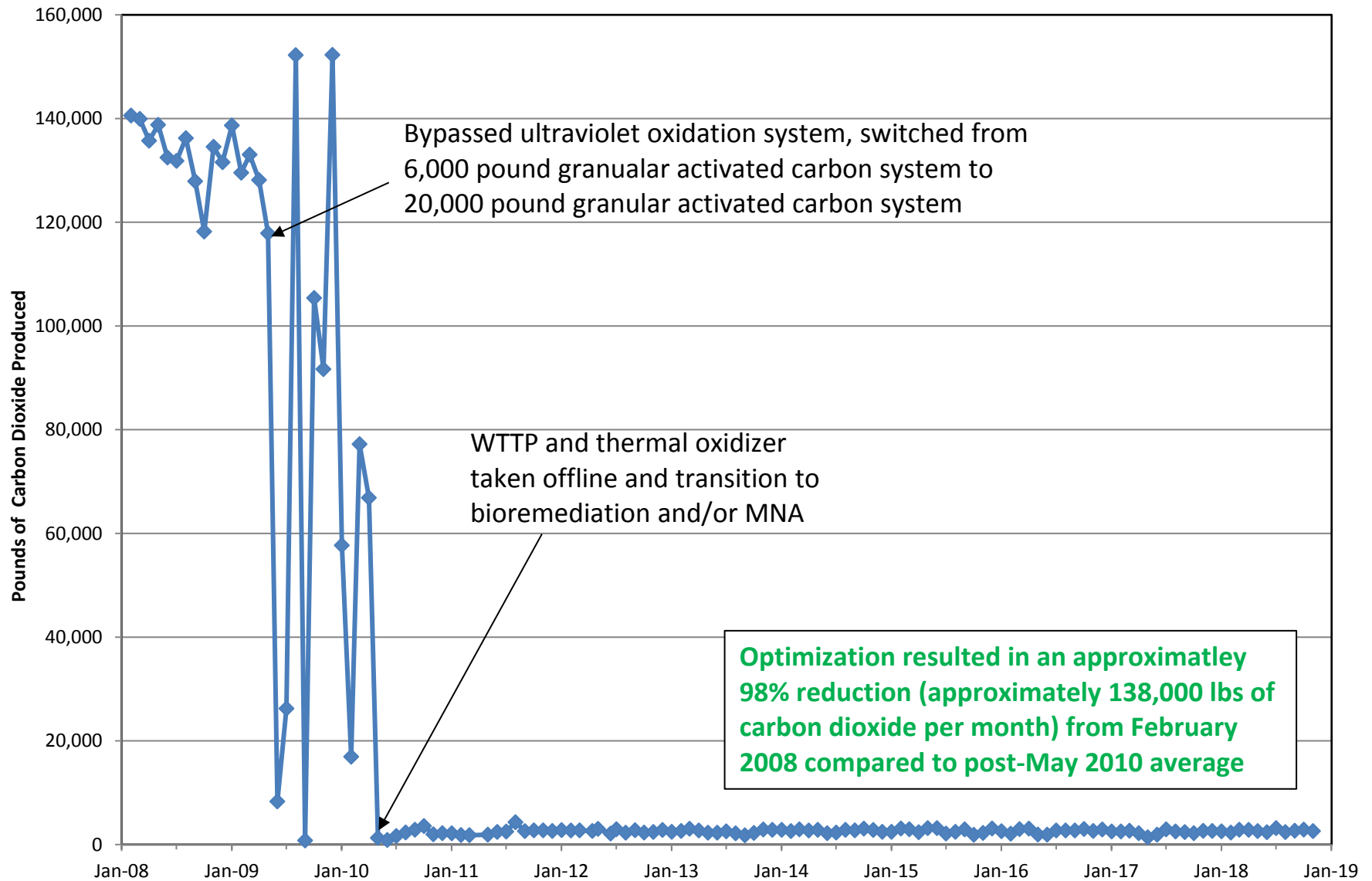


Figure 2

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



Subarea LF007C Groundwater Treatment Plant

Monthly Data Sheet

Report Number: 175

Reporting Period: 1 November 2018 – 7 December 2018

Date Submitted: 17 December 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 November 2018 reporting period:

Table 1 – Operations Summary – November 2018				
Initial Data Collection:		11/1/2018 11:30	Final Data Collection:	12/7/2018 11:35
Operating Time:		Percent Uptime:		Electrical Power Usage ^a :
LF007C GWTP:	765 hours	LF007C GWTP	88.5%	LF007C GWTP: 0 kWh
Gallons Treated: 181,774 gallons		Gallons Treated Since March 2000: 88.5 million gallons		
Volume Discharged to Duck Pond: 181,774 gallons				
VOC Mass Removed: 1.4 x 10 ⁻³ pounds ^b		VOC Mass Removed Since March 2000: 174.4 pounds (Groundwater)		
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 November 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 – November 2018		
Location	Average Flow Rate (gpm) ^a	Total Gallons Processed (gallons)
EW614x07	4.0	181,745 ^b
EW615x07	0.3	14,611
LF007C GWTP	4.0	181,774
^a Flow rates calculated by dividing total gallons processed by system operating time for the month or the average of the instantaneous readings.		
^b Significant amount of air was observed in extracted groundwater at EW614x07 during November 2018. This may result in distorted (inflated) totalizer reading at the wellhead.		
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	29 November 2018	8:30	3 December 2018	11:10	Pump controller malfunction.
-- = 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 6 November 2018. Sample results are presented in Table 4. TCE (0.90 J µg/L) was detected at the influent sample location. TCE (0.18 J µg/L) was also detected in the midpoint sample location. No VOCs were detected in the effluent sample locations; however, TPH-d (59 µg/L) was detected in the effluent sample at a concentration in excess of the effluent limitation of 50 µg/L. This detection, however, is instead a detection of biological matter and not petroleum. Additional details regarding these repeated TPH detections at the LF007C GWTP has been discussed with regulatory agencies (EPA, DTSC, Water Board) and will also be presented in a forthcoming technical memorandum.

During November 2018, the groundwater extracted from EW614x07 was found to contain a significant amount of air in the form of air bubbles. The source of the air bubbles may be related to drawdown within the well. The presence of air bubbles can lead to inflated values of flow and total gallons at the wellhead. On 8 November, an air relief valve was installed at the treatment plant to remove the air from the process line prior to entering the carbon vessels and system totalizer. The system totalizer therefore represents a more accurate reading of system flow and total gallons processed. The air relief valve will continue to remove air as it accumulates within the process line when the system is operational. Travis AFB will continue to monitor the totalizers at all three (3) locations (EW614x07, EW615x07, and at the treatment plant) in order to accurately monitor the amount of water processed by the LF007C GWTP.

Between 29 November and 3 December, the LF007C GWTP was shut down because the pump controller malfunctioned. In addition, a heavy storm was being projected for the weekend, so the system was temporarily turned off in case standing water was to form in the vicinity of the extraction wells. On 3 December, no standing water was observed, so the alarm for the pump controller was reset, and the system restarted without issue.

Figure 1 presents a chart of influent concentrations (total VOCs) at the LF007C GWTP versus time for the past twelve (12) months. Over the last 12 months, the trend for the VOC influent concentration, primarily TCE, has been decreasing. The average flow rate through the LF007C GWTP has decreased slightly over the last 12 months.

Optimization Activities

No optimization activities occurred at the LF007C GWTP in November 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 November 2018 – Subarea LF007C Groundwater Treatment Plant

Constituent	Instantaneous Maximum* (µg/L)	Detection Limit (µg/L)	N/C	6 November 2018 (µg/L)		
				Influent	After Carbon 1	Effluent
Halogenated Volatile Organics						
Acetone	NA	1.9	0	ND	ND	ND
Bromodichloromethane	5.0	0.17	0	ND	ND	ND
Bromoform	5.0	0.19	0	ND	ND	ND
2-Butanone	5.0	2.0	0	ND	ND	ND
Carbon Tetrachloride	0.5	0.19	0	ND	ND	ND
Chloroform	5.0	0.16	0	ND	ND	ND
Dibromochloromethane	5.0	0.17	0	ND	ND	ND
1,3-Dichlorobenzene	5.0	0.13	0	ND	ND	ND
1,4-Dichlorobenzene	5.0	0.16	0	ND	ND	ND
1,1-Dichloroethane	5.0	0.22	0	ND	ND	ND
1,2-Dichloroethane	0.5	0.13	0	ND	ND	ND
1,1-Dichloroethene	5.0	0.23	0	ND	ND	ND
cis-1,2-Dichloroethene	5.0	0.15	0	ND	ND	ND
trans-1,2-Dichloroethene	5.0	0.15	0	ND	ND	ND
Methylene Chloride	5.0	0.32	0	ND	ND	ND
Tetrachloroethene	5.0	0.20	0	ND	ND	ND
1,1,1-Trichloroethane	5.0	0.16	0	ND	ND	ND
1,1,2-Trichloroethane	5.0	0.27	0	ND	ND	ND
Trichloroethene	5.0	0.16	0	0.90 J	0.18 J	ND
Vinyl Chloride	0.5	0.10	0	ND	ND	ND
Non-Halogenated Volatile Organics						
Benzene	1.0	0.16	0	ND	ND	ND
Ethylbenzene	5.0	0.16	0	ND	ND	ND
Toluene	5.0	0.17	0	ND	ND	ND
Xylenes	5.0	0.19 – 0.34	0	ND	ND	ND
Other						
Total Petroleum Hydrocarbons – Gasoline	50	35	0	NM	NM	ND
Total Petroleum Hydrocarbons – Diesel	50	16	0	NM	NM	59
Total Petroleum Hydrocarbons – Motor Oil	50	24	0	NM	NM	ND

* In accordance with current National Pollutant Discharge Elimination System permit – January 2018.

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

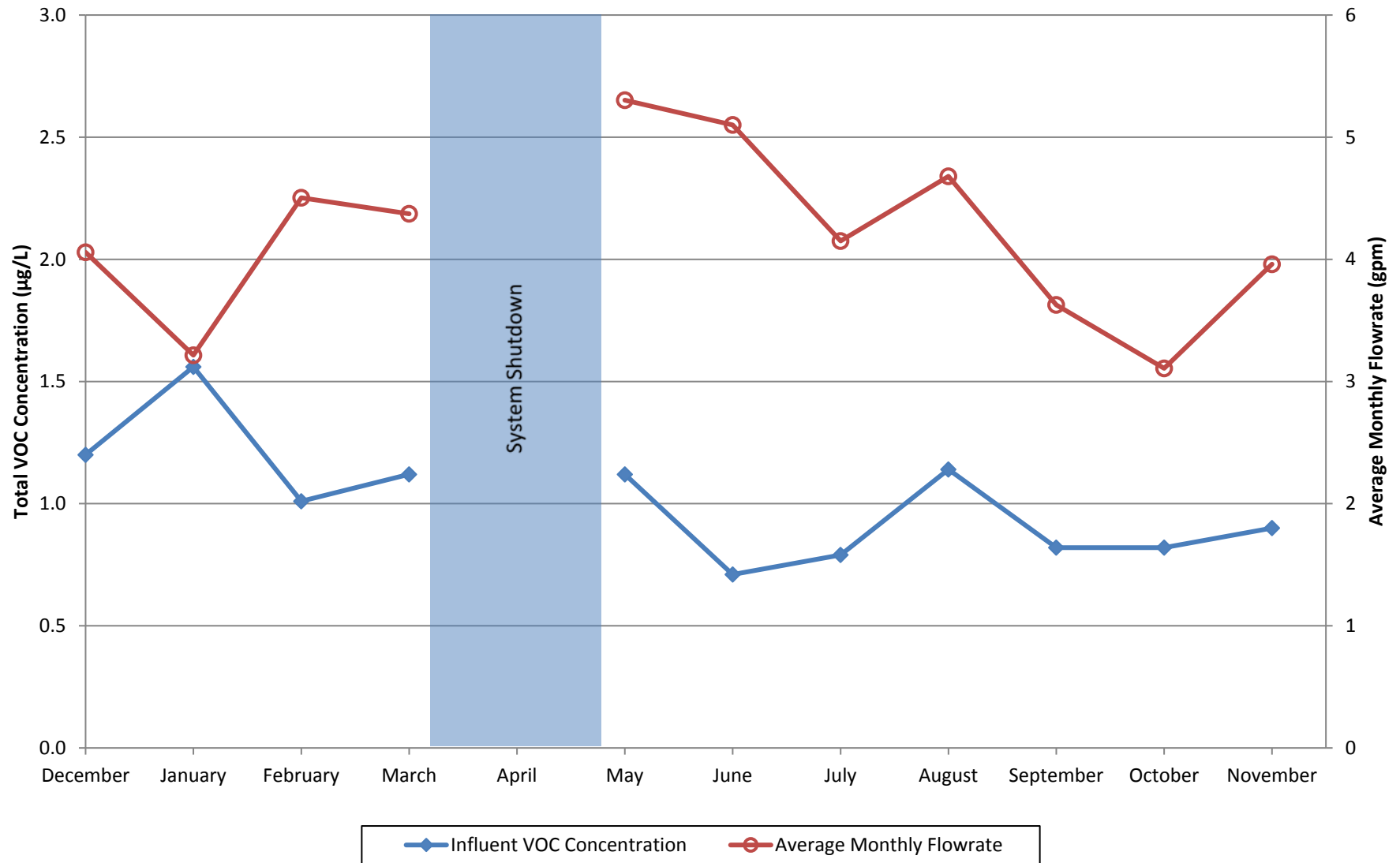
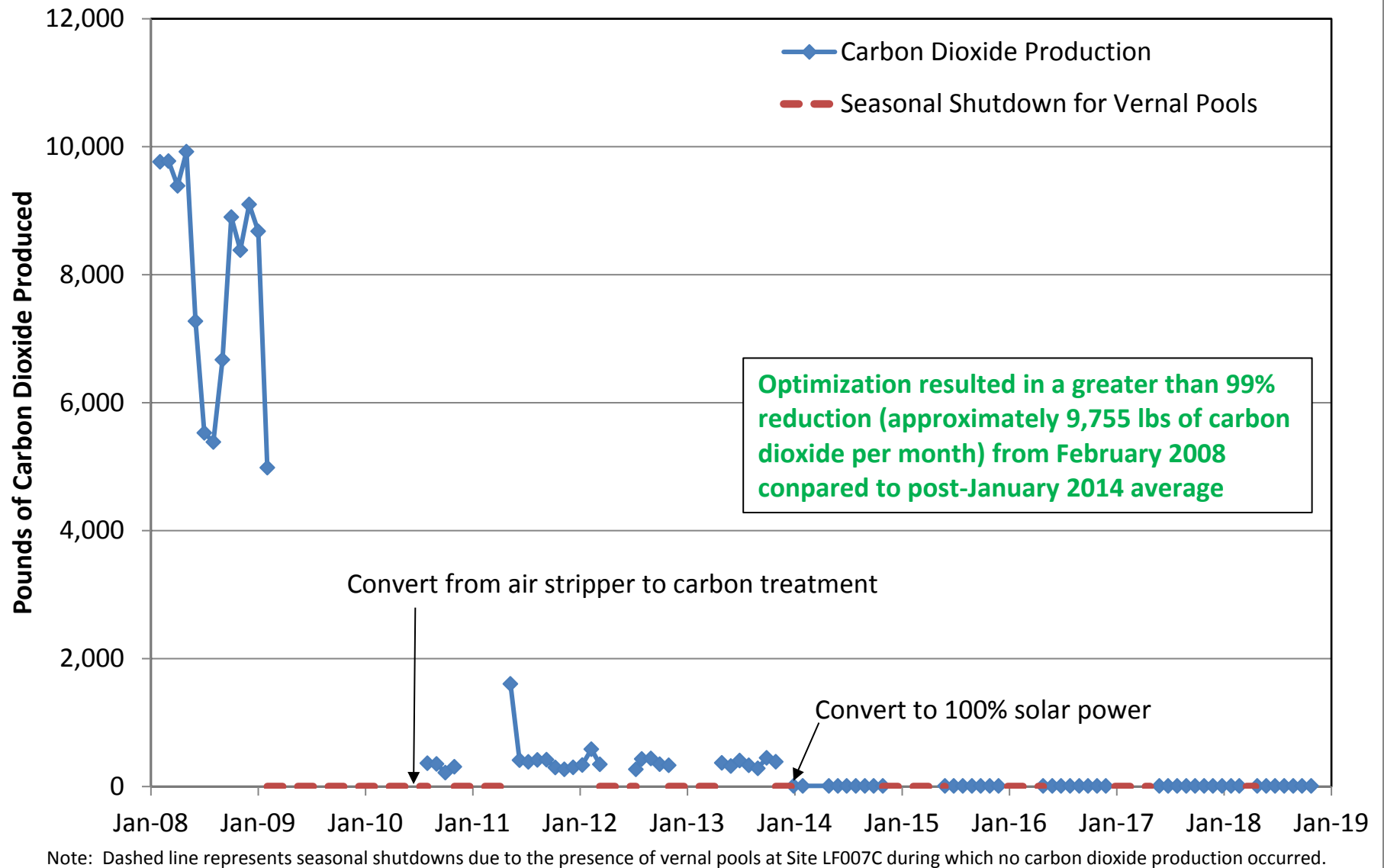


Figure 2
Equivalent Pounds of Carbon Dioxide Produced by the NGWTP/LF007C GWTP



Site ST018 Groundwater Treatment Plant

Monthly Data Sheet

Report Number: 093

Reporting Period: 1 November 2018 – 7 December 2018

Date Submitted: 17 December 2018

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

System Metrics

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

Table 1 – Operations Summary – November 2018			
Initial Data Collection:	11/1/2018 10:30	Final Data Collection:	12/7/2018 10:50
Operating Time:		Percent Uptime:	Electrical Power Usage:
ST018GWTP: 864 hours		ST018GWTP: 100%	ST018GWTP: 73 kWh (54 lbs CO₂ generated^a)
Gallons Extracted: 138,220 gallons		Gallons Extracted Since March 2011: 16.1 million gallons	
Volume Discharged to Sanitary Sewer: 138,220 gallons		Final Totalizer Reading: 16,058,789 gallons	
Cumulative Volume Discharged to Sanitary Sewer since 1 November 2014: 9,562,615 gallons			
MTBE, BTEX, VOC, TPH Mass Removed: 0.13 lbs^b		MTBE, BTEX, VOC, TPH Mass Removed Since March 2011: 46.0 lbs	
MTBE (Only) Removed: 0.07 lbs^b		MTBE (Only) Mass Removed Since March 2011: 11.2 lbs	
Rolling 12-Month Cost per Total Pounds of Mass Removed: \$11,078 ^{bc}			
Monthly Cost per Pound of Mass Removed: \$19,036 ^{bc}			
^a SiteWise™ estimate that 1 kilowatt hour generated produces 0.74 pounds of GHG. ^b Calculated using November 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 – November 2018		
Location	Average Flow Rate Groundwater (gpm)^a	Hours of Operation
EW2014x18	0.7	864
EW2016x18	0.7	864
EW2019x18	0.7	864
EW2333x18	0.6	864
ST018GWTP	2.7	864
^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.	--		--	
-- = Time not recorded ^a 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 6 November 2018. Because the extracted groundwater is no longer treated with carbon prior to discharge to the sewer, only discharge samples are now collected, rather than influent and effluent samples. Results are presented in Table 4. The complete November 2018 laboratory data report is available upon request. The MTBE discharge concentration during the November 2018 sampling event was 60 µg/L, which is an increase from the October 2018 sample result of 12 µg/L. TPH-d (50 µg/L), benzene (0.52 J µg/L), and 1,2-DCA (0.79 J µg/L) were also detected in the system discharge sample.

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 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 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 an increasing trend. The extracted MTBE concentrations and extracted total concentrations have generally been fluctuating over the past 12 months with a flat trend and a slightly increasing trend, respectively.

On 9 November, EW2014x18 was shut down because the pump and piping were severely fouled. The pump was removed, cleaned, and re-installed. EW2014x18 was restarted without issue.

Optimization Activities

No optimization activities occurred at the ST018GWTP in November 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 ST018GWTP system.

Figure 2 presents the historical GHG production from the ST018GWTP. The ST018GWTP produced 54 pounds of GHG during November 2018 and removed 138,220 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. Since the GAC vessels were removed, a slightly less amount of electricity will be required.

TABLE 4

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

				6 November 2018 (µg/L)
Constituent	Instantaneous Maximum* (µg/L)	Detection Limit (µg/L)	N/C	System Discharge
Fuel Related Constituents				
Methyl tert-Butyl Ether	6,400	0.25	0	60
Benzene	25,000 ^a	0.16	0	0.52 J
Ethylbenzene	25,000 ^a	0.16	0	ND
Toluene	25,000 ^a	0.17	0	ND
Total Xylenes	25,000 ^a	0.19 – 0.34	0	ND
Total Petroleum Hydrocarbons – Gasoline	50,000 ^b	10	0	ND
Total Petroleum Hydrocarbons – Diesel	50,000 ^b	16	0	50
Total Petroleum Hydrocarbons – Motor Oil	100,000	160 – 170	0	ND
Other				
1,2-Dichloroethane	20	0.15	0	0.79 J
Carbon Tetrachloride	NA	0.19	0	ND
Naphthalene	NA	0.22	0	ND

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

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

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

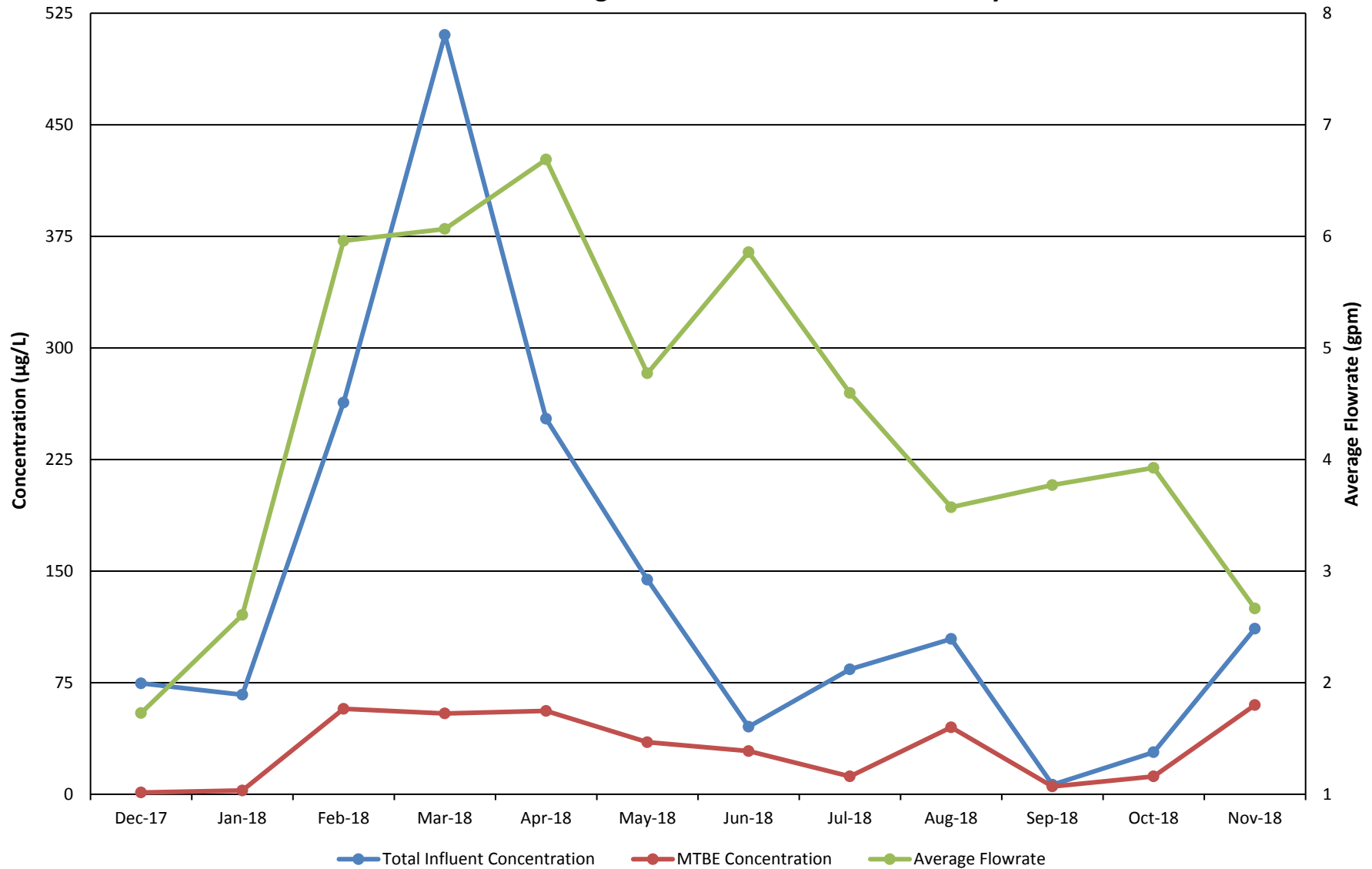
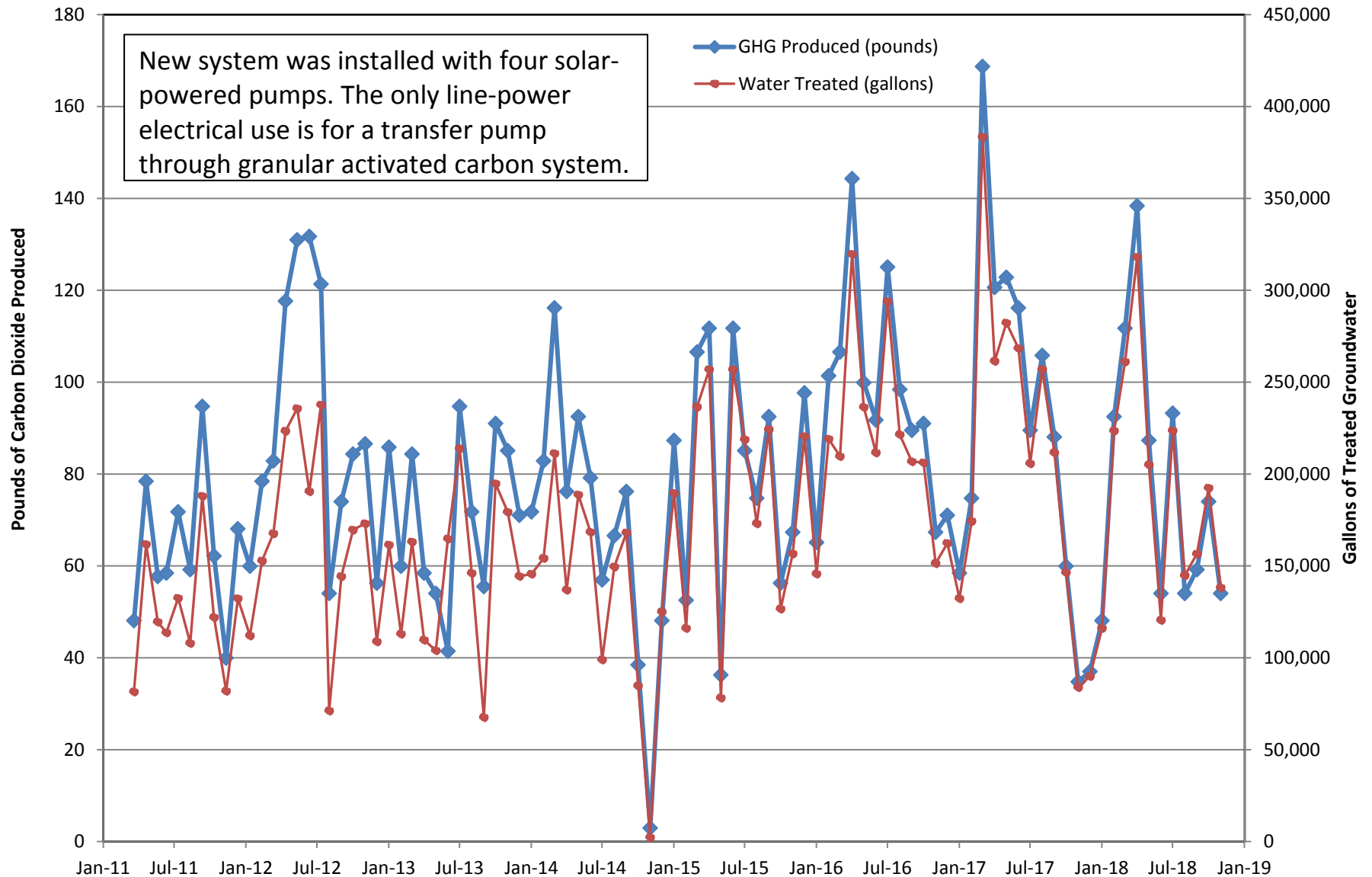


Figure 2

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



South Base Boundary Groundwater Treatment Plant

Monthly Data Sheet

Report Number: 218

Reporting Period: 7 December 2018 – 2 January 2019

Date Submitted: 14 January 2019

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 December 2018 reporting period.

Table 1 – Operations Summary – December 2018				
Initial Data Collection:		12/7/2018 12:50	Final Data Collection:	1/2/2019 11:00
Operating Time:		Percent Uptime:	Electrical Power Usage:	
SBBGWTP:	622 hours	SBBGWTP:	100%	SBBGWTP: 14,215 kWh (11,319 lbs CO ₂ generated ^a)
Gallons Treated: 5.4 million gallons			Gallons Treated Since July 1998: 1,088 million gallons	
Volume Discharged to Union Creek: 5.4 million gallons			Gallons Treated from Other Sources: 0 gallons	
VOC Mass Removed: 1.0 lbs^b			VOC Mass Removed Since July 1998: 510.7 lbs	
Rolling 12-Month Cost per Pound of Mass Removed: \$12,053 ^c				
Monthly Cost per Pound of Mass Removed: \$12,982 ^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 December 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 – December 2018							
FT005 ^b				SS029		SS030	
EW01x05	Offline	EW743x05	Offline	EW01x29	Offline ^c	EW01x30	10.6
EW02x05	Offline	EW744x05	3.3	EW02x29	Offline ^c	EW02x30	3.3
EW03x05	Offline	EW745x05	8.2	EW03x29	2.7	EW03x30	16.1
EW731x05	6.6	EW746x05	Offline	EW04x29	8.1	EW04x30	25.4
EW732x05	Offline	EW2291x05	3.2	EW05x29	8.0	EW05x30	Offline ^d
EW733x05	Offline	EW2782x05	4.7	EW06x29	6.6	EW2174x30	7.6
EW734x05	3.2	EW2783x05	7.7	EW07x29	13.4	EW711x30	3.8
EW735x05	10.9	EW2784x05	6.0			MW269x30	Offline ^e
EW736x05	Offline	EW2785x05	4.3				
EW737x05	Offline	EW2786x05	11.3				
EW742x05	Offline						
FT005 Total: 69.4				SS029 Total: 38.8		SS030 Total: 66.8	
SBBGWTP Average Monthly Flow ^f : 144.0 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 Extraction well was off line for maintenance.							
^e Well is dry. If water recharges, the extraction well will be restarted.							
^f 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	None.	--		--	
-- = 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 5 December 2018. Sample results are presented in Table 4. The total VOC concentration (22.96 µg/L) in the influent sample decreased from the November 2018 sample results (26.60 µg/L). TCE was the primary VOC detected in the influent sample at a concentration of 21 µg/L. TCE, cis-1,2-DCE, chloroform, 1,2-DCA, and chloromethane were detected in the midpoint sampling location at low concentrations. 1,2-DCA and chloromethane were detected in the final effluent sample. The 1,2-DCA concentration (0.48 J µg/L) was less than the instantaneous maximum effluent discharge limit of 0.50 µg/L, and chloromethane (detected at 0.58 J µg/L) does not have a discharge limit. A carbon change out will be scheduled if breakthrough conditions continue.

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

- EW05x29 – Replaced flowmeter paddlewheel and installed new shaft kit. Well is currently operating.
- EW06x29 – Pump motor was removed because it was not turning. After deep cleaning, motor was functioning properly. Well is currently operating.
- EW04x30 – Installed a new transducer. Well is currently operating.
- EW05x30 – Pump motor is seized and in need of replacement. The replacement motor will be installed once received. Well is currently off line.
- EW711x30 – Replaced flowmeter and totalizer components. Well is currently operating.

Figure 1 presents the influent 1,2-DCA and TCE concentrations since January 2017. Between July and October 2018, TCE influent concentrations have increased, while the 1,2-DCA influent concentrations have decreased to non-detect. In November 2018, TCE concentrations began to decrease, and in December 2018, 1,2-DCA reappeared in the influent sample.

Figure 2 presents a plot of influent VOC concentrations and average flow at the SBBGWTP over the past twelve (12) months. An overall increasing trend was observed for the VOC influent concentrations in the past 12 months. An overall slightly decreasing flow rate trend was observed in the past 12 months.

Optimization Activities

No optimization activities occurred at the SBBGWTP in December 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 3 presents the historical GHG production from the SBBGWTP. In December 2018, the SBBGWTP produced approximately 11,319 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 December 2018 – South Base Boundary Groundwater Treatment Plant

Constituent	Instantaneous Maximum* (µg/L)	Detection Limit (µg/L)	N/C	5 December 2018 (µg/L)		
				Influent	Midpoint	Effluent
Halogenated Volatile Organics						
Acetone	NA	2.1	0	ND	ND	ND
Bromodichloromethane	NA	0.29	0	ND	ND	ND
Carbon Tetrachloride	0.5	0.15	0	ND	ND	ND
Chloroform	5.0	0.12	0	0.16 J	0.28 J	ND
Chloromethane	NA	0.25	0	ND	1.2	0.58 J
1,1-Dichloroethane	5.0	0.15	0	ND	ND	ND
1,2-Dichloroethane	0.5	0.22	0	0.50 J	0.79 J	0.48 J
1,1-Dichloroethene	5.0	0.14	0	ND	ND	ND
cis-1,2-Dichloroethene	5.0	0.10	0	1.3	1.9	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	21	2.9	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	ND	NM	ND
Total Petroleum Hydrocarbons – Diesel	50	16	0	17 J	NM	ND
Total Petroleum Hydrocarbons – Motor Oil	50	160	0	ND	NM	ND

* In accordance with current National Pollutant Discharge Elimination System permit – effective January 2019.

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 Influent 1,2-DCA and TCE Concentrations Since January 2017

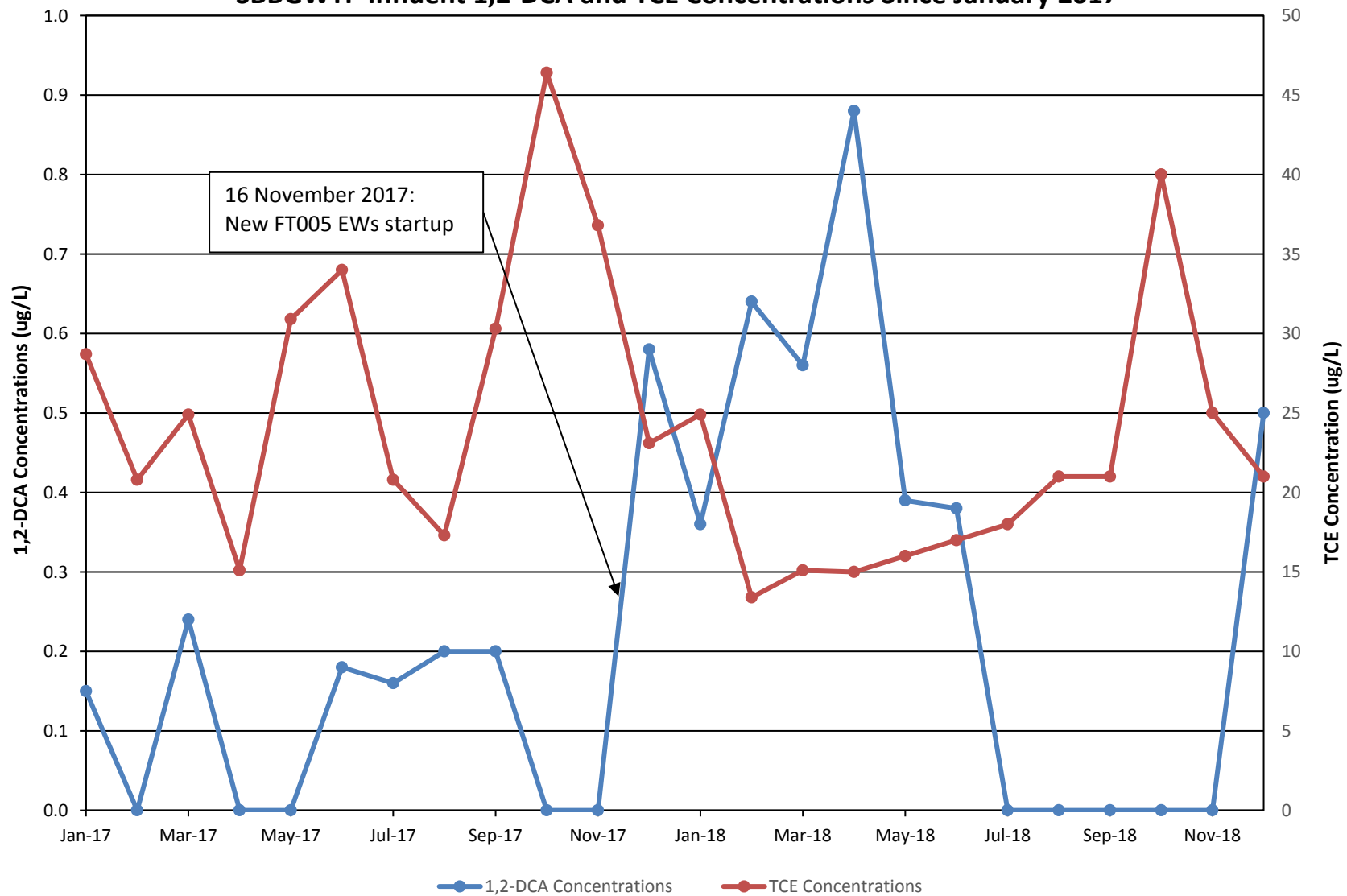


Figure 2
SBBGWTP Total VOC Influent Concentrations and Average Flowrate Twelve Month History

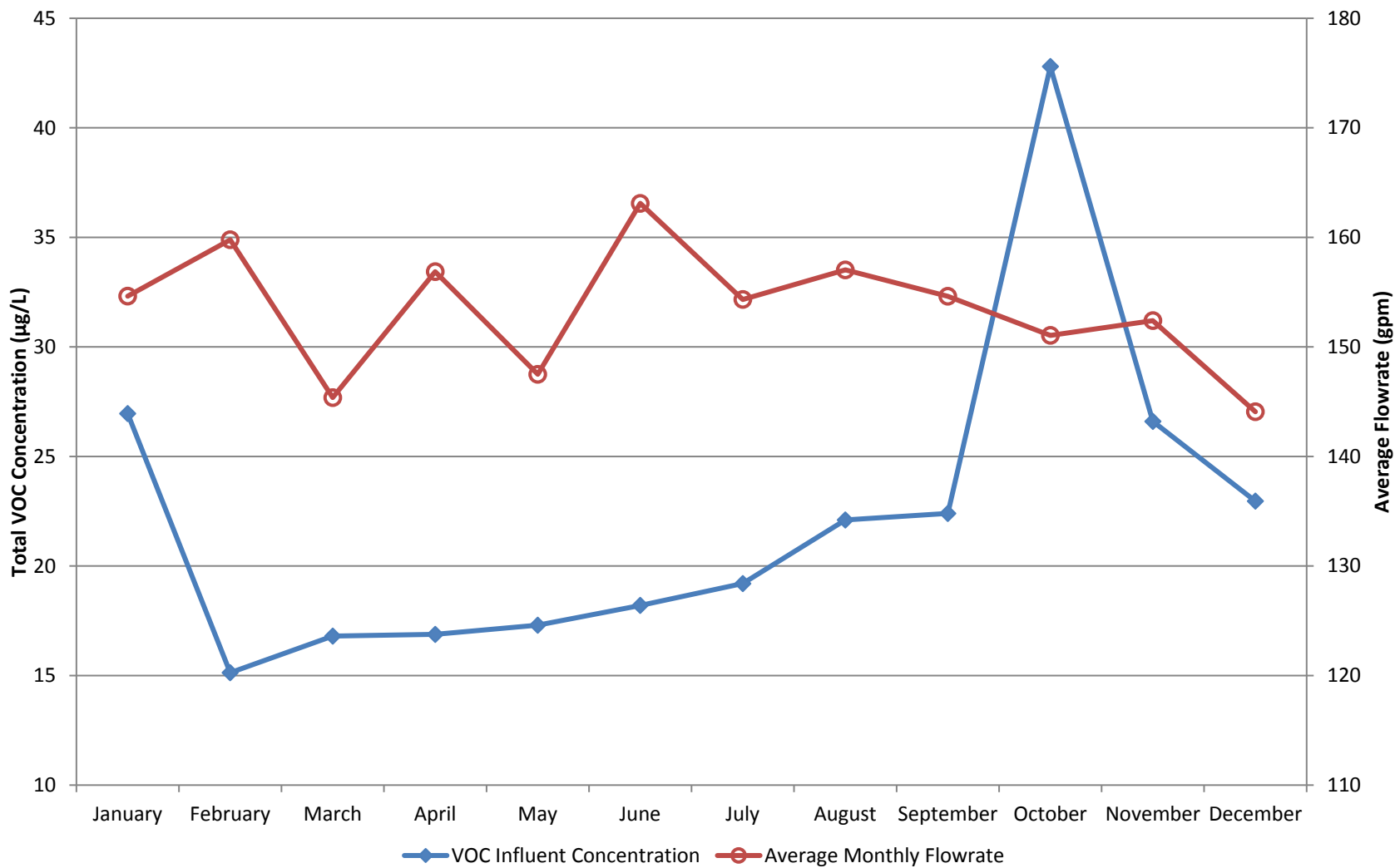
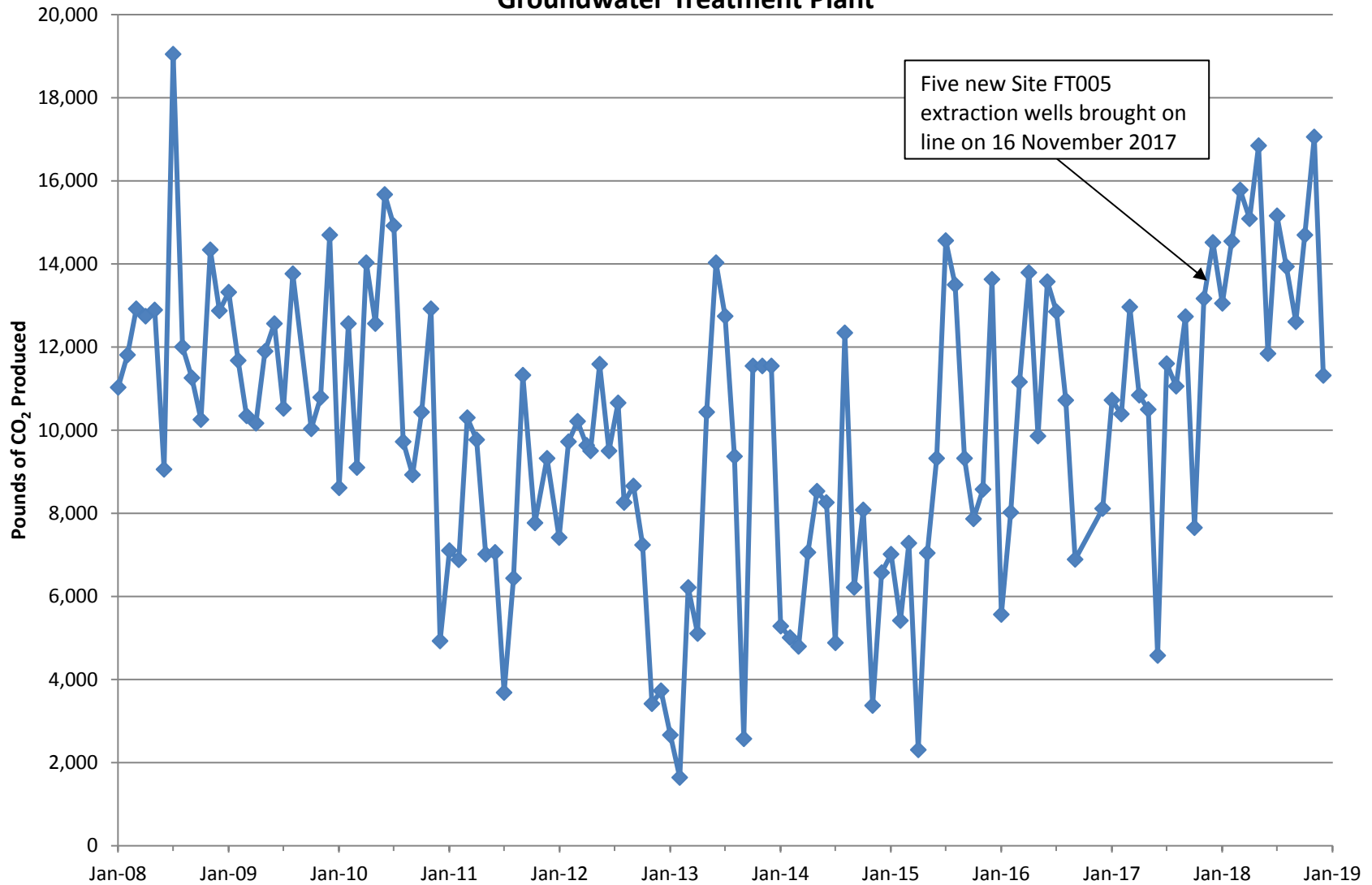


Figure 3

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



Central Groundwater Treatment Plant Monthly Data Sheet

Report Number: 233

Reporting Period: 7 December 2018 – 3 January 2019

Date Submitted: 14 January 2019

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 December 2018 reporting period.

Table 1 – Operations Summary – December 2018				
Initial Data Collection:		12/7/2018 9:20	Final Data Collection:	1/3/2019 11:55
Operating Time:		Percent Uptime:	Electrical Power Usage:	
CGWTP:	649 hours	CGWTP:	99.7%	CGWTP: 2,396 kWh (2,661 lbs CO ₂ generated ^a)
Gallons Treated (discharge to storm sewer):		Gallons Treated Since January 1996: 563.8 million gallons		
1,029,960 gallons				
VOC Mass Removed from groundwater:		VOC Mass Removed Since January 1996:		
1.9 lbs^b		2,822 lbs from groundwater		
		8,686 lbs from vapor		
Rolling 12-Month Cost per Pound of Mass Removed: \$3,599 ^c				
Monthly Cost per Pound of Mass Removed: \$3,672 ^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 December 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 during the monthly reporting period.

Table 2 – CGWTP Average Flow Rates ^a – December 2018	
Location	Average Flow Rate Groundwater (gpm)
EW001x16	11.7
EW002x16	6.8
EW003x16	0.1
EW605x16	5.5
EW610x16	2.5
CGWTP	26.5
^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	12 December 2018	9:15	12 December 2018	11:00	Remove debris from inlet of pump P-301.
-- = 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	26 December 2017	22 January 2018
	19 February 2018	21 March 2018
	16 April 2018	14 May 2018
	12 June 2018	9 July 2018
	7 August 2018	6 September 2018
	1 October 2018	30 October 2018
	27 November 2018	24 December 2018
MW = Monitoring Well		

Summary of O&M Activities

Monthly groundwater treatment samples were collected at the CGWTP on 5 December 2018. Sample results are presented in Table 5. The total VOC concentration (223.3 µg/L) in the December 2018 influent sample has increased from the November 2018 sample (194.81 µg/L). TCE was the primary VOC detected in the influent sample at a concentration of 180 µg/L. Vinyl chloride (0.29 µg/L) and chloromethane (2.7 µg/L) were detected in the sample after the first carbon vessel, and chloromethane (1.0 µg/L) was detected in the sample collected after the second carbon vessel. No VOCs were detected in the effluent sample. Travis AFB will continue to monitor influent, midpoint, and effluent concentrations at the CGWTP for carbon breakthrough, though the carbon treatment remained effective in December 2018.

In early December, the CGWTP experienced extended periods of decreased system flow. The low flow rate was due to a problem with the main system transfer pump. On 12 December, the system was shut down to investigate the cause of the decreased flow. After emptying the influent tank, a piece of plastic was found obstructing the inlet to the pump. In addition, a cracked check valve was replaced. The CGWTP resumed normal operation upon restart.

On 10 December, EW605x16 and EW610x16 were off line because the pump utility vault had flooded with rain water. The water was drained from the vault, and both pumps were brought back on line.

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 a decreasing trend for the flow rate through the treatment plant.

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 24 December 2018, as planned.

Optimization Activities

No optimization activities occurred at the CGWTP in December 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 2,661 pounds of GHG during December 2018.

TABLE 5

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

					5 December 2018 (µg/L)		
Constituent	Instantaneous Maximum* (µg/L)	Detection Limit (µg/L)	N/C	Influent	After Carbon 1 Effluent	After Carbon 2 Effluent	System Effluent
Halogenated Volatile Organics							
Acetone	NA	2.1 – 11	0	ND	ND	ND	ND
Chloroform	5.0	0.12 – 0.60	0	ND	ND	ND	ND
Chloromethane	NA	0.25 – 1.3	0	ND	2.7	1.0	ND
1,2-Dichlorobenzene	5.0	0.14 – 0.70	0	ND	ND	ND	ND
1,3-Dichlorobenzene	5.0	0.11 – 0.55	0	ND	ND	ND	ND
1,4-Dichlorobenzene	5.0	0.13 – 0.65	0	ND	ND	ND	ND
1,1-Dichloroethane	5.0	0.15 – 0.75	0	ND	ND	ND	ND
1,2-Dichloroethane	0.5	0.22 – 1.1	0	ND	ND	ND	ND
1,1-Dichloroethene	5.0	0.14 – 0.70	0	ND	ND	ND	ND
cis-1,2-Dichloroethene	5.0	0.15 – 0.50	0	41	ND	ND	ND
trans-1,2-Dichloroethene	5.0	0.15 – 0.55	0	2.3 J	ND	ND	ND
Methylene Chloride	5.0	0.35 – 1.8	0	ND	ND	ND	ND
Tetrachloroethene	5.0	0.15 – 0.75	0	ND	ND	ND	ND
1,2,3-Trichlorobenzene	5.0	0.14 – 0.70	0	ND	ND	ND	ND
1,1,1-Trichloroethane	5.0	0.19 – 0.95	0	ND	ND	ND	ND
1,1,2-Trichloroethane	5.0	0.31 – 1.6	0	ND	ND	ND	ND
Trichloroethene	5.0	0.16 – 0.65	0	180	ND	ND	ND
Vinyl Chloride	0.5	0.22 – 1.1	0	ND	0.29 J	ND	ND
Non-Halogenated Volatile Organics							
Benzene	1.0	0.13 – 0.65	0	ND	ND	ND	ND
Ethylbenzene	5.0	0.15 – 0.75	0	ND	ND	ND	ND
Toluene	5.0	0.25 – 1.3	0	ND	ND	ND	ND
Total Xylenes	5.0	0.18 – 0.90	0	ND	ND	ND	ND
Other							
Total Petroleum Hydrocarbons – Gasoline (C6 – C10)	50	10	0	ND	NM	NM	ND
Total Petroleum Hydrocarbons – Diesel (C10 – C28)	50	15 – 17	0	25 J	NM	NM	ND
Total Petroleum Hydrocarbons – Motor Oil (C28 – C40)	50 (trigger)	160 - 180	0	ND	NM	NM	ND

* In accordance with current National Pollutant Discharge Elimination System permit – January 2018.

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

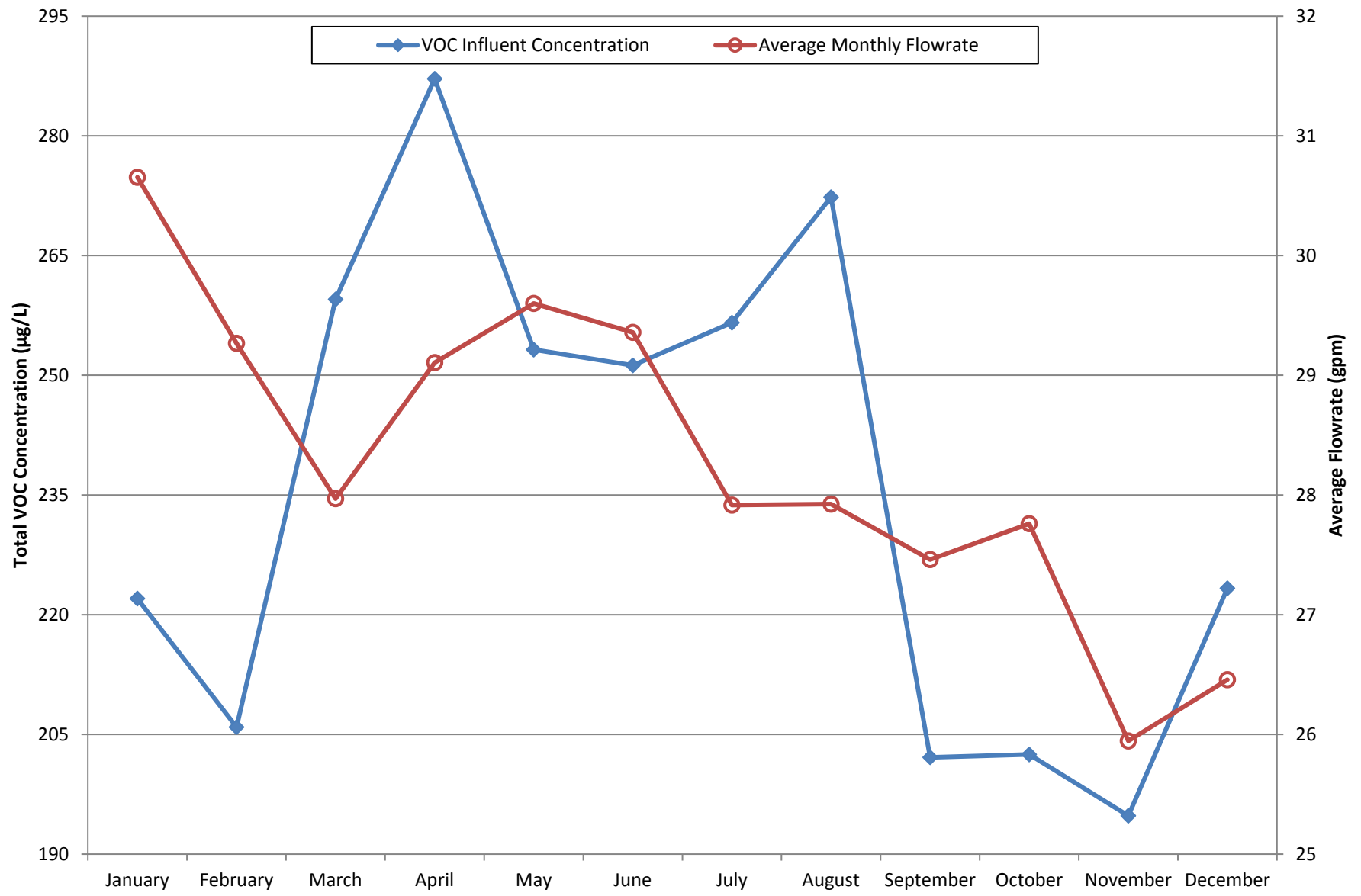
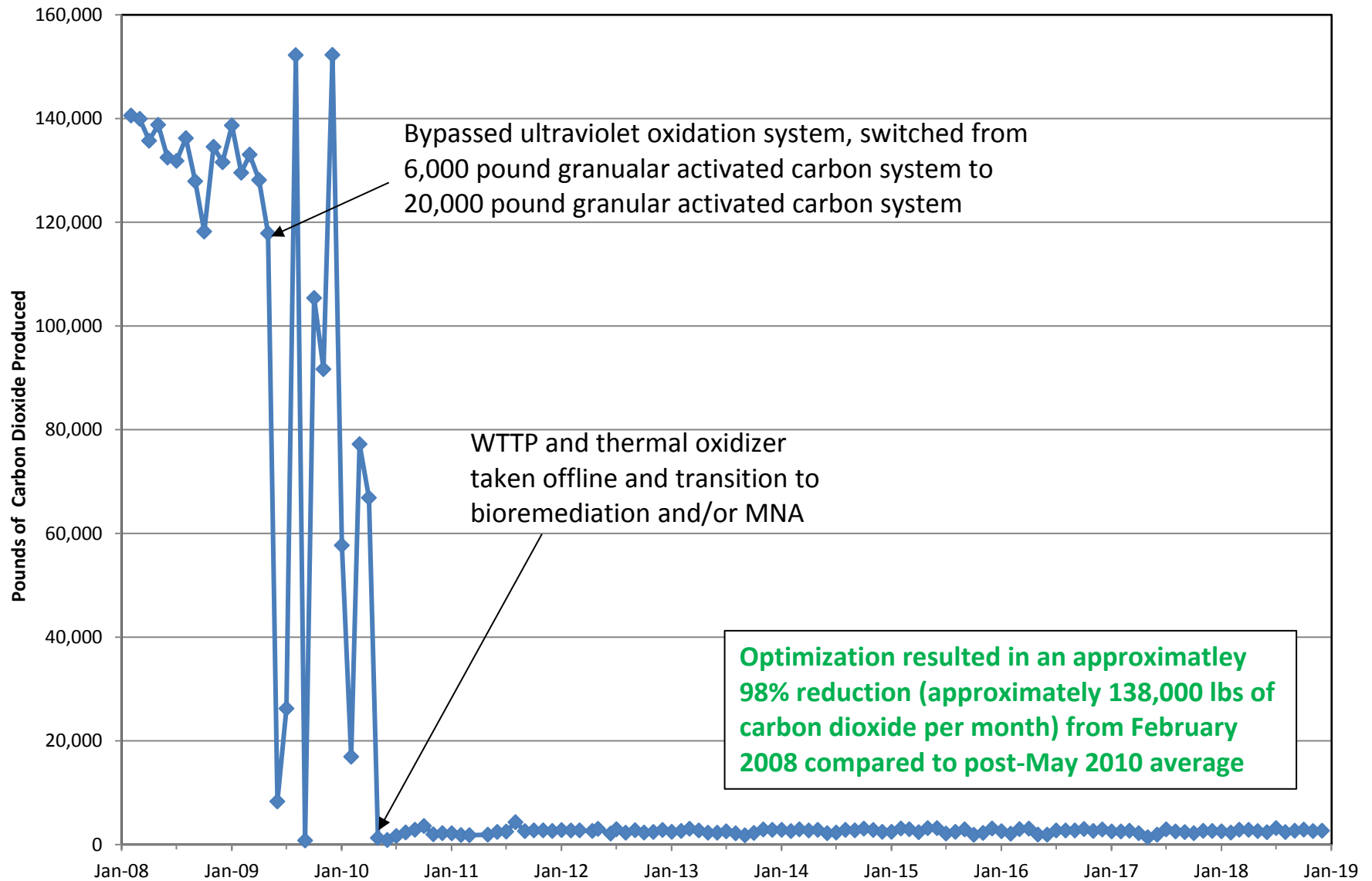


Figure 2

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



Subarea LF007C Groundwater Treatment Plant

Monthly Data Sheet

Report Number: 176

Reporting Period: 7 December 2018 – 2 January 2019

Date Submitted: 14 January 2019

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 December 2018 reporting period:

Table 1 – Operations Summary – December 2018				
Initial Data Collection:		12/7/2018 11:35	Final Data Collection:	1/2/2019 16:05
Operating Time:		Percent Uptime:		Electrical Power Usage ^a :
LF007C GWTP:	628 hours	LF007C GWTP	100%	LF007C GWTP: 0 kWh
Gallons Treated: 123,870 gallons		Gallons Treated Since March 2000: 88.6 million gallons		
Volume Discharged to Duck Pond: 123,870 gallons		VOC Mass Removed Since March 2000: 174.4 pounds (Groundwater)		
VOC Mass Removed: 1.5 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 December 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 – December 2018		
Location	Average Flow Rate (gpm) ^a	Total Gallons Processed (gallons)
EW614x07	3.2	119,179
EW615x07	0.3	10,646
LF007C GWTP	3.3	123,870
^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	None.	--		--	
-- = 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 5 December 2018. Sample results are presented in Table 4. TCE (1.3 µg/L) and cis-1,2-DCE (0.11 J µg/L) were detected at the influent sample location. TCE (0.27 J+ µg/L) and cis-1,2-DCE (0.15 J+ µg/L) were also detected in the midpoint sample location. No VOCs were detected in the effluent sample locations; however, TPH-d (53 µg/L) was detected in the effluent sample at a concentration in excess of the effluent limitation of 50 µg/L. This detection, however, is a detection of biological matter and not petroleum. Additional details regarding these repeated TPH detections at the LF007C GWTP has been discussed with regulatory agencies (EPA, DTSC, Water Board) and will have been presented in a technical memorandum.

Figure 1 presents a chart of influent concentrations (total VOCs) at the LF007C GWTP versus time for the past twelve (12) months. Over the last 12 months, the trend for the VOC influent concentration, primarily TCE, has been 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 December 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 December 2018 – Subarea LF007C Groundwater Treatment Plant

Constituent	Instantaneous Maximum* (µg/L)	Detection Limit (µg/L)	N/C	5 December 2018 (µg/L)		
				Influent	After Carbon 1	Effluent
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
Dibromochloromethane	5.0	0.13	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	0.11 J	0.15 J+	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	1.3	0.27 J+	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	15	1	61	NM	53
Total Petroleum Hydrocarbons – Motor Oil	50	160	0	NM	NM	ND

* In accordance with current National Pollutant Discharge Elimination System permit – January 2019.

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 an estimated value, biased high

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

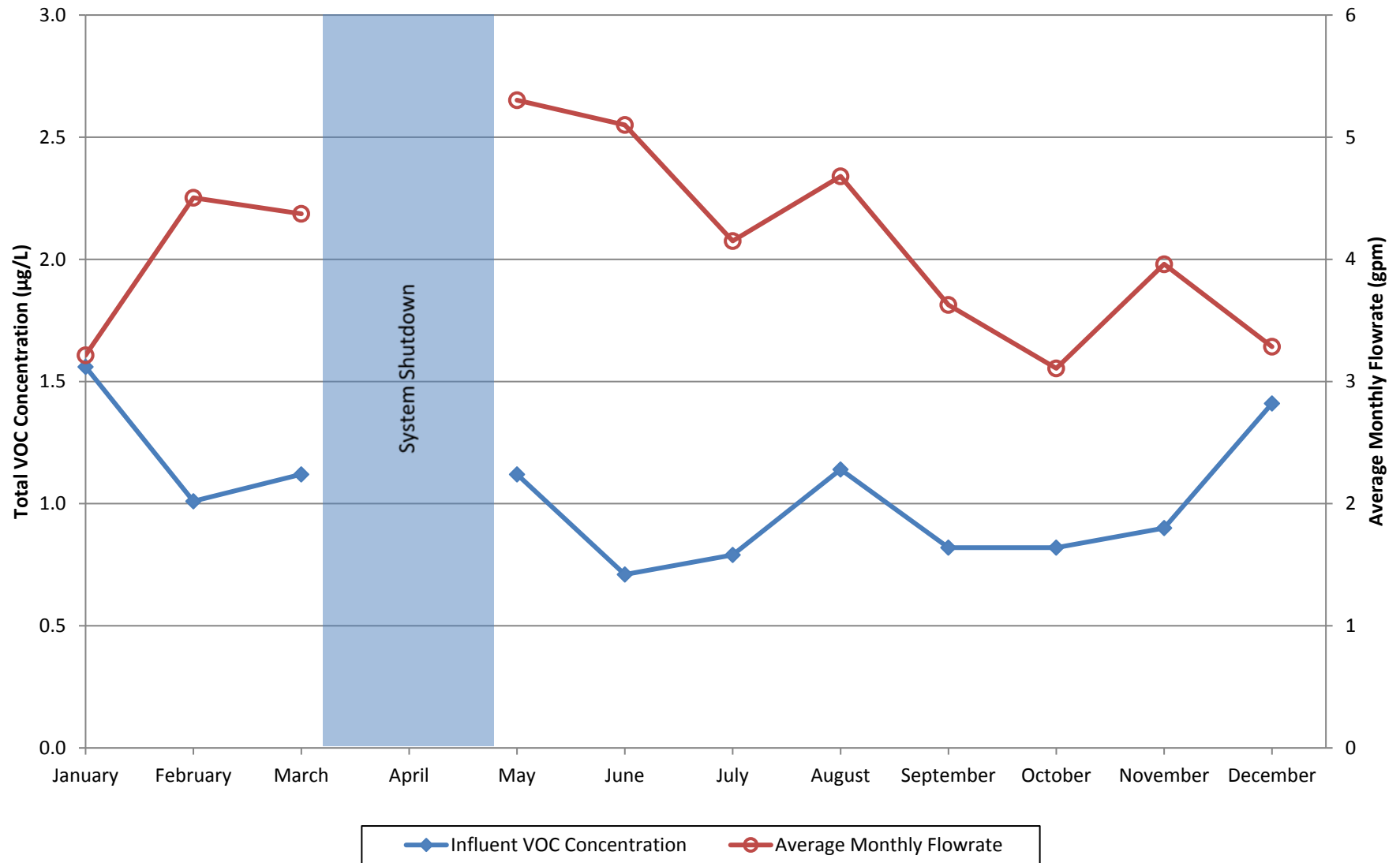
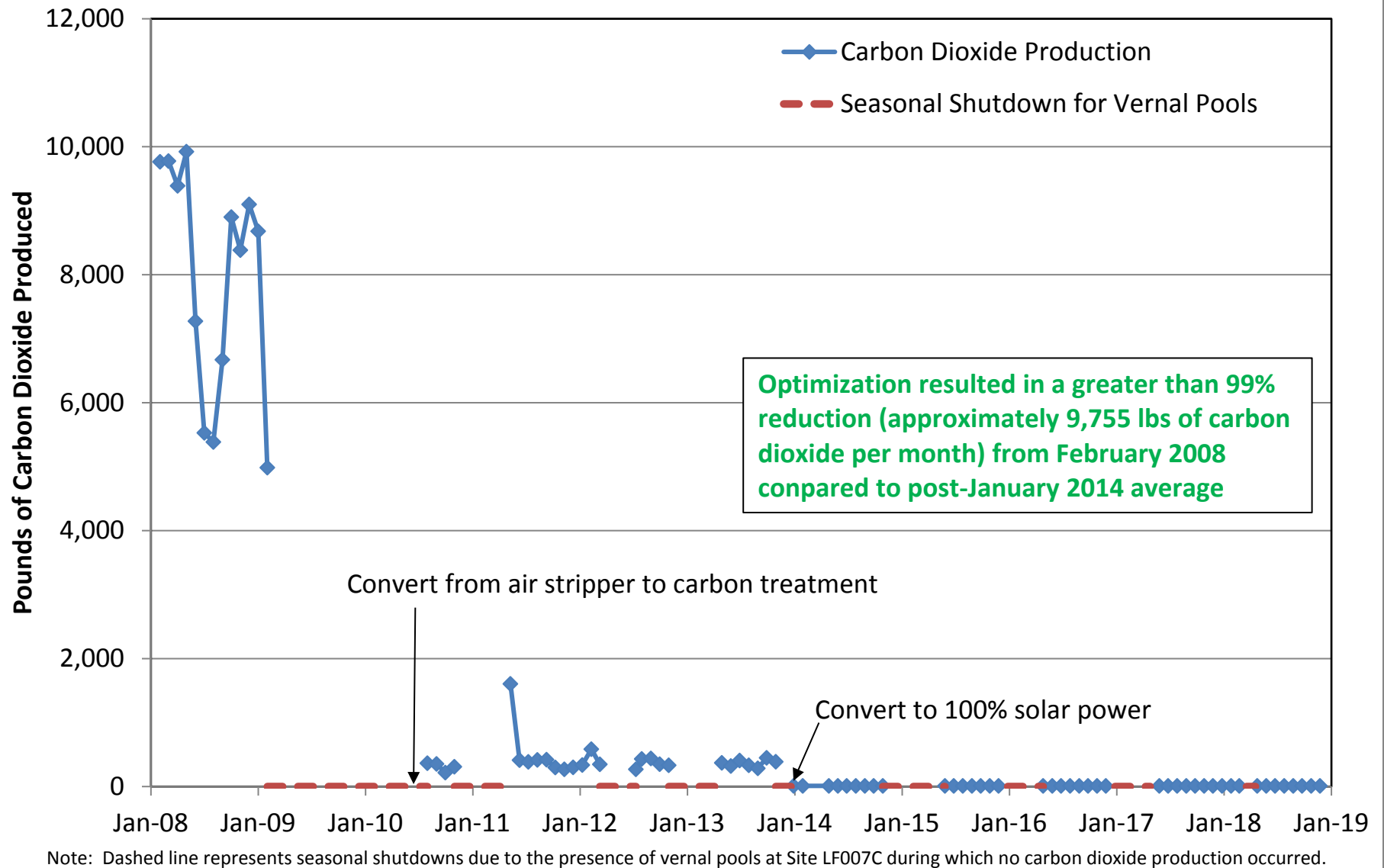


Figure 2
Equivalent Pounds of Carbon Dioxide Produced by the NGWTP/LF007C GWTP



Site ST018 Groundwater Treatment Plant

Monthly Data Sheet

Report Number: 094

Reporting Period: 7 December 2018 – 2 January 2019

Date Submitted: 14 January 2019

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

System Metrics

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

Table 1 – Operations Summary – December 2018			
Initial Data Collection:	12/7/2018 10:50	Final Data Collection:	1/2/2019 14:20
Operating Time:		Percent Uptime:	Electrical Power Usage:
ST018GWTP: 627 hours		ST018GWTP: 100%	ST018GWTP: 69 kWh (51 lbs CO ₂ generated ^a)
Gallons Extracted: 129,910 gallons		Gallons Extracted Since March 2011: 16.2 million gallons	
Volume Discharged to Sanitary Sewer: 129,910 gallons		Final Totalizer Reading: 16,188,699 gallons	
Cumulative Volume Discharged to Sanitary Sewer since 1 November 2014: 9,692,525 gallons			
MTBE, BTEX, VOC, TPH Mass Removed: 0.14 lbs ^b		MTBE, BTEX, VOC, TPH Mass Removed Since March 2011: 46.1 lbs	
MTBE (Only) Removed: 0.05 lbs ^b		MTBE (Only) Mass Removed Since March 2011: 11.3 lbs	
Rolling 12-Month Cost per Total Pounds of Mass Removed: \$10,823 ^{bc}			
Monthly Cost per Pound of Mass Removed: \$14,928 ^{bc}			
^a SiteWise™ estimate that 1 kilowatt hour generated produces 0.74 pounds of GHG.			
^b Calculated using December 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 – December 2018		
Location	Average Flow Rate Groundwater (gpm)^a	Hours of Operation
EW2014x18	0.8	627
EW2016x18	0.8	627
EW2019x18	0.8	627
EW2333x18	0.8	627
ST018GWTP	3.4	627
^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.	--		--	
-- = Time not recorded ^a 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 5 December 2018. Because the extracted groundwater is no longer treated with carbon prior to discharge to the sewer, only discharge samples are now collected, rather than influent and effluent samples. Results are presented in Table 4. The complete December 2018 laboratory data report is available upon request. The MTBE discharge concentration during the December 2018 sampling event was 46 µg/L, which is a decrease from the November 2018 sample result of 60 µg/L. TPH-d (80 µg/L), benzene (0.88 J µg/L), 1,2-DCA (0.77 J µg/L), and n-propylbenzene (0.16 J µg/L) were also detected in the system discharge sample.

There were no shutdowns of the ST018GWTP in December 2018; however, because of consecutive cloudy and foggy days, the extraction wells experienced decreased production throughout the monitoring period.

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 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 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. The extracted MTBE concentrations and

extracted total concentrations have generally been fluctuating over the past 12 months with a flat trend and a decreasing trend, respectively.

Optimization Activities

No optimization activities occurred at the ST018GWTP in December 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 ST018GWTP system.

Figure 2 presents the historical GHG production from the ST018GWTP. The ST018GWTP produced 51 pounds of GHG during December 2018 and removed 129,910 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. Since the GAC vessels were removed, a slightly less amount of electricity will be required.

TABLE 4

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

				5 December 2018 (µg/L)
Constituent	Instantaneous Maximum* (µg/L)	Detection Limit (µg/L)	N/C	System Discharge
Fuel Related Constituents				
Methyl tert-Butyl Ether	6,400	0.19	0	46
Benzene	25,000 ^a	0.13	0	0.88 J
Ethylbenzene	25,000 ^a	0.15	0	ND
Toluene	25,000 ^a	0.25	0	ND
Total Xylenes	25,000 ^a	0.10 – 0.18	0	ND
Total Petroleum Hydrocarbons – Gasoline	50,000 ^b	10	0	ND
Total Petroleum Hydrocarbons – Diesel	50,000 ^b	15	0	80
Total Petroleum Hydrocarbons – Motor Oil	100,000	160	0	ND
Other				
1,2-Dichloroethane	20	0.22	0	0.77 J
Carbon Tetrachloride	NA	0.15	0	ND
Naphthalene	NA	0.15	0	ND
N-Propylbenzene	NA	0.15	0	0.16 J

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

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

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

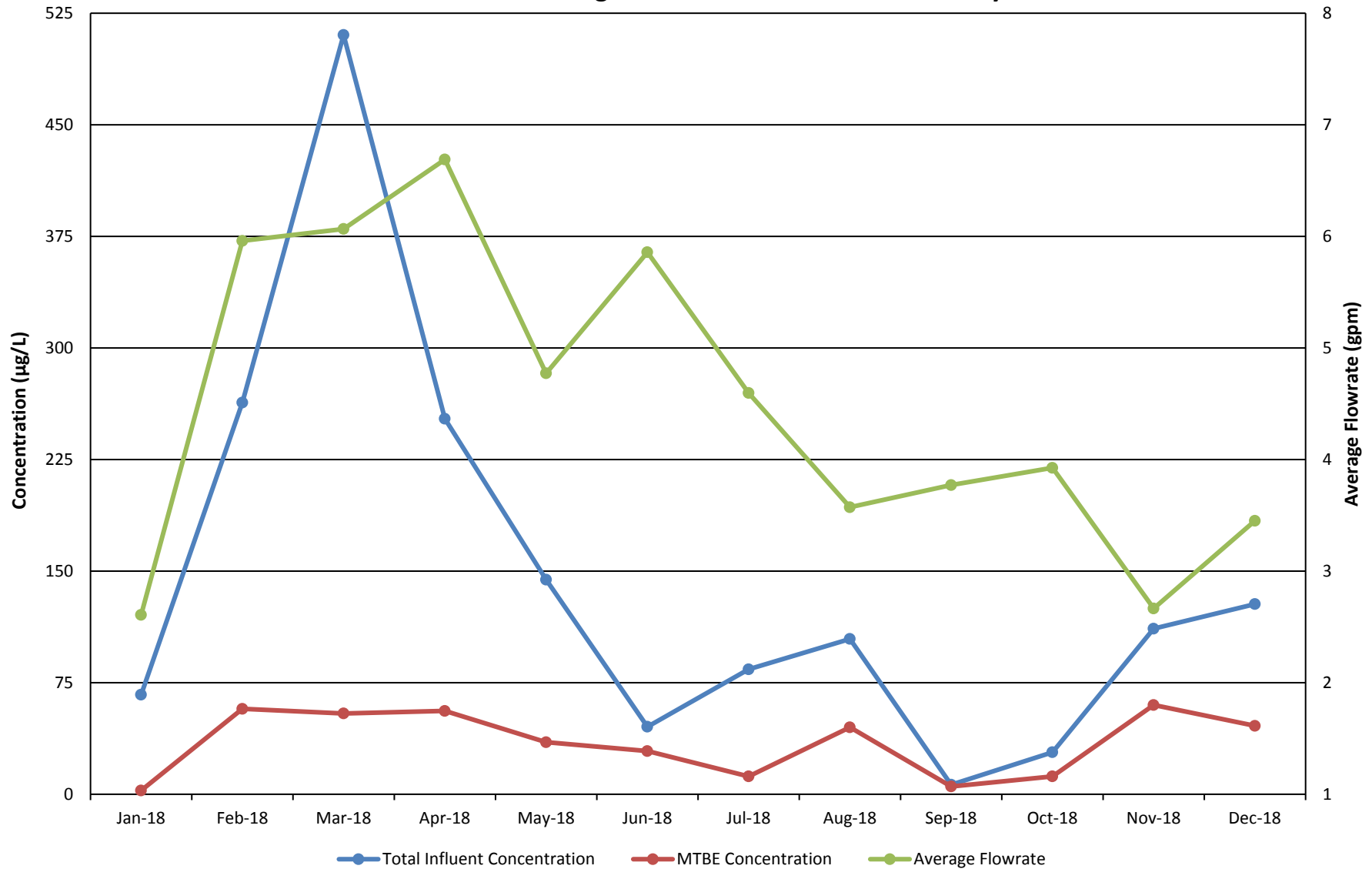
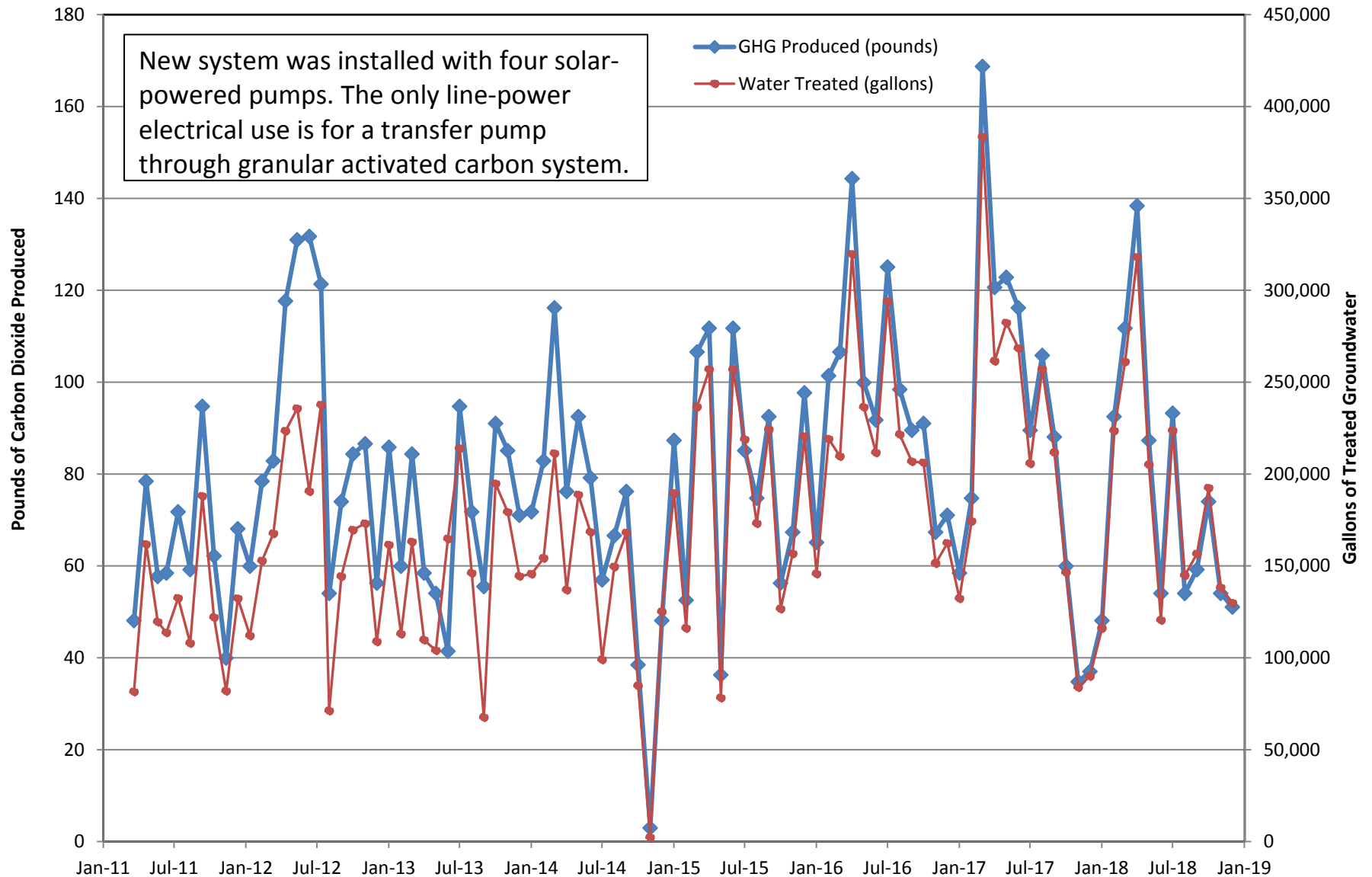


Figure 2

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

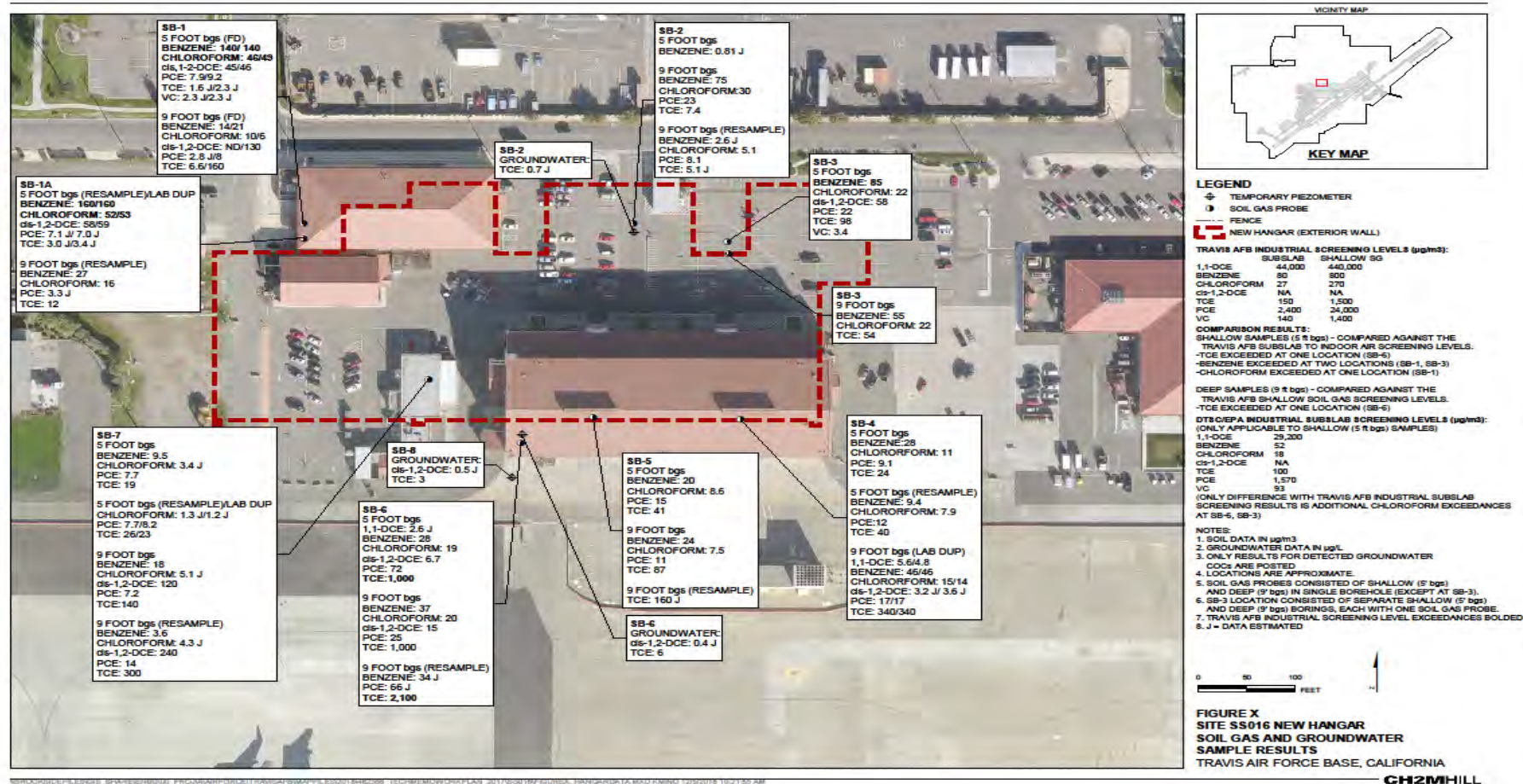


TRAVIS AFB

16 JANUARY 2019

Work Scheduled to take
place on locations with
Land Use Controls

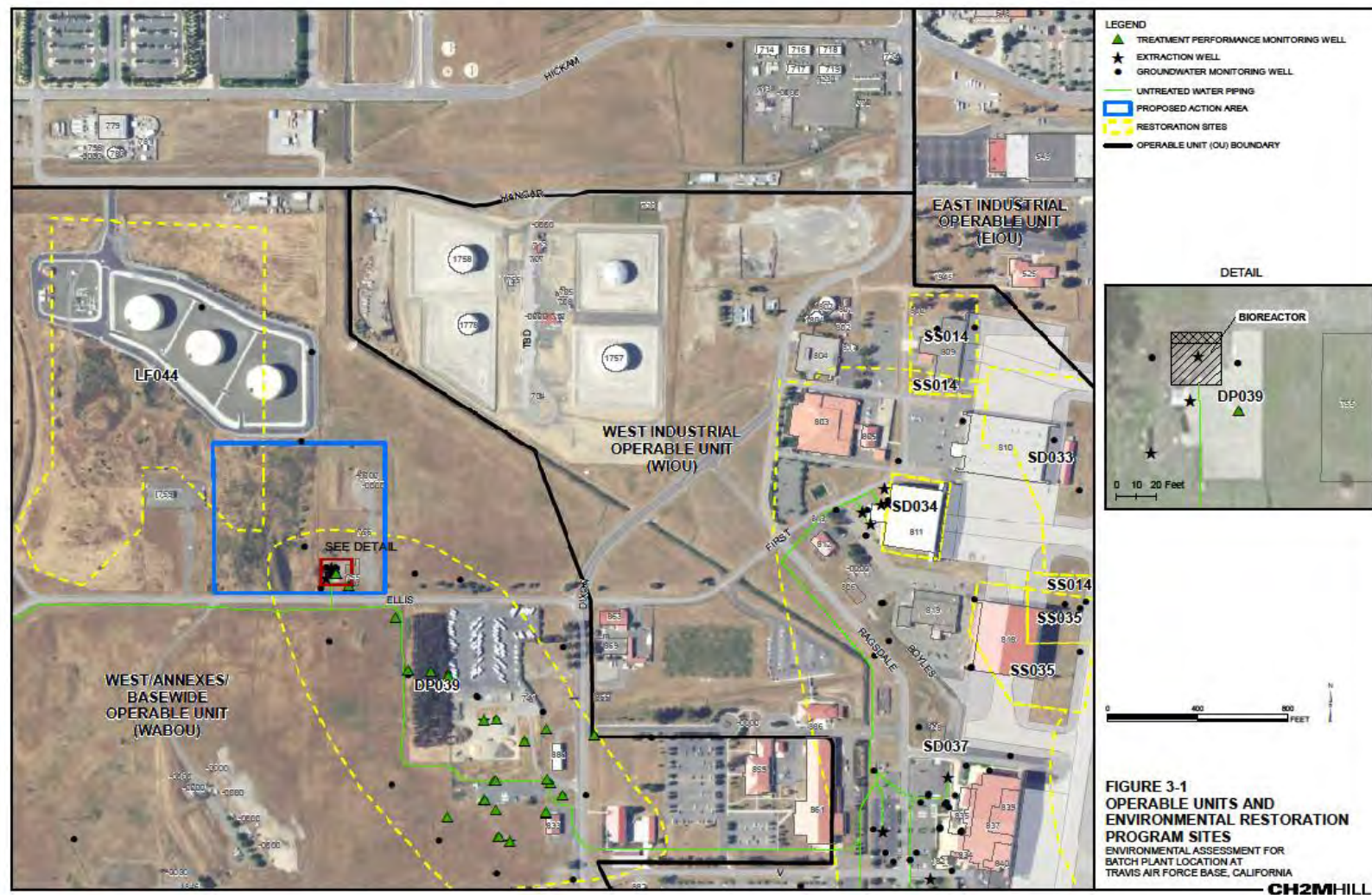
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KC-46 HANGAR

- ▶ VI sampling complete and report submitted to regulators
- ▶ Hangar design includes vapor barrier and passive vent system as required by groundwater ROD
- ▶ RD/RA WP to relocate horizontal well to be submitted


KC-46 HANGAR



CONCRETE BATCH PLANT AT LF044

- ▶ Will follow same process used for construction of fuel tank farm
- ▶ Area to be leveled and soil samples collected to determine if any contaminated soil or sediments remain
- ▶ Soils to be properly disposed of if contaminated and may be reused on base if clean
- ▶ Area to remain industrial with no planned residential use for the foreseeable future

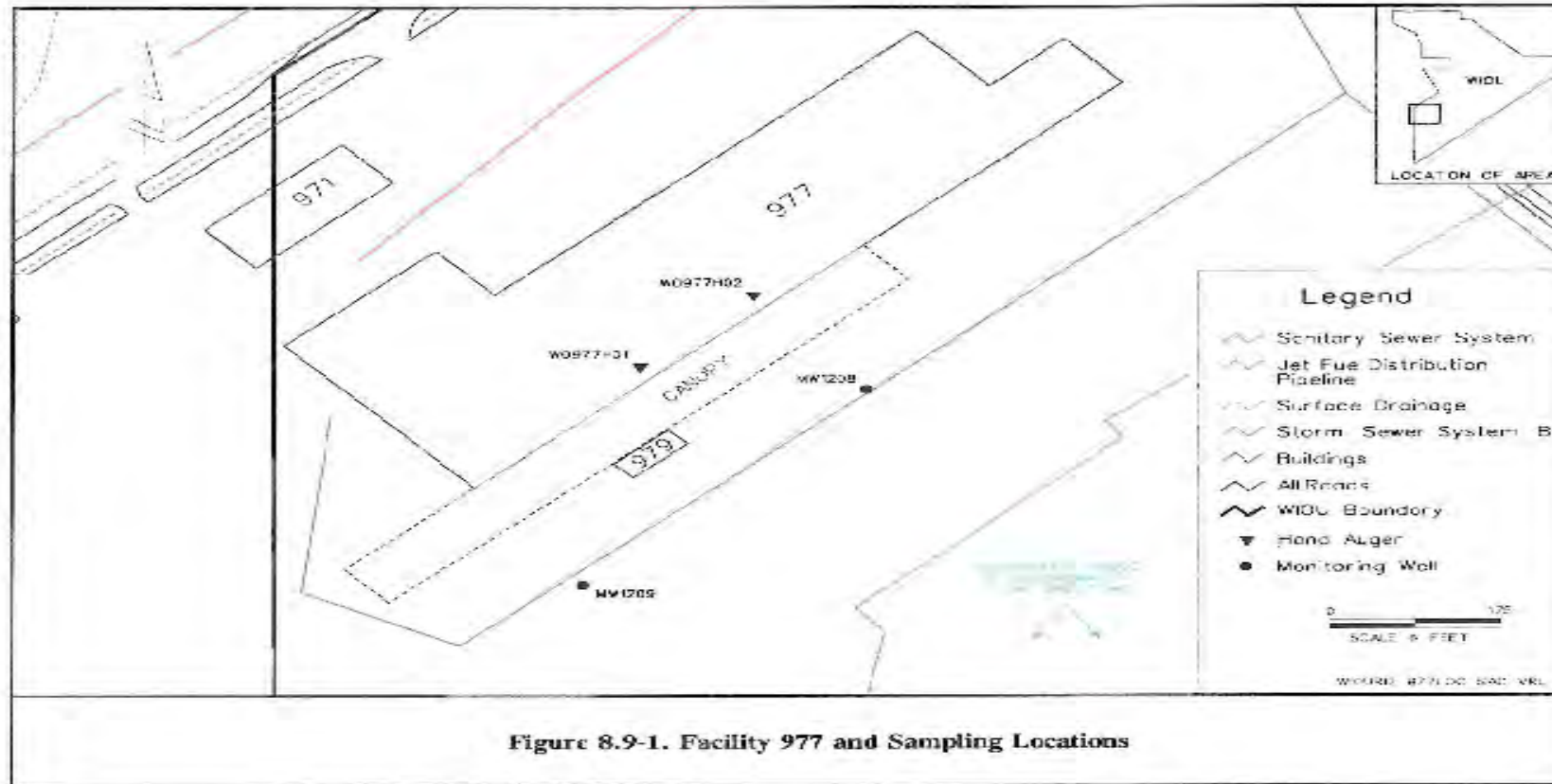
CONCRETE BATCH PLANT AT LF044

TRAVIS AFB FACILITY SITE APPROVAL		
1. PROJECT NAME Cal Water Facility	2. REQUEST DATE 12 December 2017	3. APPROVAL AVENUE Facilities Board and eSSS
<p>4. PROJECT DESCRIPTION California Water Service (Cal Water, CWS), Travis AFB's privatized water utilities company, requires a long-term (approx. 50 years) location for their administrative facility and equipment/material storage. Examples of equipment/material include trucks, excavators, and pipes. For the first 5 years, CWS plans to use a temporary facility/mobile trailer. CWS's temporary facility will require electrical service. Digging may be required to install electrical connections. Plans will be discussed in the future for a permanent facility.</p>		
<p>5. PROJECT SITE DESCRIPTION Site is located just West of the Outdoor Recreation facility off Ellis Dr. and Dixon Ave. Site contains trees which are not part of the restoration of groundwater contaminants just west of the site. The area that Cal Water proposes to use as a laydown area is on the edge of the plume and therefore if they have to dig to the water table to install utilities, they would need to ensure their personnel are protected from Volatile Organic Compounds, mainly TCE. To protect birds under the Migratory Bird Treaty Act, the project (if occurring between the months of February-August) must have a biologist perform a pre-construction site survey at least 14 calendar days before construction to determine whether any nesting birds are present on or near the site. If nesting birds are present on or near the site, construction may be temporarily postponed until the nesting season is over. Other measures which may be necessary if protected species are found on or near the site during the pre-construction survey include: (1) the work crew may be prohibited from disturbing areas within a specified distance of owl burrows or bird nests; (2) the work crew will restrict activities during breeding and nesting seasons; (3) construction will be temporarily delayed while birds are encouraged to relocate away from the construction area. Coordinate with 60 CES/CEIE Natural Resources Manager (NRM, 707-424-8354) at least 30 calendar days in advance to arrange the pre-construction site survey. No other environmental concerns exist. Site is consistent with the Installation Development Plan.</p>		
<p>6. PROJECT SITE AREA</p> 		

CALWATER SITING AT DP039

- ▶ 50 year contract for Calwater to operate and maintain drinking water infrastructure
- ▶ Temporary facilities (trailers) to be used for a minimum of the first 5 years of this contract
- ▶ Permanent facilities to be discussed at a future date

CALWATER SITING AT DP039



NEW CARGO FACILITY AT BLDG 977,
SITE SD037

- ▶ Existing cargo handling facility to be demolished and replaced
- ▶ Soil samples will be collected to determine current TPH levels after nearly 25 years of natural attenuation
- ▶ Soil to be characterized and properly managed and disposed of if still containing TPH

NEW CARGO FACILITY AT BLDG 977,
SITE SD037

Travis AFB Restoration Program

Program Update

RPM Meeting
January 16, 2019

Note: Documents marked in yellow are delayed due to the
government shutdown

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
- 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***

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
- 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***

Documents In-Progress

CERCLA

- Amendment to the NEWIOU Soil ROD for Sites SS016 and SD033
- Community Relations Plan Update (revised draft)
- 4th Five Year Review Report for Multiple Groundwater, Soil, and Sediment Sites
- SS016 RD/RA Work Plan
- 2017 Annual GRISR
- SS015 Soil Sampling Results Tech Memo

Documents In-Progress

MMRP

- NFA ROD for Old Skeet Range (TS060/TS060A MRA)

POCO

- Subarea LF007C TPH Chromatogram Review TM

Field Work In-Progress

CERCLA

- SS046 Soil excavation

POCO

- None

Documents Planned

CERCLA

- SD031 Soil RI/FS TBD
- Addendum to the Site SS016 Groundwater
RD/RA Work Plan Jan
- LF006 Technology Demonstration Construction
Completion Report Jan

MMRP

- None

POCO

- None

Field Work Planned

CERCLA

- SS016 Soil excavation (waiting on NEWIOU ROD amendment) TBD
- 1Q 2019 GRIP Sampling Feb
- ***LUC Inspections*** ***Jan***

POCO

- None

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

Petroleum Technology Demonstration Projects (1)

- SS014: Recycled Drywall SBGR (No new information)
 - 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 15 months
 - TPH-G: 99% reduction in source area (1,900 to 15 J mg/L), 51% for remaining 6 site wells (was 34% after 9 months and 18% after 3 months)
 - TPH-D: 98% reduction in source area (5,500 to 92 mg/L), 38% for remaining 6 site wells (was 61% after 9 months and 33% after 3 months)
 - Benzene: 98% reduction in source area (22 to <0.4 mg/L), 87% for remaining 6 site wells (was 61% after 9 months and 49% after 3 months)

SBGR = Sulfate Biogeochemical Reactor

Updates in Green Font

Petroleum Technology Demonstration Projects (2)

- SD034: Aerobic Washboard SBGR (No new information)
- 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) through first 20 months
 - TPH-D baseline 9,600 ug/L was reduced to 40 J ug/L after 15 months, with increase to 890 ug/L at 20 months (Was 98% reduction after 9 months. Concentration fluctuations are to be expected as higher concentration areas are flushed as part of the washboard effect)
 - TPH-MO baseline 2,300 ug/L was reduced to 89 J ug/L after 15 months, with increase to 760 ug/L at 20 months (Was 91% reduction after 9 months)
- Plume hot spot monitoring well (MW02x34) through first 20 months
 - TPH-D baseline 8,300 ug/L was reduced to 6,800 ug/L after 15 months, with increase to 13,000 ug/L at 20 months (Was 87% reduction after 9 months. Concentration fluctuations are to be expected as higher concentration areas are flushed as part of the washboard effect)
 - TPH-MO baseline 1,500 ug/L was reduced to 660 J ug/L after 15 months, with non-detect at elevated detection limit at 20 months (Was 72% reduction after 9 months, seeing some fluctuations)

* SBGR = Subgrade Biogeochemical Reactor

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)
 - 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 reductions at ST027B, but still too early to evaluate if bioaugmentation was beneficial
 - 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 ug/L), and to the north (in MW2187x36, TCE reduced from 1,400 to 84 ug/L). Still too early to evaluate if bioaugmentation was beneficial
- 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

CVOC Technology Demonstration Projects (4)

- FT004: Distribution of EVO via SBGR and/or Groundwater Extraction (No new information)
 - 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
 - TOC increase (and TCE decrease from 330 to 63 ug/L) in northern plume area following reinjection
 - 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 (so recirculation is working, but we are fighting additional TCE mass)

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
 - Early indications:
 - Recirculation through chimneys 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% (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 99% (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 cross-gradient area), conducted reinjection of EVO in 2017
 - While the demonstration has treated the originally defined groundwater plume area to below MCLs, we are waiting on 2Q19 data to evaluate effects of reinjections, since there is additional mass being pulled in from cross-gradient that we are continuing to evaluate

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 Memorandum²²

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