

**Travis Air Force Base
Environmental Restoration Program
Restoration Program Manager's
Meeting Minutes
20 September 2017, 0930 Hours**

Mr. Lonnie Duke of the Air Force Civil Engineer Center (AFCEC) Restoration Installation Support Section (ISS) conducted the Restoration Program Manager's (RPM) teleconference on 20 September 2017 at 0930 hours in Building 248 at Travis AFB, California. Attendees included:

Lonnie Duke	AFCEC/CZOW
Glenn Anderson	AFCEC/CZOW
Milton 'Gene' Clare	AFCEC/CZOW
Angel Santiago Jr.	AFCEC/CZOW
Merrie Schilter-Lowe	Travis AFB/PAO
Monika O'Sullivan	AFCEC/CZOW
Adriana Constantinescu (via telephone)	RWQCB
Ben Fries (via telephone)	DTSC
Nadia Hollan Burke (via telephone)	USEPA
Mike Riggle	USACE/Omaha
Jeff Gamlin (via telephone)	CH2M
Tony Chakurian	CH2M
Mike Wray	CH2M

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

Attachment 1	Meeting Agenda
Attachment 2	Master Meeting and Document Schedule
Attachment 3	SBBGWTP Monthly Data Sheet (August 2017)
Attachment 4	CGWTP Monthly Data Sheet (August 2017)
Attachment 5	LF007C GWTP Monthly Data Sheet (August 2017)
Attachment 6	ST018 Monthly Data Sheet (August 2017)
Attachment 7	Presentation: Triad Update Site FT005

1. ADMINISTRATIVE

A. Previous Meeting Minutes

The 16 August 2017 RPM meeting minutes were approved and finalized as written.

B. Action Item Review.

Action items from August 2017 were reviewed.

Action item 1 is ongoing: Ms. O'Sullivan to provide updates on perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA). 20 September 2017 update: Ms. O'Sullivan noted that the screening level PFOS/PFOA soil and groundwater sampling was completed between 24 August and 5 September, in accordance with EPA Site Inspection (SI) Sampling guidance. Seventeen locations were sampled despite challenging weather and drill rig conditions. Eleven locations were planned for 4 September and only 6 were completed; these are planned for October; approval for sampling up to 24 October has been coordinated with the US Fish and Wildlife Service (USFWS), and a biologist will be onsite. Ms. O'Sullivan agreed to notify Ms. Burke when the remaining samples will be collected. Mr. Duke commended the team for the sampling event conducted on the flightline, noting that approvals for flightline work are more difficult to obtain each year.

Ms. O'Sullivan stated that the field work will be followed by a draft SI report, expected in early 2018. She noted that comments from the EPA were received on 11 September, which indicated that the EPA does not agree with the QAPP. Ms. O'Sullivan stated that these comments will be addressed in the QAPP update, planned for submittal with the Draft SI Report, since the field work has already been conducted. Comments will also be addressed in the Draft SI Report.

Action Item 2: Ms. Constantinescu will try to locate an RWQCB environmental clearance letter for the FT005 landowner. 20 September 2017 update: Ms. Constantinescu located the RWQCB environmental clearance letter and provided it to Mr. Duke. No further information was necessary; this action item is closed.

Action Item 3: Mr. Wray will verify if Kettleman Landfill is an OSR-approved landfill. 20 September 2017 update: Mr. Wray verified that the Kettleman landfill is OSR-approved; this action item is closed.

Action Item 4: Mr. Duke will send email to FT005 landowner and copy the regulators regarding upcoming fieldwork on his property. 20 September 2017 update: Mr. Duke sent the RWQCB environmental clearance letter to the Site FT005 landowner, and field work is currently being conducted. This action item is closed.

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

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

Travis AFB Annual Meeting and Teleconference Schedule

The next RPM meeting will be held on Thursday, 19 October 2017, at 1400 hours. The meeting will be preceded by the annual Restoration Advisory Board (RAB) Tour, which will be held at 1000 hours. Ms. Constantinescu indicated she cannot attend the RAB tour. Dr. Haekyung Kim will attend both the RAB tour and the October RPM meeting.

Travis AFB Master Document Schedule

- Community Relations Plan (CRP): No change was made to the schedule. Mr. Anderson Noted that Ms. Dunphy (CH2M) provided her updates to the document and that Ms. Schilter-Lowe is working on a few additional changes. Upon completion of the draft document, the review order will start with the Wing Public Affairs (Travis AFB) for their approval, then to the AFCEC Public Affairs for their review and comment. A schedule for regulatory review will be provided at that time.
- Work Plan for the Fourth Five-year Review: The schedule was updated to indicate that comments on the Predraft were received from the AF/Service Center on 15 August 2017, and that the Draft was sent to the agencies and RAB on 23 August 2017. The rest of the dates were changed accordingly. Mr. Anderson indicated that the document was submitted early to allow additional review time for the agencies. This should allow the EPA to claim completion of this item on schedule in 2017. Mr. Anderson also noted that this was the first time they've prepared a Work Plan for a Five-Year Review, so we welcome comments.
- Amendment to the WABOU Soil ROD for Travis AFB ERP Sites DP039, SD043, and SS046: The date of Predraft submittal to the AF/Services Center was changed to 22 September 2017 to reflect the schedule of related risk assessments in the Data Gap

Investigation Results Technical Memorandum for Soil Sites SD033, SD043, and SS046. The rest of the dates were changed accordingly.

- Potrero Hills Annex (FS, PP, and ROD): No change was made to the schedule. Mr. Anderson noted that he will provide any applicable updates during the October RPM meeting; Ms. Constantinescu had no updates at this time.
- Data Gap Investigation Results Technical Memorandum for Soil Sites SD033, SD043, and SS046: The date that the Draft version to the Agencies and RAB was updated to 19 September 2017; the rest of the dates were changed accordingly. Mr. Anderson noted that the risk assessment included in this document will support the Amendment to the WABOU Soil ROD for Travis AFB ERP Sites DP039, SD043, and SS046; he would like to address comments on the risk assessment before addressing changes in the ROD. Ms. Burke noted that she will likely not be able to review within the usual 30 days and will likely request an extension. Mr. Anderson added that we can update the schedule of other documents that will be affected by updates to this Technical Memorandum. Mr. Wray noted that we need to keep moving on this document due to contract funding for Site SS046. Ms. Burke agreed to prioritize the review of this document to keep the schedule moving forward.
- Data Gap Investigation Results Technical Memorandum for Soil Site SS016: Predraft to AF/Service Center date changed to 9 October 2017; the rest of the dates were changed accordingly.
- Site FT004 POCO Soil Data Gap Investigation Work Plan: This document has been moved to History.
- Quarterly Newsletters (October 2017): No change was made to the schedule. Mr. Anderson noted that the newsletter is expected to be published on time.
- 2016 Annual GRISR: No change was made to the schedule. Mr. Ben Fries noted that DTSC had no comments and will confirm that he sent an email indicating concurrence. Ms. Burke offered a call to discuss and resolve any significant comments ahead of the Air Force submitting their written responses to comments.
- 2016 Annual CAMU Monitoring Report: The Response to Comment due date was changed to 20 September 2017. Mr. Fries noted that they had no further comment on responses provided to DTSC, and will provide confirmation of approval. Ms. Constantinescu noted that she had not received Mr. Anderson's email with responses to comments; Mr. Anderson noted that it was sent on 5 September 2017 but will resend, adding that the document will be finalized once all responses to comments are approved. Ms. Burke said that EPA would not be reviewing this document.
- Site TS060 Removal Action Completion Report: This is a new document with a new schedule.
- Site SD034 Technology Demonstration Construction Completion Report: This document has been moved to History.

- POCO Evaluation/Closure Report for DERA-funded Oil/Water Separators OW051, OW053, and OW054: Response to Comments and Final Due dates were changed to 29 September 2017.
- POCO Evaluation/Closure Report for DERA-funded Oil/Water Separators OW040, OW047, OW048, OW049, OW052, OW050, OW052, OW055, OW056, and OW057. Draft to Agencies date changed to 25 October 2017; the rest of the dates were changed accordingly. Mr. Anderson noted that once finalized, this document will be used as a template for future closure reports.
- Site ST032 POCO Well Decommissioning and Site Closeout Technical Memorandum: Draft to Agencies was changed to 30 August 2017 based on actual submittal date. Agency comments are now due on 2 October 2017; the remainder of the dates were not changed.

2. CURRENT PROJECTS

Treatment Plant Operation and Maintenance Update

South Base Boundary Groundwater Treatment Plant, August 2017 (see Attachment 3)

The South Base Boundary Groundwater Treatment Plant (SBBGWTP) performed at 100% uptime, and 4.8 million gallons of groundwater were extracted and treated in August 2017. All treated water was discharged to Union Creek. The average flow rate for the SBBGWTP was 111.9 gallons per minute (gpm). Electrical power usage was 13,861 kWh, and approximately 11,057 pounds of CO₂ were created (based on DOE calculation). Approximately 0.76 pounds of volatile organic compounds (VOCs) was removed in August. The total mass of VOCs removed since startup of the system is 489.3 pounds.

Optimization Activities for SBBGWTP: No optimization activities are reported for the month of August 2017.

Note: The SS030 extraction wells were shut down for aquifer testing on 12 August 2017; the system was restarted on 17 August. Troubleshooting was also performed on several extraction wells. Mr. Wray also noted that the off-base wells at Site FT005 will be rewired.

Central Groundwater Treatment Plant, August 2017 (see Attachment 4)

The Central Groundwater Treatment Plant (CGWTP) performed at 89.8% uptime with approximately 1,367,346 gallons of groundwater extracted and treated in August 2017. All treated water was discharged to the storm sewer system which discharges to Union Creek. The average flow rate for the CGWTP was 34.6 gpm. Electrical power usage was 2,212 kWh for all equipment connected to the Central Plant, and approximately

2,525 pounds of CO₂ were generated. Approximately 2.24 pounds of VOCs were removed from groundwater by the treatment plant in August. The total mass of VOCs removed since the startup of the system is 11,471 pounds.

Optimization Activities for CGWTP: The Site DP039 bioreactor was transitioned to a pulsed operation in various operating times; with the best Total Organic Carbon (TOC) distribution results surrounding the bioreactor obtained during the four-week operating schedule. The Site DP039 bioreactor will continue to run in a four-week pulsed mode cycle.

Ms. Burke asked if there was any concern regarding the J-flagged vinyl chloride detections in the influent. Mr. Wray responded that they do monitor the effluent, which currently shows non-detect results. He added that they would check the date of the last carbon filter change out, and consider changing it again if needed to keep the effluent clean.

LF007C Groundwater Treatment Plant, August 2017 (see Attachment 5)

The Subarea LF007C Groundwater Treatment Plant (LF007C GWTP) performed at 100% uptime with approximately 185,955 gallons of groundwater extracted and treated in August 2017. All treated water was discharged to the Duck Pond for beneficial reuse. The average flow rate was 4.3 gpm. This plant operates on solar power only. Approximately 1.80×10^{-3} pound of VOCs were removed from groundwater by the treatment plant in August. The total mass of VOCs removed since the startup of the system is 174.38 pounds.

Optimization Activities for LF007C GWTP: No optimization activities are reported for the month of August 2017.

Note: There was an unexpected detection of TPH-MO exceeding the trigger value in the effluent in August 2017. The LF007C GWTP was taken offline as a precaution. Confirmation samples will be collected in September 2017 in accordance with the current NPDES permit. Mr. Wray noted that while influent samples will be collected as part of the confirmation sampling effort, results will be presented in the September 2017 Monthly Data Sheet. The system will remain offline pending confirmation sampling results.

ST018 Groundwater (MTBE) Treatment Plant, August 2017 (see Attachment 6)

Site ST018 (MTBE) Treatment Plant (ST018 GWTP) performed at 100% uptime with approximately 257,020 gallons of groundwater extracted and treated in August 2017. All treated water was discharged to the Fairfield – Suisun Sewer District. The average flow rate for the ST018 GWTP was 5.9 gpm. Electrical power usage for the month was 143 kWh for all equipment connected to the ST018 GWTP. The total CO₂ equivalent, including an estimate for the carbon change-out, equates to approximately 106 pounds.

Approximately 0.36 pound of BTEX, MTBE and TPH was removed in August by the treatment plant, and approximately 0.15 pound of MTBE was removed from groundwater. The total BTEX, MTBE and TPH mass removed since the startup of the system is 42.2 pounds, and the total MTBE mass removed since startup of the system is 10.5 pounds.

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

Optimization Activities for ST018 GWTP: No optimization activities to report for the month of August 2017.

Ms. Constantinescu inquired if any additional thought was given to her suggestion for a pulsed mode study. Mr. Wray replied that they are evaluating the best way to maximize MTBE removal. Mr. Jeff Gamlin confirmed that they are planning a two-week and four-week pulsed mode study, but need to ensure that there will be no operation and maintenance issues, operation must be manual, and the proper personnel are needed. Mr. Wray added that they will not pulse the furthest downgradient well. Additional information will be provided during the October RPM meeting.

3. Presentations:

A) Triad Update for Site FT005 (See Attachment 7)

Mr. Chakurian provided a Triad update on the Site FT005 (off-base) hydropunch results. See Attachment 7 for details. The purpose of conducting this hydropunch investigation was to locate new extraction wells in the northern portion of FT005 off-base. Highlights of the presentation include:

Mr. Chakurian presented a figure that shows the 2016 1,2-DCA distribution in groundwater. Hydropunch samples have been collected from three locations (HP2779, HP2780, and HP2781). Samples were attempted at three depths at each location: at the groundwater table surface, at the bedrock-alluvium contact, and midway between those two depths.

In the northernmost location, they were unable to obtain a sample from the groundwater table surface at 15 feet bgs, but had a small J-flagged detection (0.53 ug/L J) of 1,2-DCA just above the MCL at the mid-depth sample from 34 feet bgs. The sample from the bedrock depth was non-detect.

One of the southern hydropunch locations is near MW766, this is HP2781. There have been historical detections in this location. The detection at first groundwater (0.17 ug/L) was below the MCL (0.5 ug/L), the detection at 34 feet bgs (5.2 ug/L) was higher than the MCL. The detection at the bedrock was 2.5 ug/L.

The hydropunch HP2780 was taken slightly to the west. The first groundwater sample was non-detect, the detection at 38 feet bgs was 4.3 ug/L, and the detection at bedrock was 2.2 ug/L.

Based on these data plus data from nearby monitoring wells, the northernmost three extraction wells (EW2782x05, EW2783x05, and EW2784x05) will be placed where the red dots are on the figure provided. Two extraction wells (EW2785x05 and EW2786x05) are planned more to the south, also indicated by red dots, in areas where historically monitoring well and extraction well concentrations have been above the MCL. Existing extraction wells that remain in operation are shown on the figure by black dots surrounded by red outline. The two new southern extraction wells will be installed first, followed by the three northern wells.

Mr. Gamlin added that the observed results are consistent with what we expected to find after completion of the aquifer test. It was thought that there was a pocket of 1,2-DCA just outside of the capture zone, which was confirmed and delineated based on the hydropunch results, so we are confident that the additional extraction wells are placed appropriately.

Ms. Burke asked if the entire alluvium is screened, and how thick the alluvium layer is. Mr. Chakurian responded that the entire alluvium is screened, and the resulting well screens are approximately 50-60 feet. Ms. Burke asked if this is better than screening a target layer; Mr. Chakurian replied that it is, because the sand lenses in the alluvium are discontinuous.

Ms. Burke also inquired if the extraction wells are being placed in their originally proposed locations; Mr. Chakurian replied that they are, noting that well EW2784x05 is not as close to monitoring well MW766x05 as originally proposed, it is closer to the location of hydropunches HP2780 and HP2781 due to the high concentration detected. This location will generate a strong cone of depression.

Ms. Constantinescu asked about the well screen length for the existing extraction wells. Mr. Chakurian replied that the entire saturated zone is screened in the existing wells to bedrock; noting that some of the older extraction wells may not be set at the bedrock interface, but all of the newer ones are or will be. Mr. Duke asked what the yield is in these wells. Mr. Chakurian replied that some do not yield much groundwater at all, whereas others in close proximity have thick sand layers and therefore a good yield. He noted that this is an indication of the variability in the lithology across the site. Mr. Duke and Mr. Chakurian discussed that the yield in off-base wells, particularly to the south, is generally better than on-base.

Ms. Burke inquired about getting a professional stratigrapher to map the lithology at the site. Mr. Chakurian responded that the site is not mappable because these discontinuous sand layers occur at a finer resolution than is able to be mapped. Ms. Constantinescu agreed that knowing the stratigraphy is important in the design of the remedial investigation, particularly how deep to set well screens at different locations, but added that in this case, we already have deeper and older extraction wells. Mr. Gamlin added that the older system did a good job, and we are dealing with a very low MCL. The optimization effort was to find that little pocket where concentrations exceed the MCL. Now that we have found it, we are optimistic that we can fully remediate the site more quickly and efficiently.

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

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

4. New Action Item Review

No new action items were identified during the September RPM Teleconference.

5. PROGRAM/ISSUES/UPDATE

Dr. Haekyung Kim, Mr. Hall's replacement, will be attending the October RPM Meeting as well as the RAB Tour.

Mr. Fries reported that he is being trained on the Department of Defense - State Memorandum of Agreement (DSMOA), which needs to be completed by 28 September 2017. He noted that he will be responsible for multiple sites of varying complexity, Travis AFB being the most complex.

6. Action Items

Item #	Responsible	Action Item Description	Due Date	Status
1.	Monika O'Sullivan	Ms. O'Sullivan to provide updates on PFOS and PFOA as she becomes aware of them.	Ongoing	Open

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

The RPM Teleconference is scheduled for 9:30 AM PST on 20 September 2017. **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. TRIAD UPDATE (SITE FT005)
- 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.

(2017)
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.)
—	01-18-17	—
02-15-17	—	—
—	03-15-17	—
04-20-17 (Thursday 2:00 PM)	—	04-20-17
—	05-17-17	—
06-21-17	—	—
—	07-19-17	—
08-16-17	—	—
—	09-20-17	—
10-19-17 (Thursday 2:00 PM)	—	10-19-17 ²
—	11-15-17	—
—	—	—

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 date in lieu of RAB meeting.

(2018)
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.)
—	01-17-18	—
02-21-18	—	—
—	03-21-18	—
04-19-18 (Thursday 2:00 PM)	—	04-19-18
—	05-16-18	—
06-20-18	—	—
—	07-18-18	—
08-15-18	—	—
—	09-19-18	—
10-18-18 (Thursday 2:00 PM)	—	10-18-18 ²
—	11-21-18	—
—	—	—

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

² Note: Tentative RAB tour date in lieu of RAB meeting.

Travis AFB Master Meeting and Document Schedule

PRIMARY DOCUMENTS			
Life Cycle	Community Relations Plan Travis AFB, Glenn Anderson CH2M, Jill Dunphy	Work Plan for the Fourth Five-year Review Travis AFB, Glenn Anderson Tetrattech, Joachim Eberharter	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	06-02-17	NA
Predraft to AF/Service Center	08-23-16	08-01-17	09-22-17
AF/Service Center Comments Due	09-07-16	08-15-17	10-23-17
Draft to Agencies	09-28-16	08-23-17	11-07-17
Draft to RAB	09-28-16	08-23-17	11-07-17
Agency Comments Due	10-28-16 (11-28-16)	09-28-17	01-10-18
Response to Comments Meeting	TBD	10-18-17	01-17-18
Agency Concurrence with Remedy	NA	NA	NA
Public Comment Period	NA	NA	NA
Public Meeting	NA	NA	NA
Response to Comments Due	TBD	10-31-17	01-31-18
Draft Final Due	TBD	10-31-17	01-31-18
Final Due	TBD	11-30-17	03-05-18

Travis AFB Master Meeting and Document Schedule

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

Travis AFB Master Meeting and Document Schedule

SECONDARY DOCUMENTS		
Life Cycle	Data Gap Investigation Results Technical Memorandum for Soil Sites SD033, SD043, and SS046 Travis AFB, Glenn Anderson CH2M, Leslie Royer	Data Gap Investigation Results Technical Memorandum for Soil Site SS016 Travis AFB, Glenn Anderson CH2M, Doug Berwick CAPE, Meg Greenwald
Scoping Meeting	NA	NA
Predraft to AF/Service Center	07-26-17	10-09-17
AF/Service Center Comments Due	08-09-17	10-23-17
Draft to Agencies	09-19-17	11-08-17
Draft to RAB	09-19-17	11-08-17
Agency Comments Due	10-19-17	12-11-17
Response to Comments Meeting	11-15-17	01-17-18
Response to Comments Due	12-05-17	02-02-18
Draft Final Due	NA	NA
Final Due	12-05-17	02-02-18
Public Comment Period	NA	NA
Public Meeting	NA	NA

Travis AFB Master Meeting and Document Schedule

INFORMATIONAL DOCUMENTS		
Life Cycle	Quarterly Newsletters (October 2017) Travis, Glenn Anderson	2016 Annual GRISR Travis AFB, Glenn Anderson CH2M, Leslie Royer
Scoping Meeting	NA	NA
Predraft to AF/Service Center	NA	04-21-17
AF/Service Center Comments Due	NA	05-22-17
Draft to Agencies	09-22-17	06-07-17
Draft to RAB	NA	06-07-17
Agency Comments Due	10-06-17	08-10-17 (08-24-17)
Response to Comments Meeting	TBD	08-16-17 (09-20-17)
Response to Comments Due	10-10-17	09-01-17 (10-06-17)
Draft Final Due	NA	NA
Final Due	10-12-17	09-01-17 (10-06-17)
Public Comment Period	NA	NA
Public Meeting	NA	NA

Travis AFB Master Meeting and Document Schedule

INFORMATIONAL DOCUMENTS		
Life Cycle	2016 Annual CAMU Monitoring Report Travis AFB, Glenn Anderson CH2M, Levi Pratt	Site TS060 Removal Action Completion Report Travis AFB, Glenn Anderson CH2M, Doug Berwick CAPE, Meg Greenwald
Scoping Meeting	NA	NA
Predraft to AF/Service Center	02-09-17	10-27-17
AF/Service Center Comments Due	02-24-17	11-10-17
Draft to Agencies	06-30-17	11-29-17
Draft to RAB	06-30-17	11-29-17
Agency Comments Due	07-31-17	01-03-18
Response to Comments Meeting	08-16-17	01-17-18
Response to Comments Due	09-20-17	02-05-18
Draft Final Due	NA	NA
Final Due	09-20-17	02-05-18
Public Comment Period	NA	NA
Public Meeting	NA	NA

Travis AFB Master Meeting and Document Schedule

INFORMATIONAL POCO DOCUMENTS			
Life Cycle	POCO Evaluation/Closure Report for DERA-funded Oil/Water Separators OW051, OW053, and OW054 Travis AFB, Glenn Anderson CH2M, Doug Berwick	POCO Evaluation/Closure Report for DERA-funded Oil/Water Separators OW040, OW047, OW048, OW049, OW050, OW052, OW055, OW056, and OW057 Travis AFB, Glenn Anderson CH2M, Doug Berwick	Site ST032 POCO Well Decommissioning and Site Closeout Technical Memorandum Travis AFB, Glenn Anderson CH2M, Doug Berwick CAPE, Meg Greenwald
Scoping Meeting	NA	NA	NA
Predraft to AF/Service Center	11-07-16	02-01-17	04-25-17
AF/Service Center Comments Due	11-21-16	02-15-17	05-09-17
Draft to Agencies	01-19-17	10-25-17	08-30-17
Draft to RAB	01-19-17	10-25-17	08-30-17
Agency Comments Due	02-21-17	11-27-17	10-02-17
Response to Comments Meeting	03-15-17	12-05-17	10-19-17
Response to Comments Due	09-29-17	12-19-17	11-08-17
Draft Final Due	NA	NA	NA
Final Due	09-29-17	12-19-17	11-08-17
Public Comment Period	NA	NA	NA
Public Meeting	NA	NA	NA

Travis AFB Master Meeting and Document Schedule

HISTORY		
Life Cycle	Site FT004 POCO Soil Data Gap Investigation Work Plan Travis AFB, Glenn Anderson CH2M, Doug Berwick CAPE, Meg Greenwald	Site SD034 Technology Demonstration Construction Completion Report Travis AFB, Glenn Anderson CH2M, Levi Pratt
Scoping Meeting	NA	NA
Predraft to AF/Service Center	06-03-16	03-23-17
AF/Service Center Comments Due	06-17-16	04-06-17
Draft to Agencies	07-19-16	05-02-17
Draft to RAB	07-19-16	05-02-17
Agency Comments Due	08-19-16	06-02-17
Response to Comments Meeting	09-21-16	06-21-17 (07-19-17)
Response to Comments Due	10-06-16 (08-03-17)	07-06-17 (08-11-17)
Draft Final Due	NA	NA
Final Due	10-06-16 (08-03-17)	07-06-17 (08-11-17)
Public Comment Period	NA	NA
Public Meeting	NA	NA

South Base Boundary Groundwater Treatment Plant

Monthly Data Sheet

Report Number: 202

Reporting Period: 1 August 2017 – 31 August 2017

Date Submitted: 14 September 2017

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 August 2017 reporting period.

Table 1 – Operations Summary – August 2017				
Initial Data Collection:		8/1/2017 12:35	Final Data Collection:	8/31/2017 14:00
Operating Time:		Percent Uptime:		Electrical Power Usage:
SBBGWTP:	721 hours	SBBGWTP:	100%	SBBGWTP: 13,861 kWh (11,057 lbs CO ₂ generated ^a)
Gallons Treated: 4.8 million gallons		Gallons Treated Since July 1998: 987 million gallons		
Volume Discharged to Union Creek: 4.8 million gallons		Gallons Treated From Other Sources: 3,518 gallons		
VOC Mass Removed: 0.76 lbs ^b		VOC Mass Removed Since July 1998: 489.3 lbs		
Rolling 12-Month Cost per Pound of Mass Removed: \$15,523 ^c				
Monthly Cost per Pound of Mass Removed: \$10,341 ^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.				
^b Calculated using August 2017 EPA Method SW8260C analytical results.				
^c Costs include operations and maintenance, reporting, analytical laboratory, project management, and utility costs related to operation of the system.				

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

Table 2 – SBBGWTP Average Flow Rate (gpm) ^a – August 2017							
FT005 ^b				SS029		SS030	
EW01x05	Offline	EW736x05	Offline	EW01x29	1.9	EW01x30	13.1
EW02x05	Offline	EW737x05	Offline	EW02x29	2.0	EW02x30	5.4
EW03x05	Offline	EW742x05	Offline	EW03x29	3.1	EW03x30	16.5
EW731x05	5.1	EW743x05	5.5	EW04x29	Offline ^c	EW04x30	23.6
EW732x05	Offline	EW744x05	0.0 ^d	EW05x29	0.0 ^d	EW05x30	16.9
EW733x05	Offline	EW745x05	Offline ^c	EW06x29	Offline ^c	EW2174x30	8.6
EW734x05	3.3	EW746x05	Offline	EW07x29	12.9	EW711x30	0.0 ^d
EW735x05	13.6	EW2291x05	7.4				
FT005 Total: 34.9				SS029 Total: 19.9		SS030 Total: 84.1	
SBBGWTP Average Monthly Flow ^e : 111.9 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 These extraction wells are offline due to pump or other malfunction.							
^d The well was recharging (not pumping) when the flow rate was being measured.							
^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.	--		--	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

Analytical data from the 1 August 2017 sampling event are presented in Table 4. The total VOC concentration (18.78 µg/L) in the influent sample has decreased slightly from the July 2017 sample results (22.48 µg/L). TCE (17.3 µg/L), cis-1,2-DCE (1.05 µg/L), 1,2-DCA (0.20 µg/L), and chloroform (0.23 µg/L) were detected in the influent sampling location. Several VOCs were detected in the midpoint sampling location at trace concentrations, including cis-1,2-DCE, 1,2-DCA, and chloroform. No VOCs were detected at the effluent sampling location, with the exception of acetone, which is a common laboratory contaminant and not likely a chemical of concern.

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

On 12 August, the SS030 extraction wells were shut down for the aquifer testing. Following the conclusion of the aquifer test, the system was restarted on 17 August. The FT005 and SS029 extraction wells remained operational during the SS030 aquifer test.

In August 2017, troubleshooting was performed on several Site FT005, SS029, and SS030 extraction wells. The following list presents the maintenance activities and status of several extraction wells:

- EW731x05 – Water level is not being reported; however, well is currently operating.
- EW735x05 - Pump shuts off because of low flow. Additional troubleshooting required. Well is currently off line and will be brought back on line in September 2017.
- EW743x05 – Water level is not being reported; however, well is currently operating.
- EW745x05 – Replaced flow meter. Pump shuts off because of low flow. Additional troubleshooting required. Well is currently off line and will be brought back on line in September 2017.
- EW01x29 – Pump was removed to troubleshoot the pump failure. A section of the wiring was replaced, and the pump was reinstalled. Well is currently operating.
- EW04x29 – The variable-frequency drive (VFD) was bypassed because it was malfunctioning. The corroded piping was replaced. Well is currently off line and will be brought back on line in early September 2017.
- EW06x29 – Pump was removed and cleaned. Pump and VFD requires additional troubleshooting. Well is currently on line and will be brought back off line in early September 2017.
- EW02x30 - Replaced level transducer. Well is currently operating.

Optimization Activities

No optimization activities occurred at the SBBGWTP in August 2017.

Sustainability

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

Figure 2 presents the historical GHG production from the SBBGWTP. In August 2017, the SBBGWTP produced approximately 11,057 pounds of GHG, which includes approximately 800 pounds of GHG generated from changing out the GAC.

TABLE 4

Summary of Groundwater Analytical Data For August 2017 – South Base Boundary Groundwater Treatment Plant

Constituent	Instantaneous Maximum* (µg/L)	Detection Limit (µg/L)	N/C	1 August 2017 (µg/L)		
				Influent	Midpoint	Effluent
Halogenated Volatile Organics						
Acetone	NA	1.0	0	ND	ND	1.36 J
Bromodichloromethane	NA	0.15	0	ND	ND	ND
Carbon Tetrachloride	0.5	0.15	0	ND	ND	ND
Chloroform	5.0	0.15	0	0.23 J	0.28 J	ND
Chloromethane	NA	0.15	0	ND	ND	ND
1,1-Dichloroethane	5.0	0.15	0	ND	ND	ND
1,2-Dichloroethane	0.5	0.15	0	0.20 J	0.18 J	ND
1,1-Dichloroethene	5.0	0.15	0	ND	ND	ND
cis-1,2-Dichloroethene	5.0	0.15	0	1.05	0.88	ND
trans-1,2-Dichloroethene	5.0	0.15	0	ND	ND	ND
Methylene Chloride	5.0	0.15	0	ND	ND	ND
Tetrachloroethene	5.0	0.15	0	ND	ND	ND
1,1,1-Trichloroethane	5.0	0.15	0	ND	ND	ND
1,1,2-Trichloroethane	5.0	0.15	0	ND	ND	ND
Trichloroethene	5.0	0.15	0	17.3	ND	ND
Vinyl Chloride	0.5	0.15	0	ND	ND	ND
Non-Halogenated Volatile Organics						
Benzene	1.0	0.15	0	ND	ND	ND
Ethylbenzene	5.0	0.15	0	ND	ND	ND
Toluene	5.0	0.15	0	ND	ND	ND
Xylenes	5.0	0.15 – 0.30	0	ND	ND	ND
Other						
Total Petroleum Hydrocarbons – Gasoline	50	35	0	NM	NM	ND
Total Petroleum Hydrocarbons – Diesel	50	24	0	NM	NM	ND
Total Petroleum Hydrocarbons – Motor Oil	50 (trigger)	24	0	NM	NM	ND

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

Notes:

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

mg/L = milligrams per liter

NA = not applicable

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

ND = not detected

NM = not measured

µg/L = micrograms per liter

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

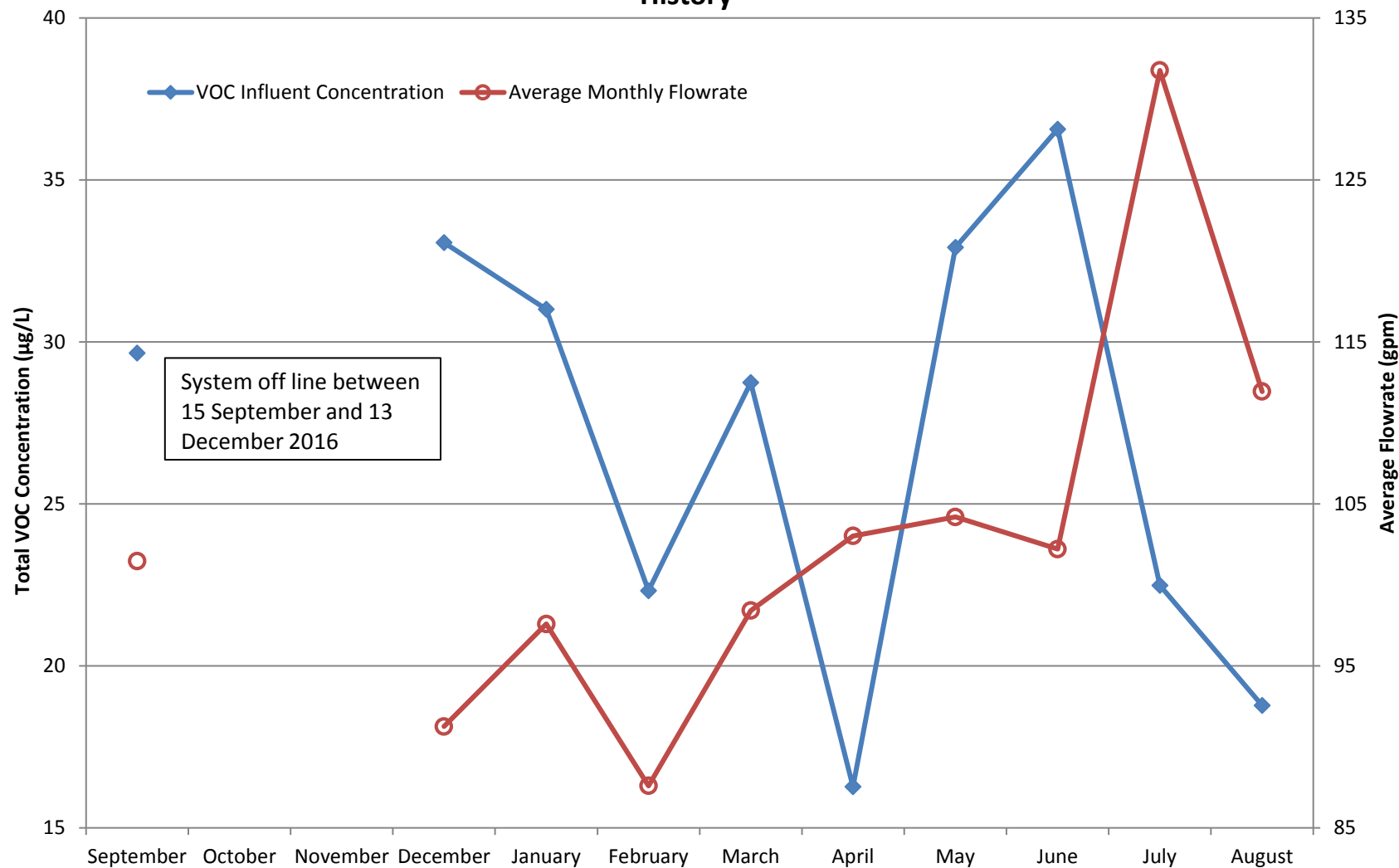
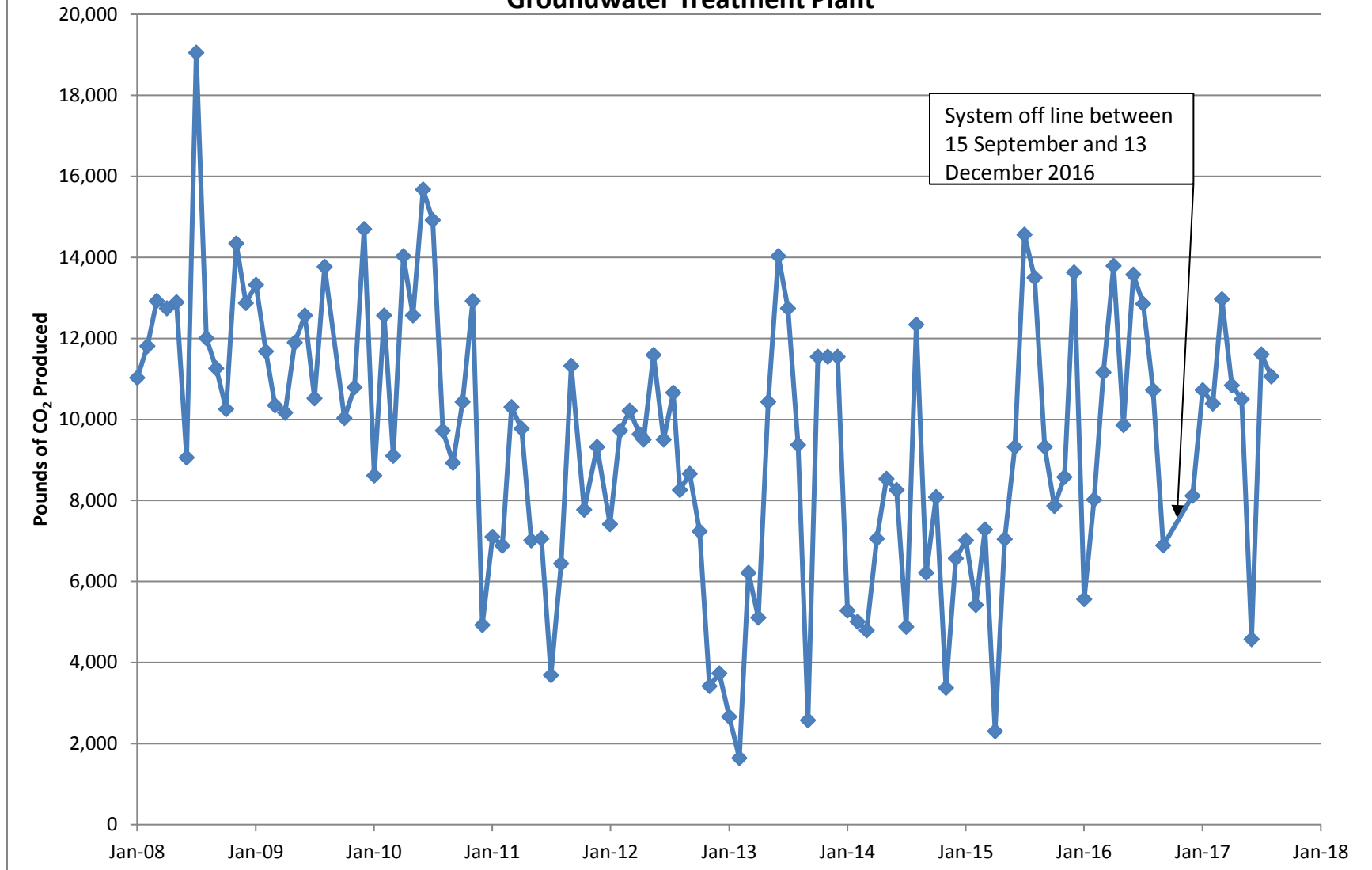


Figure 2

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



Central Groundwater Treatment Plant Monthly Data Sheet

Report Number: 217

Reporting Period: 1 August 2017 – 31 August 2017

Date Submitted: 14 September 2017

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 August 2017 reporting period.

Table 1 – Operations Summary – August 2017					
Initial Data Collection:		8/1/2017 08:00	Final Data Collection:	8/31/2017 12:10	
Operating Time:		Percent Uptime:	Electrical Power Usage:		
CGWTP:	650 hours	CGWTP:	89.8%	CGWTP:	2,212 kWh (2,525 lbs CO ₂ generated ^a)
Gallons Treated (discharge to storm sewer):		Gallons Treated Since January 1996: 544.3 million gallons			
1,367,346 gallons^b					
VOC Mass Removed from groundwater:		VOC Mass Removed Since January 1996:			
2.24 lbs^c		2,785 lbs from groundwater			
		8,686 lbs from vapor			
Rolling 12-Month Cost per Pound of Mass Removed: \$2,169 ^d					
Monthly Cost per Pound of Mass Removed: \$1,606 ^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.					
b Volume includes approximately 26 gallons from the Q3 GRIP sampling event and 17,500 gallons from the Site SD031 aquifer test.					
c Calculated using August 2017 EPA Method SW8260C analytical results.					
d Costs include operations and maintenance, reporting, analytical laboratory, project management, and utility costs related to operation of the system.					

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

Table 2 – CGWTP Average Flow Rates ^a – August 2017	
Location	Average Flow Rate Groundwater (gpm)
EW001x16	14.5
EW002x16	11.2
EW003x16	Off line
EW605x16	6.4
EW610x16	2.8
CGWTP	34.6
^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	11 August 2017	15:52	14 August 2017	10:10	High sump alarm
	14 August 2017	12:43	14 August 2017	13:55	Reposition sump pump high float
	15 August 2017	12:57	15 August 2017	14:00	Maintenance on influent transfer pump
	24 August 2017	10:15	24 August 2017	11:05	Maintenance on influent transfer pump
	29 August 2017	10:10	29 August 2017	14:00	Maintenance on influent transfer pump
-- = Date/Time not recorded					
^a Shutdown and restart times estimated based on field notes					
CGWTP = Central Groundwater Treatment Plant					

Summary of O&M Activities

Monthly groundwater samples were collected at the CGWTP on 1 August 2017. Sample results are presented in Table 4. The total VOC concentration (198.75 µg/L) in the August 2017 influent sample has decreased from the July 2017 sample (231.12 µg/L). TCE was the primary VOC detected in the influent sample at a concentration of 163 µg/L. Cis-1,2-DCE (10.3 µg/L) and vinyl chloride (0.19 J µg/L) were detected in the sample collected after the first carbon vessel, and only vinyl chloride (0.22 J µg/L) was detected in the sample collected after the second carbon vessel. No VOC constituents were detected in the effluent sample. Acetone was detected in the influent and effluent samples; however, acetone is a common laboratory contaminant and not likely a chemical of concern. Travis AFB will continue to monitor influent, midpoint, and effluent concentrations at the CGWTP for carbon breakthrough, though the carbon treatment remained effective in August 2017.

In August, approximately 26 gallons of groundwater from the Q3 groundwater sampling event was disposed of at the CGWTP. In addition, approximately 17,500 gallons of groundwater from the Site SD031 aquifer test was disposed of at the CGWTP.

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. The overall flow rate through the treatment plant has increased slightly over the past 12 months.

Extraction well EW003x16 was off line in August because of low water level.

Between 11 and 14 August 2017, the CGWTP was shut down because of a high sump alarm. The sump pump high alarm float was repositioned and the system was restarted. Between 15 and 29 August, the CGWTP was manually shut down several times to install a new smaller and more energy efficient influent transfer pump and a shunt trip bypass. After each shutdown, the system was restarted without issue.

The Site DP039 subgrade biogeochemical reactor (SBGR), also known as a bioreactor, continued to operate in a “pulsed mode” in an effort to optimize distribution of total organic carbon (TOC). Following the effort to evaluate the optimum pulsing interval, the four-week pulsed mode operation began on 7 August 2017 with the bioreactor being turned off.

Optimization Activities

The Site DP039 bioreactor was transitioned to a four-week pulsed mode operation based on the results of field tests that began in 2016. Following baseline sample collection (VOCs and total organic carbon [TOC]), the Site DP039 bioreactor was first run on a one-week pulsed mode schedule (one week on, then off for one week, and on for another week). Samples were collected after the 1-week pulsed mode trial, and then taken off line for four weeks. The next trial was of a two-week operating time, followed by a four-week pulsed mode operation trial. Groundwater samples from surrounding wells were collected at the conclusion of each pulsed mode trial.

In reviewing the data collected after each pulsed mode trial, the four-week operating schedule showed the best results in terms of TOC distribution surrounding the bioreactor. Based on these results, the Site DP039 bioreactor will continue to run in a four-week pulsed mode cycle.

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.

In August, a new smaller and more energy efficient influent transfer pump was installed at the CGWTP.

Figure 2 presents the historical GHG production from the systems associated with the CGWTP. The CGWTP produced approximately 2,525 pounds of GHG during August 2017, which is a decrease from the July 2017 amount of 2,921 pounds.

TABLE 4

Summary of Groundwater Analytical Data for August 2017 – Central Groundwater Treatment Plant

				1 August 2017 (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	1.0	0	1.40 J	ND	ND	1.64 J
Carbon Tetrachloride	0.5	0.15	0	ND	ND	ND	ND
Chloroform	5.0	0.15	0	ND	ND	ND	ND
Chloromethane	NA	0.15	0	ND	ND	ND	ND
cis-1,2-Dichloroethene	5.0	0.15	0	30.7	10.3	ND	ND
1,2-Dichlorobenzene	5.0	0.15	0	0.27 J	ND	ND	ND
1,3-Dichlorobenzene	5.0	0.15	0	0.29 J	ND	ND	ND
1,4-Dichlorobenzene	5.0	0.15	0	ND	ND	ND	ND
1,1-Dichloroethane	5.0	0.15	0	ND	ND	ND	ND
1,2-Dichloroethane	0.5	0.15	0	ND	ND	ND	ND
1,1-Dichloroethene	5.0	0.15	0	0.47 J	ND	ND	ND
Methylene Chloride	5.0	0.15	0	ND	ND	ND	ND
Methyl tert-Butyl Ether	1.0	0.15	0	ND	ND	ND	ND
Tetrachloroethene	5.0	0.15	0	0.51	ND	ND	ND
1,1,1-Trichloroethane	5.0	0.15	0	ND	ND	ND	ND
1,1,2-Trichloroethane	5.0	0.15	0	ND	ND	ND	ND
trans-1,2-Dichloroethene	5.0	0.15	0	1.93	ND	ND	ND
Trichloroethene	5.0	0.15 – 1.5	0	163	ND	ND	ND
Vinyl Chloride	0.5	0.15	0	0.18 J	0.19 J	0.22 J	ND
Non-Halogenated Volatile Organics							
Benzene	1.0	0.15	0	ND	ND	ND	ND
Ethylbenzene	5.0	0.15	0	ND	ND	ND	ND
Toluene	5.0	0.15	0	ND	ND	ND	ND
Total Xylenes	5.0	0.15 – 0.30	0	ND	ND	ND	ND
Other							
Total Petroleum Hydrocarbons – Gasoline	50	35	0	NM	NM	NM	ND
Total Petroleum Hydrocarbons – Diesel	50	24	0	NM	NM	NM	ND
Total Petroleum Hydrocarbons – Motor Oil	50 (trigger)	24	0	NM	NM	NM	ND

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

Notes:

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

NA = not applicable

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

ND = not detected

NM = not measured

µg/L = micrograms per liter

mg/L = milligrams per liter

Table 5 presents a twelve month summary of the Site DP039 bioreactor recirculation well pulsing dates.

Table 5 – Summary of DP039 Bioreactor “Pulsed Mode” Operations		
Location	Pulse-on Date	Pulse-off Date
MW750x39	26 August 2016	8 September 2016
	10 October 2016	17 October 2016
	25 October 2016	2 November 2016
	29 November 2016	13 December 2016
	27 December 2016	10 January 2017
	7 February 2017	7 March 2017
	5 April 2017	7 August 2017
MW = Monitoring Well		

Figure 1

CGWTP Total VOC Influent Concentrations and Average Flowrate Twelve Month History

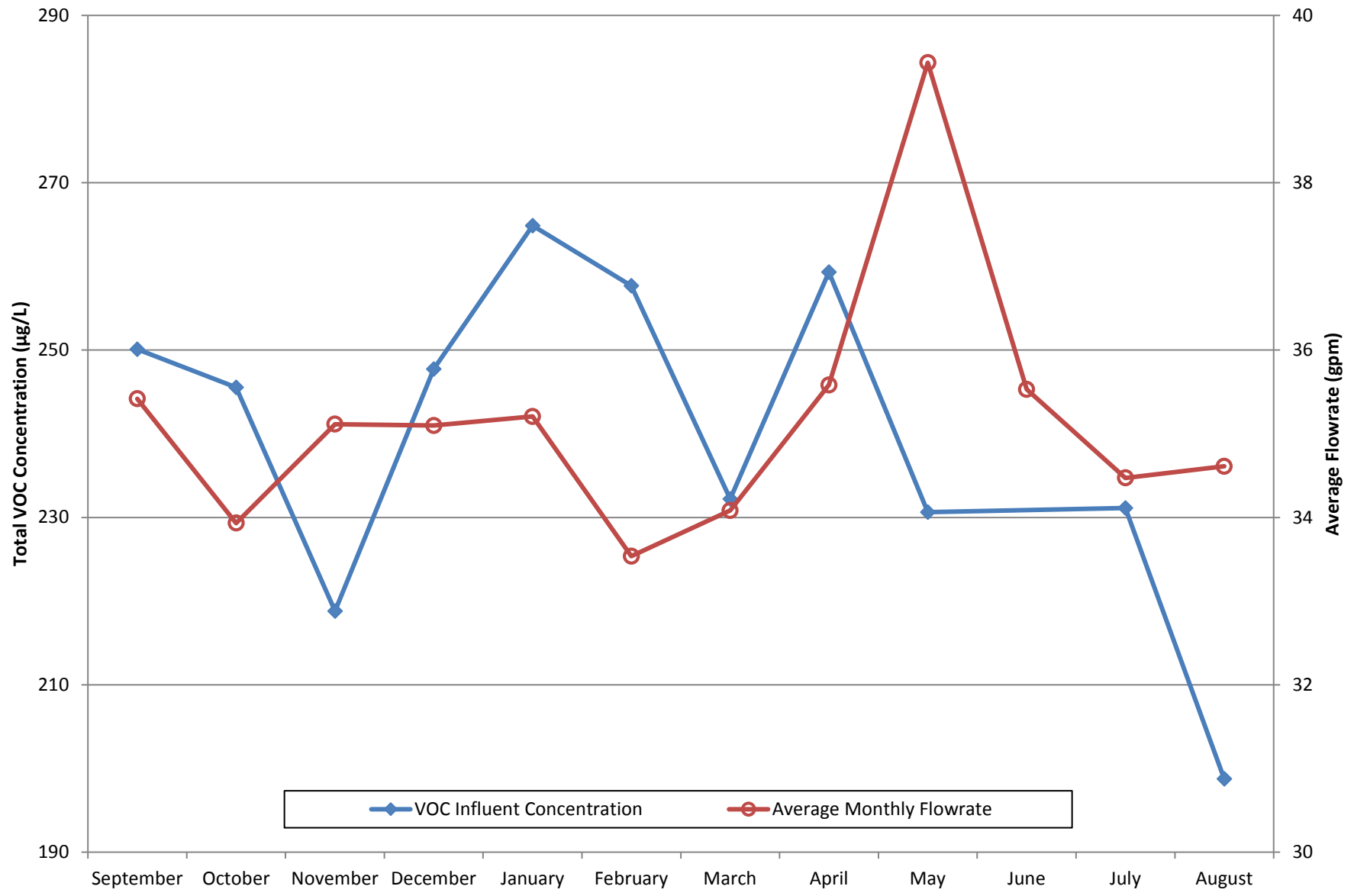
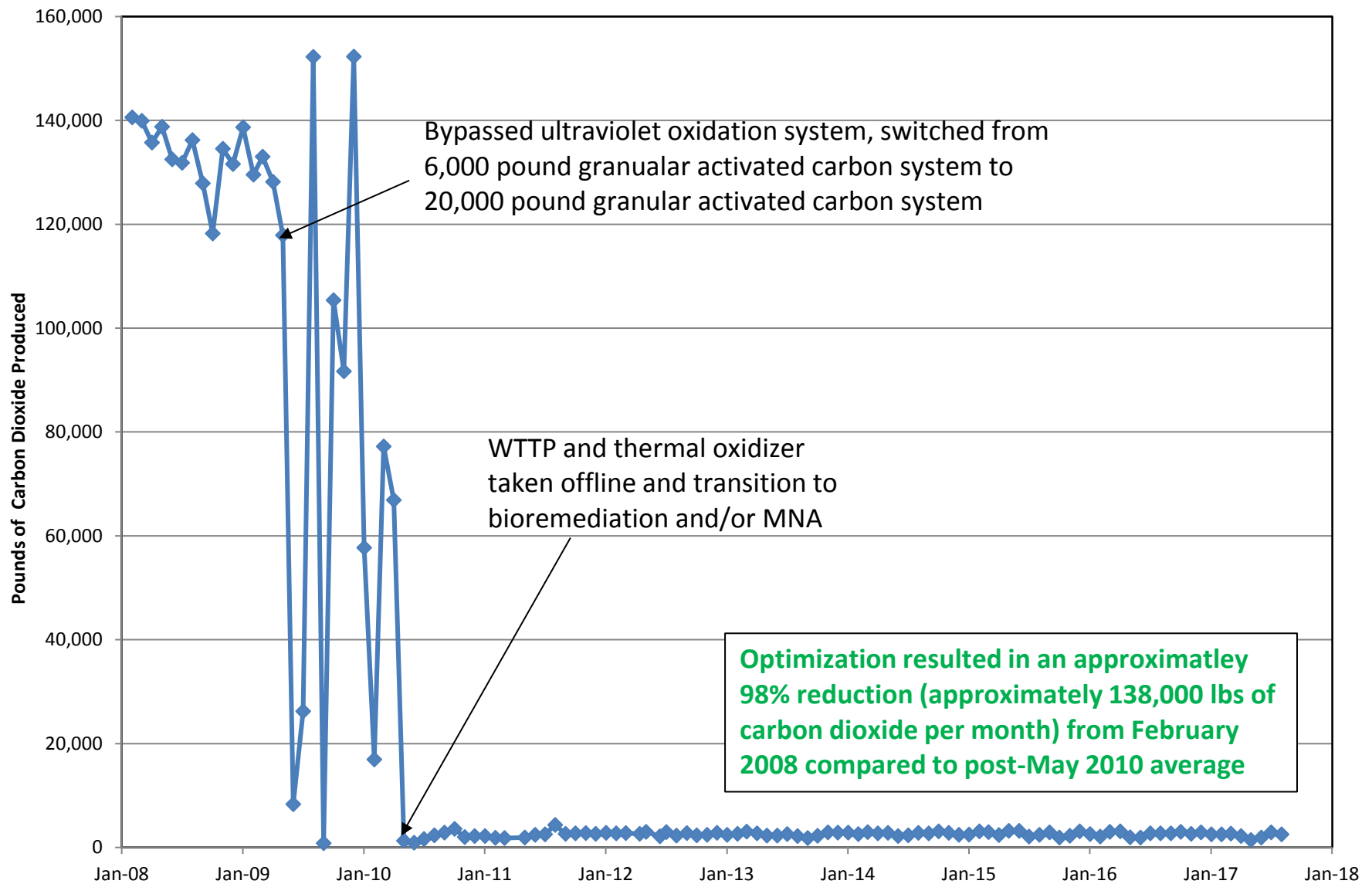


Figure 2

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



Subarea LF007C Groundwater Treatment Plant

Monthly Data Sheet

Report Number: 161

Reporting Period: 1 August 2017 – 31 August 2017

Date Submitted: 14 September 2017

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 August 2017 reporting period:

Table 1 – Operations Summary – August 2017				
Initial Data Collection:		8/1/2017 09:10	Final Data Collection:	8/31/2017 11:40
Operating Time:		Percent Uptime:		Electrical Power Usage ^a :
LF007C GWTP:	723 hours	LF007C GWTP	100%	LF007C GWTP: 0 kWh
Gallons Treated: 185,955 gallons		Gallons Treated Since March 2000: 86.4 million gallons		
Volume Discharged to Duck Pond: 185,955 gallons				
VOC Mass Removed: 1.80 x 10 ⁻³ pounds ^b		VOC Mass Removed Since March 2000: 174.38 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 August 2017 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 – July 2017		
Location	Average Flow Rate (gpm) ^a	Total Gallons Processed (gallons)
EW614x07	3.7	158,517
EW615x07	0.6	25,779
LF007C GWTP	4.3	185,955
^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.	--		--	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

The August 2017 analytical data are presented in Table 4. TCE (1.16 µg/L) was detected at the influent sample location. No VOC contaminants were detected at the midpoint and effluent sampling locations, with the exception of acetone, which is a common laboratory contaminant and not likely a chemical of concern. In addition, TPH-d (88.2 J µg/L) and TPH-mo (203 J- µg/L) were detected in the effluent sample. The concentration of TPH-d exceeded the maximum effluent concentration, while the TPH-mo concentration exceeded the trigger value. Based on these unexpected detections, the LF007C GWTP was taken off line. Additional (confirmation) samples from the influent and effluent sampling locations will be collected in September 2017 as directed in the current NPDES permit. Results from this confirmation sampling will be presented in the September 2017 Monthly Data Sheet. The LF007C GWTP will remain off line pending results from confirmation sampling.

Figure 1 presents a chart of influent concentrations (total VOCs) at the LF007C GWTP versus time for the past twelve months. VOC concentrations, primarily TCE, have been seasonally variable; however, over the last twelve months the trend has been increasing slightly. The average flow rate through the LF007C GWTP has increased since the low of 1.92 gpm in October 2016. The increase may be a result of the above average rainy season in 2016/2017.

Optimization Activities

No optimization activities occurred at the LF007C GWTP in August 2017.

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.

TABLE 4

Summary of Groundwater Analytical Data For August 2017 – Subarea LF007C Groundwater Treatment Plant

Constituent	Instantaneous Maximum* (µg/L)	Detection Limit (µg/L)	N/C	1 August 2017 (µg/L)		
				Influent	After Carbon 1	Effluent
Halogenated Volatile Organics						
Acetone	NA	0.50	0	ND	7.37	9.39
Bromodichloromethane	5.0	0.15	0	ND	ND	ND
Bromoform	5.0	0.15	0	ND	ND	ND
2-Butanone	5.0	2.0	0	ND	ND	ND
Carbon Tetrachloride	0.5	0.15	0	ND	ND	ND
Chloroform	5.0	0.15	0	ND	ND	ND
Dibromochloromethane	5.0	0.15	0	ND	ND	ND
1,3-Dichlorobenzene	5.0	0.15	0	ND	ND	ND
1,4-Dichlorobenzene	5.0	0.15	0	ND	ND	ND
1,1-Dichloroethane	5.0	0.15	0	ND	ND	ND
1,2-Dichloroethane	0.5	0.15	0	ND	ND	ND
1,1-Dichloroethene	5.0	0.15	0	ND	ND	ND
cis-1,2-Dichloroethene	5.0	0.15	0	ND	ND	ND
trans-1,2-Dichloroethene	5.0	0.15	0	ND	ND	ND
Methylene Chloride	5.0	0.15	0	ND	ND	ND
Tetrachloroethene	5.0	0.15	0	ND	ND	ND
1,1,1-Trichloroethane	5.0	0.15	0	ND	ND	ND
1,1,2-Trichloroethane	5.0	0.15	0	ND	ND	ND
Trichloroethene	5.0	0.15	0	1.16	ND	ND
Vinyl Chloride	0.5	0.15	0	ND	ND	ND
Non-Halogenated Volatile Organics						
Benzene	1.0	0.15	0	ND	ND	ND
Ethylbenzene	5.0	0.15	0	ND	ND	ND
Toluene	5.0	0.15	0	ND	ND	ND
Xylenes	5.0	0.15 – 0.30	0	ND	ND	ND
Other						
Total Petroleum Hydrocarbons – Gasoline	50	35	0	NM	NM	ND
Total Petroleum Hydrocarbons – Diesel	50	24	1	NM	NM	88.2 J **
Total Petroleum Hydrocarbons – Motor Oil	100	24	1	NM	NM	203 J- **

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

** Samples were recollected on 24 August 2017 and analyzed with silica gel cleanup.

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 and biased low

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

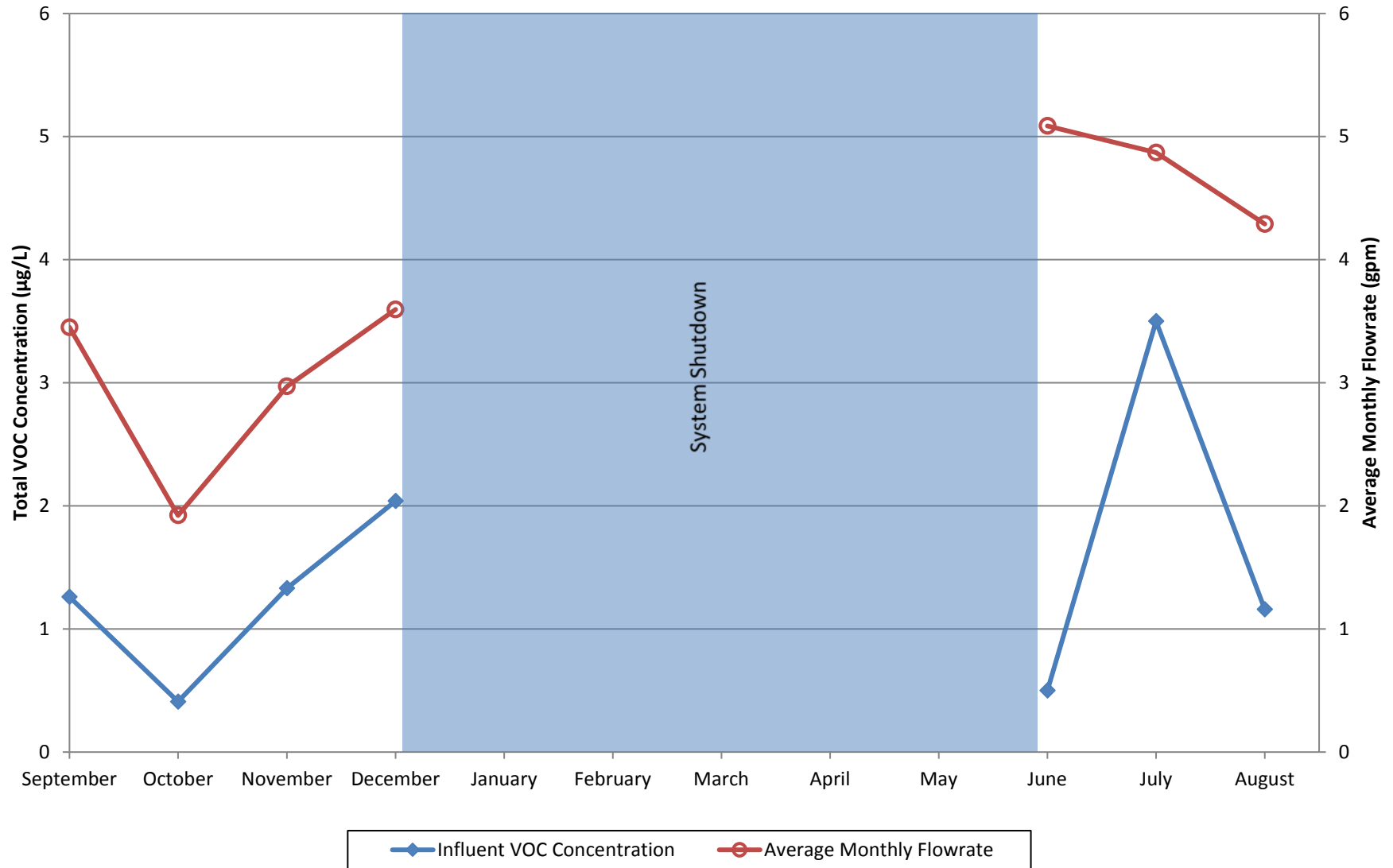
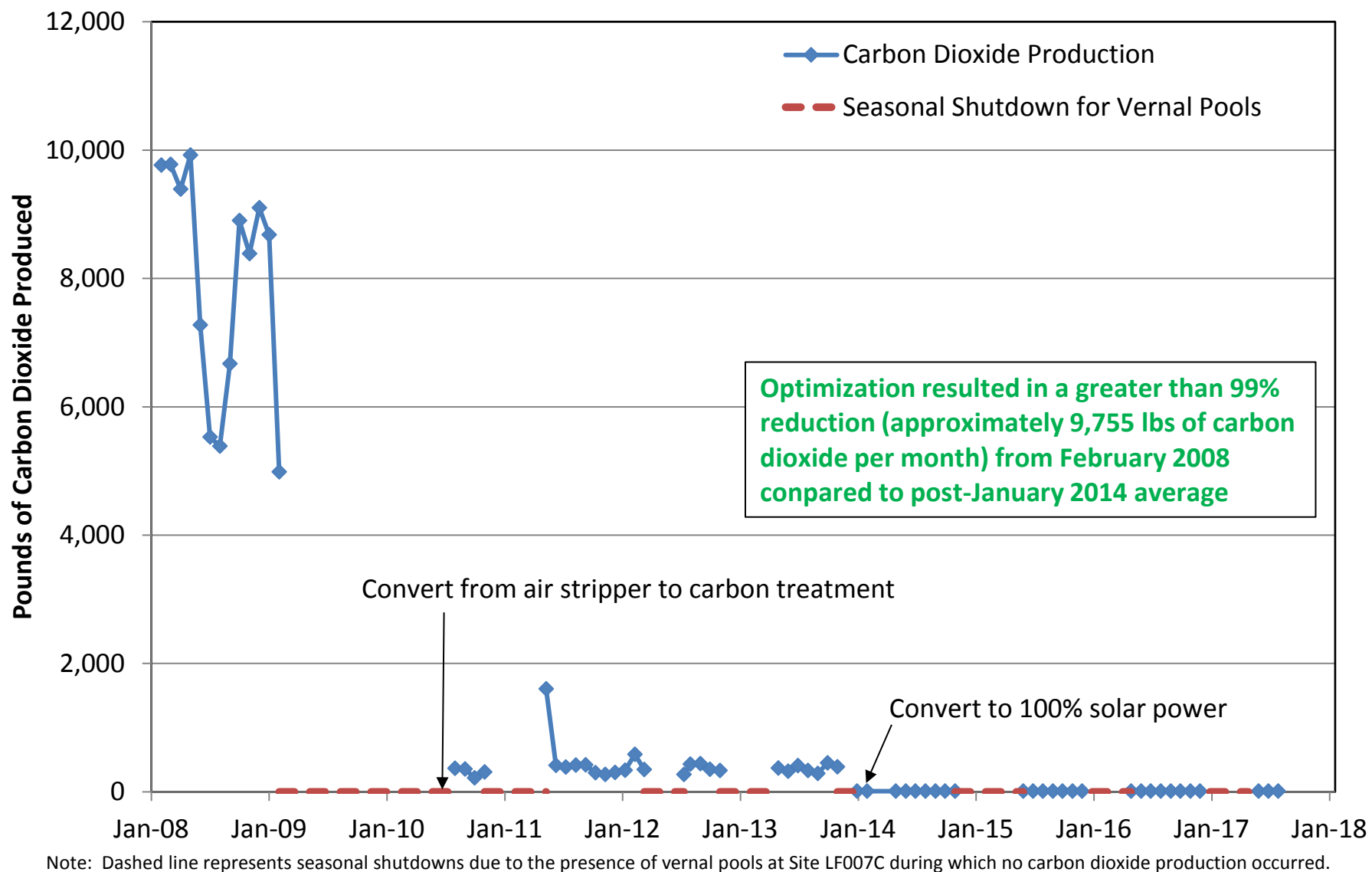


Figure 2
Equivalent Pounds of Carbon Dioxide Produced by the NGWTP/LF007C GWTP



Site ST018 Groundwater Treatment Plant

Monthly Data Sheet

Report Number: 078

Reporting Period: 1 August 2017 – 31 August 2017

Date Submitted: 14 September 2017

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

System Metrics

Table 1 presents operation data from the August 2017 reporting period.

Table 1 – Operations Summary – August 2017

Initial Data Collection: 8/1/2017 10:00	Final Data Collection: 8/31/2017 14:20
Operating Time:	Percent Uptime:
ST018GWTP: 724 hours	ST018GWTP: 100%
	Electrical Power Usage:
	ST018GWTP: 143 kWh (106 lbs CO₂ generated^a)
Gallons Treated: 257,020 gallons	Gallons Treated Since March 2011: 13.4 million gallons
Volume Discharged to Sanitary Sewer: 257,020 gallons	Final Totalizer Reading: 13,426,889 gallons
Cumulative Volume Discharged to Sanitary Sewer since 1 November 2014: 6,930,715 gallons	
MTBE, BTEX, VOC, TPH Mass Removed: 0.36 lbs^b	MTBE, BTEX, VOC, TPH Mass Removed Since March 2011: 42.2 lbs
MTBE (Only) Removed: 0.15 lbs^b	MTBE (Only) Mass Removed Since March 2011: 10.5 lbs
Rolling 12-Month Cost per Total Pounds of Mass Removed: \$17,935 ^{bc}	
Monthly Cost per Pound of Mass Removed: \$6,056 ^{bc}	

^a SiteWise™ estimate that 1 kilowatt hour generated produces 0.74 pounds of GHG.

^b Calculated using August 2017 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 – August 2017		
Location	Average Flow Rate Groundwater (gpm)^a	Hours of Operation
EW2014x18	1.9	724
EW2016x18	1.0	724
EW2019x18	1.7	724
EW2333x18	1.7	724
Site ST018 GWTP	5.9	724
^a Flow rates calculated by dividing total gallons processed by amount of operating time of the pump/system. gpm = gallons per minute ST018GWTP = Site ST018 Groundwater Treatment Plant		

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

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

Summary of O&M Activities

Monthly groundwater treatment samples were collected at the ST018GWTP on 1 August 2017. Results are presented in Table 4. The complete August 2017 laboratory data report is available upon request. The influent concentration for MTBE during the August 2017 sampling event was 71.2 µg/L, which is an increase from the July 2017 sample result of 38.9 µg/L. TPH-g, TPH-d, benzene, and 1,2-DCA were also detected in the influent sample. MTBE was detected in the system effluent sampling location at a concentration of 2.36 µg/L. Acetone was detected in the influent and effluent samples; however, acetone is a common laboratory contaminant and not likely a chemical of concern.

All concentrations of TPH are well below the Fairfield-Suisun Sewer District effluent limitation of 50,000 µg/L for TPH-g and TPH-d, or 100,000 µg/L for TPH-mo. Additionally, the Fairfield-Suisun Sewer District does not currently have a local limit for MTBE, but a limit of 6,400 µg/L is advised based on worker health and safety. Travis AFB will continue to monitor influent and effluent contaminant concentrations to maintain compliance with the Fairfield-Suisun Sewer District discharge permit.

Figure 1 presents plots of the average flow rate and influent total contaminant (MTBE, TPH-g, TPH-d, TPH-mo, BTEX, and VOCs) and MTBE concentrations at the ST018GWTP over the past twelve (12) months. The average flow rate through the ST018GWTP has been cyclical with flow rates decreasing following the wet rainy season (summer and fall) and increasing during the rainy season (winter and spring). The overall average flow rates show an increasing trend. The total influent concentrations have generally been decreasing

over the past 12 months with the exception of April 2017. The overall decrease is largely due to the decrease in TPH-g concentrations. The influent MTBE concentration has also generally been slightly decreasing over the past 12 months.

Optimization Activities

No optimization activities occurred at the ST018GWTP in August 2017.

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 106 pounds of GHG during August 2017 and treated 257,020 gallons of water, which was an increase from July 2017 (90 pounds, treating 205,680 gallons). The amount of GHG produced is directly attributed to the amount of water treated through the system because the only line-power electrical use is for a transfer pump through the GAC system.

TABLE 4

Summary Of Groundwater Analytical Data for August 2017– Site ST018 Groundwater Treatment Plant

Summary of Groundwater Analytical Data for August 2017 - Site 01670 Groundwater Monitoring Point					
Constituent	Instantaneous Maximum* (µg/L)	Detection Limit (µg/L)	N/C	1 August 2017 (µg/L)	
				Influent	System Effluent
Fuel Related Constituents					
Methyl tert-Butyl Ether	6,400	0.15	0	71.2	2.36
Benzene	25,000 ^a	0.15	0	0.20 J	ND
Ethylbenzene	25,000 ^a	0.15	0	ND	ND
Toluene	25,000 ^a	0.15	0	ND	ND
Total Xylenes	25,000 ^a	0.15 – 0.30	0	ND	ND
Total Petroleum Hydrocarbons – Gasoline	50,000 ^b	35	0	40.1 J	ND
Total Petroleum Hydrocarbons – Diesel	50,000 ^b	24	0	54.9 J	ND
Total Petroleum Hydrocarbons – Motor Oil	100,000	24	0	ND	ND
Other					
Acetone	NA	1.0	0	1.43 J	1.75 J
1,2-Dichloroethane	20	0.15	0	0.84	ND

* In accordance with the Fairfield-Suisun Sewer District Effluent 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 Influent Concentrations
and Average Flowrate Twelve Month History

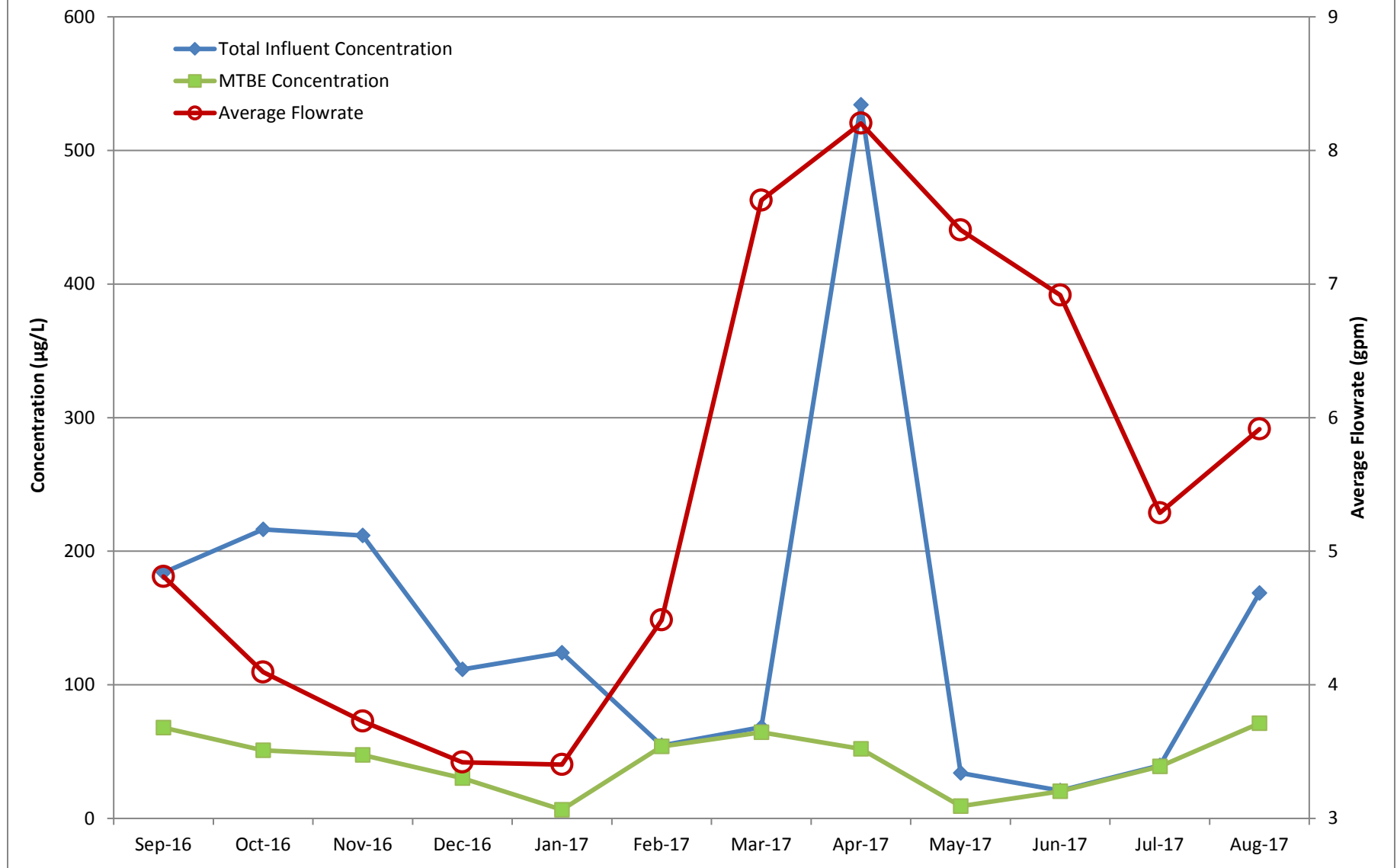
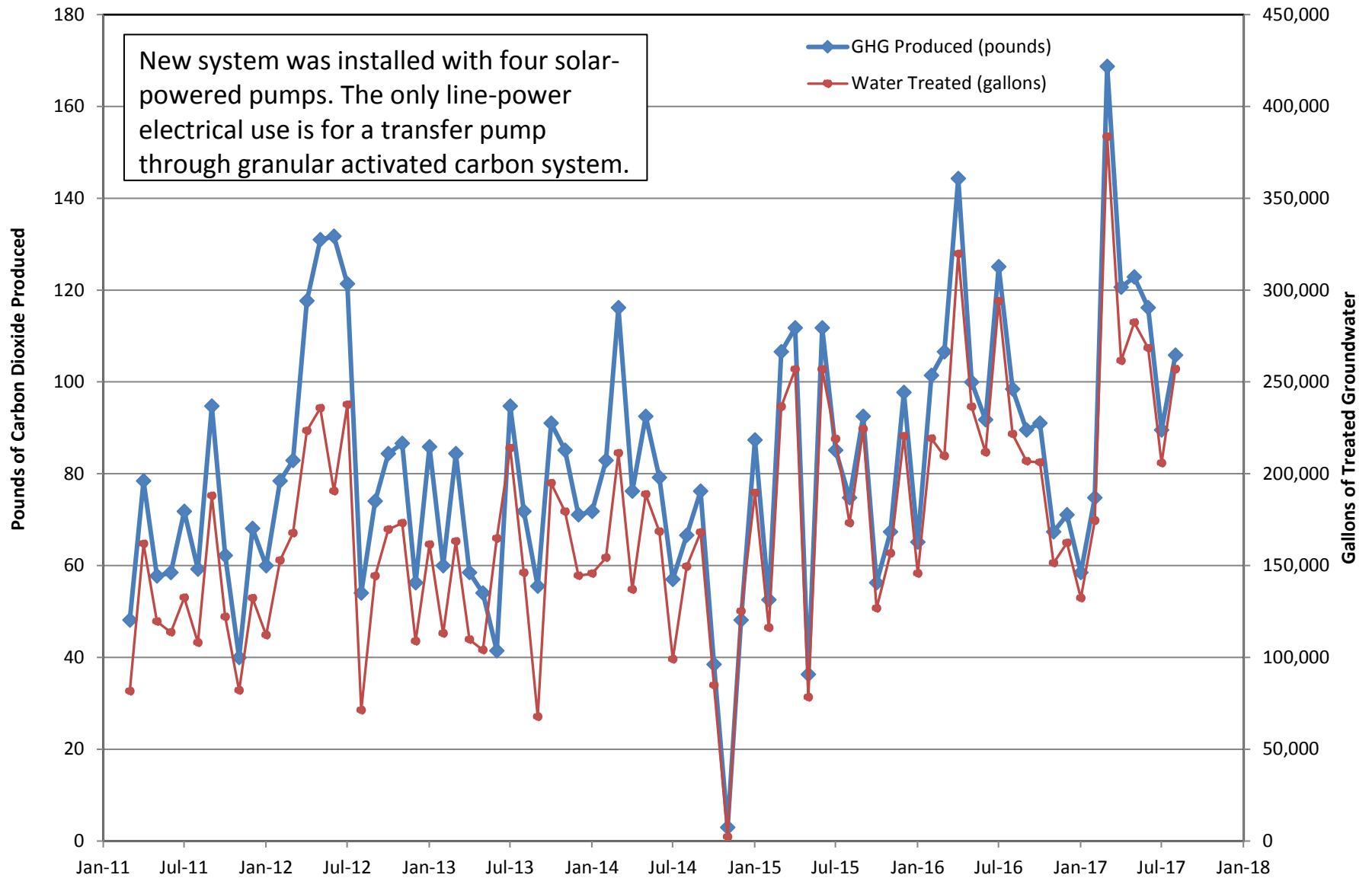
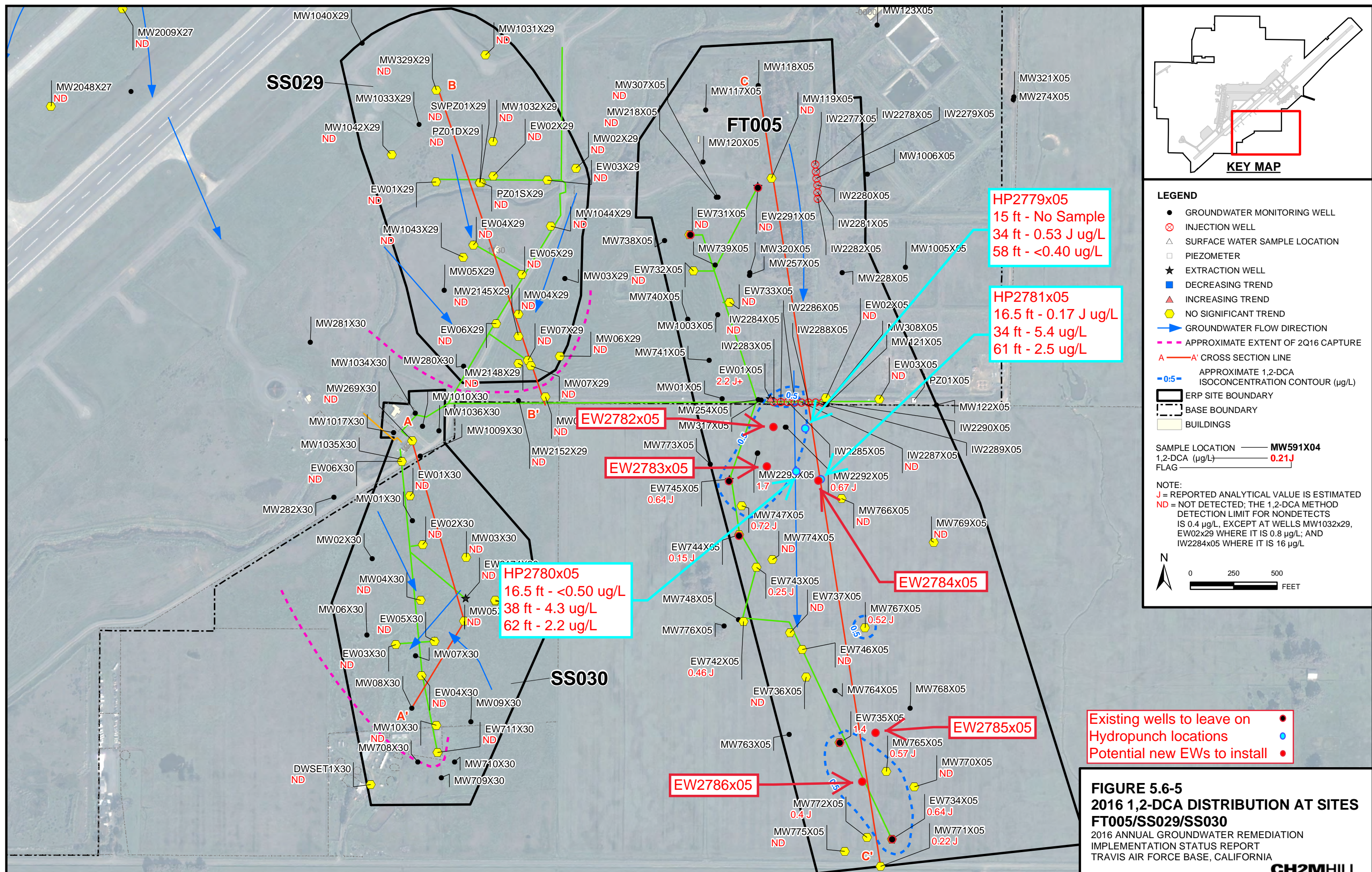


Figure 2

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





Travis AFB Restoration Program

Program Update

RPM Meeting
September 20, 2017

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

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***

Documents In-Progress

CERCLA

- Community Relations Plan
- 2016 Annual GRISR
- 2016 Annual CAMU Monitoring Report
- ***Data Gap Investigation Results, Technical Memorandum for Soil, Sites SD033, SD043, SS046***
- ***Work Plan for Fourth Five-year Review***

POCO

- POCO Evaluation/Closeout Report for DERA-funded oil/water separators OW051, OW053, and OW054
- ***ST032 POCO Well Decommissioning and Site Closeout Technical Memorandum***

Field Work In-Progress

CERCLA

- FT004 EVO Optimization
- SS015 EVO Optimization
- DP039 Install downgradient monitoring wells (2nd round)
- ***FT005 – Install Extraction Wells***

POCO

- None

Documents Planned

CERCLA

- Sep
- Data Gap Investigation Results, Technical Memorandum for Site SS016 Nov
- Amendment to the Soil ROD for WABOU sites DP039, SD043, and SS046 Nov
- ***TS060 Removal Action Completion Report*** ***Nov***

POCO

- POCO Evaluation/Closure Report for DERA-funded Oil/Water Separators OW040, OW047, OW048, OW049, OW050, OW052, OW055, OW056, and OW057 Oct

Field Work Planned

CERCLA

- SD036 EVO Optimization Sep
- SD031 EVO Optimization Sep
- LF044 Sediment Sampling Sep
- SD034 Install bollards around SBGR Oct
- DP039 Repair SBGR distribution headers Oct
- Q4 GRIP Sampling Oct

POCO

- FT004 POCO Soil Data Gaps Investigation Sep

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

Technology Demonstration Projects (1)

- SS014: Recycled Drywall SBGR
 - Evaluate the effectiveness of sulfate (gypsum from crushed drywall) to enhance anaerobic biodegradation of petroleum in groundwater
 - Installation was completed November 2016
 - First quarter performance results
 - TPH-G: 99% reduction in source area (1,900 to 14 J $\mu\text{g/L}$), 18% for remaining 7 site wells
 - TPH-D: 98% reduction in source area (5,500 to 130 J $\mu\text{g/L}$), 33% for remaining 7 site wells
 - Benzene: 98% reduction (22 to <0.4 $\mu\text{g/L}$), 49% for remaining 7 site wells
- Multisite Bioaugmentation: EVO and KB-1 Plus
 - Evaluate if addition of bioaugmentation substrate to an EVO injection will increase the rate of CVOC degradation
 - Injections were completed (Nov 2016)
 - Limited TOC dispersal at SD036, so install additional injection wells and reinject with nanoEVO in 2017
 - Too early to evaluate performance data

Technology Demonstration Projects (2)

- SD034: Washboard SBGR
 - Evaluate the effectiveness of an oxygen-enhanced aerobic SBGR on reducing TPH as diesel (TPH-D) in groundwater
 - Installation was completed November 2016
 - Installed six (6) SBGR trenches.
 - Too early to evaluate performance data
- FT005: Distribution of EVO and KB-1 Plus
 - Evaluate total organic carbon (TOC) dispersion distances and rates for optimizing the remediation of 1,2-dichloroethane (DCA) in groundwater
 - Installation completed May 2016
 - Slightly elevated TOC and reduced COC concentrations in the north, but too early to evaluate performance data
 - In the process of optimization of GETs in southern portion of site, which may help accelerate TOC dispersal to support this TD

Technology Demonstration Projects (3)

- FT004: Distribution of EVO via SBGR and/or Groundwater Extraction
 - Determine effectiveness of TOC distribution through two different enhanced reductive dechlorination (ERD) approaches: (1) groundwater TOC recirculation using a combination EVO injection, infiltration SBGR trenches, and groundwater extraction; and (2) EVO injection with groundwater extraction
 - Installation completed April 2016
 - Limited TOC dispersal, additional EVO injection underway with nanoEVO to determine if this can enhance TOC dispersal
 - COC concentrations have declined
 - ~50% total molar reduction plume-wide through first year
 - Max monitoring well TCE concentration reduced from 560 to 140 µg/L

Technology Demonstration Projects (4)

- SD031: EVO distribution via Gravel Chimneys
 - Determine if EVO injection and recirculation of groundwater through gravel chimneys can effectively distribute TOC horizontally in the subsurface to support ERD of 1,1-dichloroethene (DCE)
 - Installation completed in April 2015
 - Early indications:
 - Reducing conditions have initiated as expected throughout the TD area and are supporting anaerobic degradation
 - TOC concentrations are increasing at several wells
 - Recirculation through chimneys has been successful relative to our design assumptions
 - 1,1-DCE (primary COC) concentrations have reduced by 93% (sum of key wells within TD area, excluding 2 wells to SW that increased)
 - Total Molar concentration (sum of CVOCs) has reduced by 84% (sum of key wells within TD area, excluding 2 wells to SW that increased)
 - Four (4) new EVO wells installed to SW to enhance TOC in problem areas (plume being pulled back towards extraction well causing increasing concentrations in this area)

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 Memorandum¹⁸

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