

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

Mr. Lonnie Duke of the Air Force Civil Engineer Center (AFCEC) Restoration Installation Support Team (IST) conducted the Restoration Program Manager's (RPM) teleconference meeting on 17 May 2017 at 0930 hours in Building 248 at Travis AFB, California. Attendees included:

Lonnie Duke	AFCEC/CZOW
Glenn Anderson	AFCEC/CZOW
Angel Santiago Jr.	AFCEC/CZOW
Milton 'Gene' Clare	AFCEC/CZOW
Monika O'Sullivan	AFCEC/CZOW
William Hall	AFCEC/CZR
(via telephone)	
Merrie Schilter-Lowe	Travis AFB/PA
Adriana Constantinescu	RWQCB
(via telephone)	
Ben Fries	DTSC
(via telephone)	
Nadia Hollan Burke	USEPA
(via telephone)	
Indira Balkissoon	Techlaw, Inc.
(via telephone)	
Jeff Gamlin	CH2M
(via telephone)	
Mike Wray	CH2M

Handouts distributed at the meeting, discussions and presentations included:

Attachment 1	Meeting Agenda
Attachment 2	Master Meeting and Document Schedule
Attachment 3	SBBGWTP Monthly Data Sheet (April 2017)
Attachment 4	CGWTP Monthly Data Sheet (April 2017)
Attachment 5	ST018 Monthly Data Sheet (April 2017)
Attachment 6	Presentation: Site SD034 Technology Demonstration Construction Completion Report
Attachment 7	Presentation: Program Update

1. ADMINISTRATIVE

A. Previous Meeting Minutes

The 20 April 2017 RPM meeting minutes were approved and finalized as written.

B. Action Item Review.

Action items from April 2017 were reviewed.

Action item 1 is ongoing: Ms. O'Sullivan to provide updates on perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA). 17 May 2017: Ms. O'Sullivan said that the Travis AFB site-specific QAPP was mailed to the regulators last week and reminded the regulators of the 30-day review period.

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

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

Travis AFB Annual Meeting and Teleconference Schedule

The next RPM meeting will be a face-to-face meeting, which will be held on Wednesday, 21 June 2017, at 0930 hours.

Travis AFB Master Document Schedule

- Community Involvement Plan (CIP): No change was made to the schedule.
- Work Plan for the Fourth Five-year Review: No change was made to the schedule. Mr. Hall said that the contract should be awarded sometime this week.
- Potrero Hills Annex (FS, PP, and ROD): No change to the schedule.
- Site LF044 Investigation Work Plan: No change was made to the schedule. Ms. Burke said EPA approved the responses-to-comments on the work plan.
- Site SD033, SD043, and SS046 Risk Assessment Technical Memorandum: Predraft to AF/Service Center date change to 14 June 2017. The rest of the dates were changed accordingly.
- Site SS016 Data Gap Investigation Technical Memorandum: New document. All dates are to be determined (TBD). Site SS016 was split-off from the SD033, SD043, and SS046 Risk Assessment Technical Memorandum due to different authors; CH2M and CAPE.

- Site FT004 POCO Soil Data Gap Investigation Work Plan: No change was made to the schedule. Ms. Constantinescu said she will discuss with RWQCB in house specialist and will have her comments submitted by the end of this week.
- Quarterly Newsletters (July 2017): Draft to Agencies date was changed to 5 July 2017. The rest of the dates were changed accordingly.
- 2016 Annual GRISR: No change was made to the schedule.
- 2016 Annual CAMU Monitoring Report: Draft to Agencies date was changed to 9 June 2017, the rest of the dates were changed accordingly.
- Site SD034 Technology Demonstration Construction Completion Report: Draft to Agencies was changed to 2 May 2017 to reflect the actual date, the rest of the dates were changed accordingly.
- POCO Evaluation/Closure Report for DERA-funded Oil/Water Separators OW051, OW053, and OW054: Response to Comments (RTC) Due and Final Due dates were changed to TBD.
- POCO Evaluation/Closure Report for DERA-funded Oil/Water Separators OW040, OW047, OW048, OW049, OW052, OW055, and OW057. Dates were changed to TBD.
- Site SS014 Subsite 1 POCO Technology Demonstration Construction Completion Report: No change was made to the schedule. Ms. Constantinescu is reviewing the document and has not yet provided comments.
- Site ST032 POCO Well Decommissioning and Site Closeout Technical Memorandum: Predraft to AF/Service Center date was changed to 25 April 2017, and AF/Service Center Comments Due date was changed to 9 May 2017 to reflect the actual date. The rest of the dates were changed to TBD. Ms. Constantinescu said she will provide comments on the revised ST028 Technical Memorandum by Friday, 26 May 2017. Mr. Anderson said that the changes made to ST028 Technical Memorandum will be incorporated to the Site ST032 POCO Well Decommissioning and Site Closeout Technical Memorandum.
- Site TS060 Removal Action Work Plan: moved to History.
- Multi-Site Technology Demonstration Construction Completion Report: moved to History.

2. CURRENT PROJECTS

Treatment Plant Operation and Maintenance Update

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

The South Base Boundary Groundwater Treatment Plant (SBBGWTP) performed at 100% uptime, and 4.3 million gallons of groundwater were extracted and treated during the month of April 2017. All of the treated water was discharged to Union Creek. The

average flow rate for the SBBGWTP was 103.0 gallons per minute (gpm). Electrical power usage was 13,569 kWh, and approximately 10,841 pounds of CO₂ were created (based on DOE calculation). Approximately 0.58 pound of volatile organic compounds (VOCs) was removed in April. The total mass of VOCs removed since startup of the system is 485.8 pounds.

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

Mr. Duke said that the SS029 water released from a worn/cracked PVC pipe will be addressed in next month's treatment plant report.

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

The Central Groundwater Treatment Plant (CGWTP) performed at 67.2% uptime with approximately 998,760 gallons of groundwater extracted and treated during the month of April 2017. All treated water was discharged to the storm sewer system. The average flow rate for the CGWTP was 35.6 gpm. Electrical power usage was 1,750 kWh for all equipment connected to the Central Plant, and approximately 2,183 pounds of CO₂ were generated. Approximately 2.15 pounds of VOCs were removed from groundwater by the treatment plant in April. The total mass of VOCs removed since the startup of the system is 11,463 pounds.

Optimization Activities for CGWTP: No optimization activities are reported for the month of April 2017.

Note: The Site DP039 bioreactor is currently undergoing an optimization effort to determine the most effective pulse mode duration to optimize distribution of TOC in the subsurface.

LF007C Groundwater Treatment Plant

The LF007C Groundwater Treatment Plant was taken offline as of 16 December 2016, in accordance with the US Fish and Wildlife Service requirements, due to the presence of standing water in the associated vernal pools.

ST018 Groundwater (MTBE) Treatment Plant, April 2017 (see Attachment 5)

Site ST018 (MTBE) Treatment Plant (ST018 GWTP) performed at 76.8% uptime with approximately 261,430 gallons of groundwater extracted and treated during the month of April 2017. All treated water was discharged to the sanitary sewer system. The average flow rate for the ST018 GWTP was 8.2 gpm. Electrical power usage for the month was 163 kWh for all equipment connected to the ST018 GWTP. The total CO₂ equivalent, including an estimate for the carbon change-out, equates to approximately 121 pounds. Approximately 1.10 pound of BTEX, MTBE and TPH was removed in April by the treatment plant, and approximately 0.11 pound of MTBE was removed

from groundwater. The total BTEX, MTBE and TPH mass removed since the startup of the system is 41.6 pounds, and the total MTBE mass removed since startup of the system is 10.2 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 ST018GWTP: No optimization activities to report for the month of April 2017.

Mr. Wray said that Travis AFB will be working with the Fairfield Sanitary Sewer District (FSSD) regarding bypassing the carbon vessels during treatment of the influent within the treatment system. FSSD effluent limitations are very high compared to the detections that have been observed over the years that the system has been operating. The carbon vessels were originally installed, because the system operated under a NPDES permit.

Presentation:

SD034 Aerobic SBGR Installation (see Attachment 6)

Mr. Gamlin reported on SD034 Aerobic Subgrade Biochemical Reactor (SBGR) Installation. See attachment 6 for details. Highlights included:

This presentation is an overview of the construction activities that were completed in 2016 at Site SD034.

The Site SD034 system which was recently installed is called an aerobic washboard SBGR. The goal for this site is to determine if we can enhance the oxygen in the formation by cycling groundwater back and forth across the site and injecting oxygen into our aerobic SBGRs. We are calling it “the washboard effect”. Part of the week we are pumping water from one side of the site, and the other part of the week we are pumping from the other side of the site. One goal is to get the water table to go up and down in the area of the residual LNAPL, so we can increase the oxygen level and increase the dissolution of the little bit of LNAPL that is still present. The addition of the oxygen will enhance the performance of aerobic bacteria that degrade petroleum hydrocarbons.

The intent is to get the oxygen moving back and forth as efficiently as possible through the aquifer, and through the capillary fringe and smear zone. Then evaluate if this is going to be a good way to potentially optimize the rate of contaminant removal at this site. If successful we will go forward with a ROD amendment and have this technology demonstration incorporated as part of the remedy.

Key points for construction of the aerobic washboard SBGR trenches include:

- Incorporated several aerobic processes to treat the Stoddard solvent hydrocarbon source area of the plume.
- The washboard SBGR is adjacent to a large hanger with complicated utilities. In addition to foundation considerations, we encountered several unexpected buried utilities, so we had to reposition some trenches from the original design.
- Special potholing equipment was brought in so we could go down to 20 ft. in order to daylight and avoid damaging any utilities, in particular the aqueous film forming foam (AFFF) line that was buried about 8 ft. Potholing incorporates a combination of systems; water, pressure and vacuum. The water is pressurized and injected into the ground through a handheld wand to safely wash away the soil from around the underground infrastructure. The resulting slurry is simultaneously vacuumed out into a debris tank.
- In the original design we intended the washboard SBGR to have seven (7) trenches but with all the underground utilities we had to revisit our design and reduce the number of trenches, and we had to reconfigure the remaining six (6) trenches to avoid utilities. The six (6) trenches are more than efficient to evaluate this technology, and at this point we don't see any need to install the seventh trench. The trenches were backfilled with gravel, calcium peroxide, a vitamin package, and infiltration/sparge lines. Recirculated water percolates through the gravel. The calcium peroxide gives off oxygen.
- At the bottom of the trenches we installed a secondary set of infiltration lines that could be used for air sparging if needed in the future. Currently the water is being infiltrated through the upper line about four (4) ft. bgs., and then percolates downwards.
- In each of the extraction wells we have installed an in situ Submerged Oxygen Curtain (iSOC) device. The iSOC diffuses very small bubbles of oxygen into the water to generate much higher concentrations of dissolved oxygen than air sparging.
- As we collect performance data, we will continue to look at adjusting the pumping rotation.

Ms. Burke asked about the AFFF line found in this area and the upcoming base-wide sampling for PFOS/PFOA and wanted to make sure that the contractors are aware of the recent construction at this site. Ms. O'Sullivan said building 811 is one of the locations they are looking to sample, and the dig permit process will specify any utilities. Mr. Santiago added that the IST team reviews all new dig permit requests.

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

Mr. Wray reported on the status of fieldwork and documents which are completed, in progress, and upcoming. Updates from the briefing this month included:

Newly Completed Documents: None.

Newly Completed Fieldwork: OW050 Soil Sampling at Former Location of the OWS.

In-Progress Documents (CERCLA): Community Involvement Plan; Site LF044 Investigation Work Plan; Site FT004 POCO Soil Data Gap Investigation Work Plan; SD034 Technology Demonstration Construction Completion Report.

In-Progress Documents (POCO): POCO Evaluation/Closeout Report for DERA-funded oil/water separators OW051, OW053, and OW054; SS014 POCO Technology Demonstration Construction Completion Report.

In-Progress Fieldwork (CERCLA): Q2 2017 GRIP Sampling Event; SS015 Optimization: Injection Well Installation; DP039 Down-gradient Monitoring Well Installation; SD036 Optimization: Injection Well Installation; SD031 Optimization: Injection Well installation.

In-Progress Fieldwork (POCO): None.

Planned Documents (CERCLA): 2016 Annual CAMU Monitoring Report (June); 2016 Annual GRISR (June); Data Gap Investigation Results, Technical Memorandum for Soil, Sites SD033, SD043, SS046 (July); Site SS016 Data Gap Investigation Technical Memorandum (TBD); Work Plan for Fourth Five-year Review (TBD).

Planned Documents (POCO): POCO Evaluation/Closure Report for DERA-funded Oil/Water Separators OW040, OW047, OW048, OW049, OW052, OW055, and OW057 (TBD); ST032 POCO Well Decommissioning and Site Closeout Technical Memorandum (TBD).

Fieldwork Planned (CERCLA): SD031 Finish Soil Delineation (NE portion of site) (May); FT004 EVO Optimization (May); TS060 Removal Action (June); SS015 EVO Optimization (June); SD036 EVO Optimization (July); SD031 EVO Optimization (August); LF044 Sediment Sampling (2017).

Fieldwork Planned (POCO): OW055 Sidewalk Repairs (May); OW056 Site Excavation/Closure (June); FT004 POCO Soil Data Gaps Investigation (July).

Technology Demonstration Projects:

- SS014: Recycled Drywall Subgrade Biochemical Reactor “SBGR”.
 - Evaluate the effectiveness of sulfate (gypsum from crushed drywall) to enhance anaerobic biodegradation of petroleum in groundwater.

- Installation completed November 2016.
 - Area below SBGR has been initially reduced to non-detect, but too early to evaluate performance data.
- 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.
- 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.
 - May evaluate optimization of GETs in southern portion of site.
- 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, but COC concentration have declined. Optimization including additional EVO injection is planned for 2017 with nanoEVO to determine if this can enhance TOC dispersal.
- 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.
 - 1,1-DCE (primary COC) concentrations have reduced by 57% (sum of key wells within TD area).
 - Total Molar concentration (sum of CVOCs) has reduced by 49% (sum of key wells within TD area).

- Recirculation through chimneys has been successful relative to our design assumptions.

Ms. Constantinescu asked what the frequency of groundwater sampling site SS014 after the installation of the SBGR will be? Mr. Gamlin said quarterly the first year and reduced sample frequency the second year.

Ms. Burke requested scheduling a teleconference call to discuss questions that Techlaw's engineer expert raised regarding the nanoEVO smaller droplet size.

4. New Action Item Review

Mr. Wray to provide an explanation on how we calculated the volume of water released in a remote, unpopulated area from a worn PVC pipe coupling at site SS029.

5. PROGRAM/ISSUES/UPDATE

Mr. Duke announced that the Travis IST won the Secretary of Defense Environmental Restoration Award.

6. Action Items

Item #	Responsible	Action Item Description	Due Date	Status
1.	Monika O'Sullivan	Ms. O'Sullivan to provide updates on PFOS and PFOA as she becomes aware of them.	Ongoing	Open
2.	Mr. Wray	Provide an explanation on how we calculated the volume of water released from a worn PVC pipe coupling at site SS029.	21 June 2017	Open

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

The RPM Teleconference is scheduled for 9:30 AM PST on 17 May 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. SITE SD034 TECHNOLOGY DEMONSTRATION CONSTRUCTION COMPLETION REPORT
- 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.

Travis AFB Master Meeting and Document Schedule

PRIMARY DOCUMENTS		
Life Cycle	Community Involvement Plan Travis AFB, Glenn Anderson CH2M HILL, Jill Dunphy	Work Plan for the Fourth Five-year Review Travis AFB, Glenn Anderson Tetrattech, Joachim Eberharter
Scoping Meeting	NA	TBD
Predraft to AF/Service Center	08-23-16	TBD
AF/Service Center Comments Due	09-07-16	TBD
Draft to Agencies	09-28-16	TBD
Draft to RAB	09-28-16	TBD
Agency Comments Due	10-28-16 (11-28-16)	TBD
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

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	Site LF044 Investigation Work Plan Travis AFB, Glenn Anderson CH2M HILL, Doug Berwick CAPE, Meg Greenwald	Data Gap Investigation Results Technical Memorandum for Soil Sites SD033, SD043, and SS046 Travis AFB, Glenn Anderson CH2M HILL, Tony Chakurian	Site SS016 Data Gap Investigation Technical Memorandum Travis AFB, Glenn Anderson CH2M HILL, Doug Berwick CAPE, Meg Greenwald
Scoping Meeting	NA	NA	NA
Predraft to AF/Service Center	04-26-16	06-14-17	TBD
AF/Service Center Comments Due	05-10-16	06-28-17	TBD
Draft to Agencies	06-27-16	07-13-17	TBD
Draft to RAB	06-27-16	07-13-17	TBD
Agency Comments Due	07-28-16	08-14-17	TBD
Response to Comments Meeting	08-17-16	08-16-17	TBD
Response to Comments Due	08-31-16 (05-23-17)	08-30-17	TBD
Draft Final Due	NA	NA	NA
Final Due	08-31-16 (05-23-17)	08-30-17	TBD
Public Comment Period	NA	NA	NA
Public Meeting	NA	NA	NA

Travis AFB Master Meeting and Document Schedule

SECONDARY POCO DOCUMENTS	
Life Cycle	Site FT004 POCO Soil Data Gap Investigation Work Plan Travis AFB, Glenn Anderson CH2M HILL, Doug Berwick CAPE, Meg Greenwald
Scoping Meeting	NA
Predraft to AF/Service Center	06-03-16
AF/Service Center Comments Due	06-17-16
Draft to Agencies	07-19-16
Draft to RAB	07-19-16
Agency Comments Due	08-19-16
Response to Comments Meeting	09-21-16
Response to Comments Due	10-06-16 (05-05-17)
Draft Final Due	NA
Final Due	10-06-16 (05-05-17)
Public Comment Period	NA
Public Meeting	NA

Travis AFB Master Meeting and Document Schedule

INFORMATIONAL DOCUMENTS		
Life Cycle	Quarterly Newsletters (July 2017) Travis, Glenn Anderson	2016 Annual GRISR Travis AFB, Glenn Anderson CH2M HILL, 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	07-05-17	06-07-17
Draft to RAB	NA	06-07-17
Agency Comments Due	07-17-17	07-10-17
Response to Comments Meeting	TBD	07-19-17
Response to Comments Due	07-18-17	08-02-17
Draft Final Due	NA	NA
Final Due	07-18-17	08-02-17
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 HILL, Levi Pratt	Site SD034 Technology Demonstration Construction Completion Report Travis AFB, Glenn Anderson CH2M HILL, Levi Pratt
Scoping Meeting	NA	NA
Predraft to AF/Service Center	02-09-17	03-23-17
AF/Service Center Comments Due	02-24-17	04-06-17
Draft to Agencies	06-09-17	05-02-17
Draft to RAB	06-09-17	05-02-17
Agency Comments Due	07-10-17	06-02-17
Response to Comments Meeting	07-19-17	06-21-17
Response to Comments Due	08-04-17	07-06-17
Draft Final Due	NA	NA
Final Due	08-04-17	07-06-17
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 HILL, Doug Berwick	POCO Evaluation/Closure Report for DERA-funded Oil/Water Separators OW040, OW047, OW048, OW049, OW052, OW055, and OW057 Travis AFB, Glenn Anderson CH2M HILL, Doug Berwick
Scoping Meeting	NA	NA
Predraft to AF/Service Center	11-07-16	02-01-17
AF/Service Center Comments Due	11-21-16	02-15-17
Draft to Agencies	01-19-17	TBD
Draft to RAB	01-19-17	TBD
Agency Comments Due	02-21-17	TBD
Response to Comments Meeting	03-15-17	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

Travis AFB Master Meeting and Document Schedule

INFORMATIONAL POCO DOCUMENTS		
Life Cycle	Site SS014 Subsite 1 POCO Technology Demonstration Construction Completion Report Travis AFB, Glenn Anderson CH2M HILL, Levi Pratt	Site ST032 POCO Well Decommissioning and Site Closeout Technical Memorandum Travis AFB, Glenn Anderson CH2M HILL, Doug Berwick
Scoping Meeting	NA	NA
Predraft to AF/Service Center	03-01-17	04-25-17
AF/Service Center Comments Due	03-15-17	05-09-17
Draft to Agencies	04-12-17	TBD
Draft to RAB	04-12-17	TBD
Agency Comments Due	05-12-17	TBD
Response to Comments Meeting	05-17-17	TBD
Response to Comments Due	06-15-17	TBD
Draft Final Due	NA	NA
Final Due	06-15-17	TBD
Public Comment Period	NA	NA
Public Meeting	NA	NA

Travis AFB Master Meeting and Document Schedule

HISTORY - PRIMARY DOCUMENTS	
Life Cycle	Site TS060 Removal Action Work Plan Travis AFB, Glenn Anderson CH2M HILL, Doug Berwick CAPE, Meg Greenwald
Scoping Meeting	NA
Predraft to AF/Service Center	04-14-16
AF/Service Center Comments Due	04-28-16
Draft to Agencies	06-20-16
Draft to RAB	06-20-16
Agency Comments Due	07-27-16
Response to Comments Meeting	08-17-16
Agency Concurrence with Remedy	NA
Public Comment Period	NA
Public Meeting	NA
Response to Comments Due	03-10-17
Draft Final Due	03-10-17
Final Due	04-10-17 (03-31-17)

Travis AFB Master Meeting and Document Schedule

HISTORY - INFORMATIONAL DOCUMENTS	
Life Cycle	Multi-Site Technology Demonstration Construction Completion Report Travis AFB, Glenn Anderson CH2M HILL, Renee Caird
Scoping Meeting	NA
Predraft to AF/Service Center	12-15-16
AF/Service Center Comments Due	01-13-17
Draft to Agencies	01-27-17
Draft to RAB	01-27-17
Agency Comments Due	02-27-17
Response to Comments Meeting	03-15-17
Response to Comments Due	03-29-17 (3-22-17)
Draft Final Due	TBD
Final Due	03-29-17 (3-22-17)
Public Comment Period	NA
Public Meeting	NA

South Base Boundary Groundwater Treatment Plant

Monthly Data Sheet

Report Number: 198

Reporting Period: 3 April 2017 – 2 May 2017

Date Submitted: 4 May 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 April 2017 reporting period.

Table 1 – Operations Summary – April 2017			
Initial Data Collection:		4/3/2017 14:20	Final Data Collection: 5/2/2017 07:40
Operating Time:		Percent Uptime:	Electrical Power Usage:
SBBGWTP:	689 hours	SBBGWTP:	100%
Gallons Treated: 4.3 million gallons		Gallons Treated Since July 1998: 970 million gallons	
Volume Discharged to Union Creek: 4.3 million gallons		Gallons Treat From Other Sources: 0 gallons	
VOC Mass Removed: 0.58 lbs ^b		VOC Mass Removed Since July 1998: 485.8 lbs	
Rolling 12-Month Cost per Pound of Mass Removed: \$12,298 ^c			
Monthly Cost per Pound of Mass Removed: \$16,240 ^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 April 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 – April 2017							
FT005 ^b				SS029		SS030	
EW01x05	Offline	EW736x05	Offline	EW01x29	3.2	EW01x30	13.0
EW02x05	Offline	EW737x05	Offline	EW02x29	3.9	EW02x30	4.6
EW03x05	Offline	EW742x05	Offline	EW03x29	4.1	EW03x30	15.0
EW731x05	5.5	EW743x05	5.8	EW04x29	Offline ^c	EW04x30	22.0
EW732x05	Offline	EW744x05	4.6	EW05x29	5.4	EW05x30	17.2
EW733x05	Offline	EW745x05	Offline ^c	EW06x29	0.5	EW2174x30	10.4
EW734x05	Offline ^c	EW746x05	Offline	EW07x29	6.2	EW711x30	4.0
EW735x05	7.3	EW2291x05	5.2				
FT005 Total: 28.4				SS029 Total: 23.3		SS030 Total: 86.2	
SBBGWTP Average Monthly Flow ^d : 103.0 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 These extraction wells are offline due to pump or other malfunction.							
^d The average SBBGWTP groundwater flow rate was calculated using the Union Creek Discharge Totalizer and dividing it by the total time the system was operational.							
gpm – gallons per minute							
SBBGWTP – South Base Boundary Groundwater Treatment Plant							

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

Table 3 – Summary of System Shutdowns					
Location	Shutdown ^a		Restart ^a		Cause
	Date	Time	Date	Time	
SBBGWTP	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 4 April 2017 sampling event are presented in Table 4. The total VOC concentration (16.27 µg/L) in the influent sample has decreased from the March 2017 sample results (28.75 µg/L). TCE (15.1 µg/L), cis-1,2-DCE (0.90 µg/L), and chloroform (0.27 J µg/L) were detected at the influent sampling location. Acetone, a common laboratory contaminant, was detected in the midpoint sampling location. No other VOCs were detected at the midpoint and effluent sampling locations.

In April 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:

- EW734x05 – The extraction well remains off line while troubleshooting the wiring faults.
- EW743x05 – Extraction well is on line; however, it has a faulty transducer.
- EW745x05 – Off line because of low flow. Possible flow meter malfunction.
- EW04x29 – Pump was fouled with manganese oxide. Pump was pulled and will be cleaned before re-installing in May 2017.
- EW05x29 – Pump had disconnected from drop pipe. The pump was reattached. In addition, the pressure transducer was replaced. Well is currently operating.
- EW02x30 – Replaced flow meter fitting. Well is currently operating.
- EW711x30 – Replaced sections of corroded communication wires. Well is currently operating.

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; however, the flow rate shows an increasing trend.

Optimization Activities

No optimization activities occurred at the SBBGWTP in April 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 April 2017, the SBBGWTP produced approximately 10,841 pounds of GHG, which includes approximately 800 pounds of GHG generated from changing out the GAC.

TABLE 4

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

Constituent	Instantaneous Maximum* (µg/L)	Detection Limit (µg/L)	N/C	4 April 2017 (µg/L)		
				Influent	Midpoint	Effluent
Halogenated Volatile Organics						
Acetone	NA	1.0	0	ND	2.27 J	ND
Bromodichloromethane	NA	0.15	0	ND	ND	ND
Carbon Tetrachloride	0.5	0.15	0	ND	ND	ND
Chloroform	5.0	0.15	0	0.27 J	ND	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	ND	ND	ND
1,1-Dichloroethene	5.0	0.15	0	ND	ND	ND
cis-1,2-Dichloroethene	5.0	0.15	0	0.90	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	15.1	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

* 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

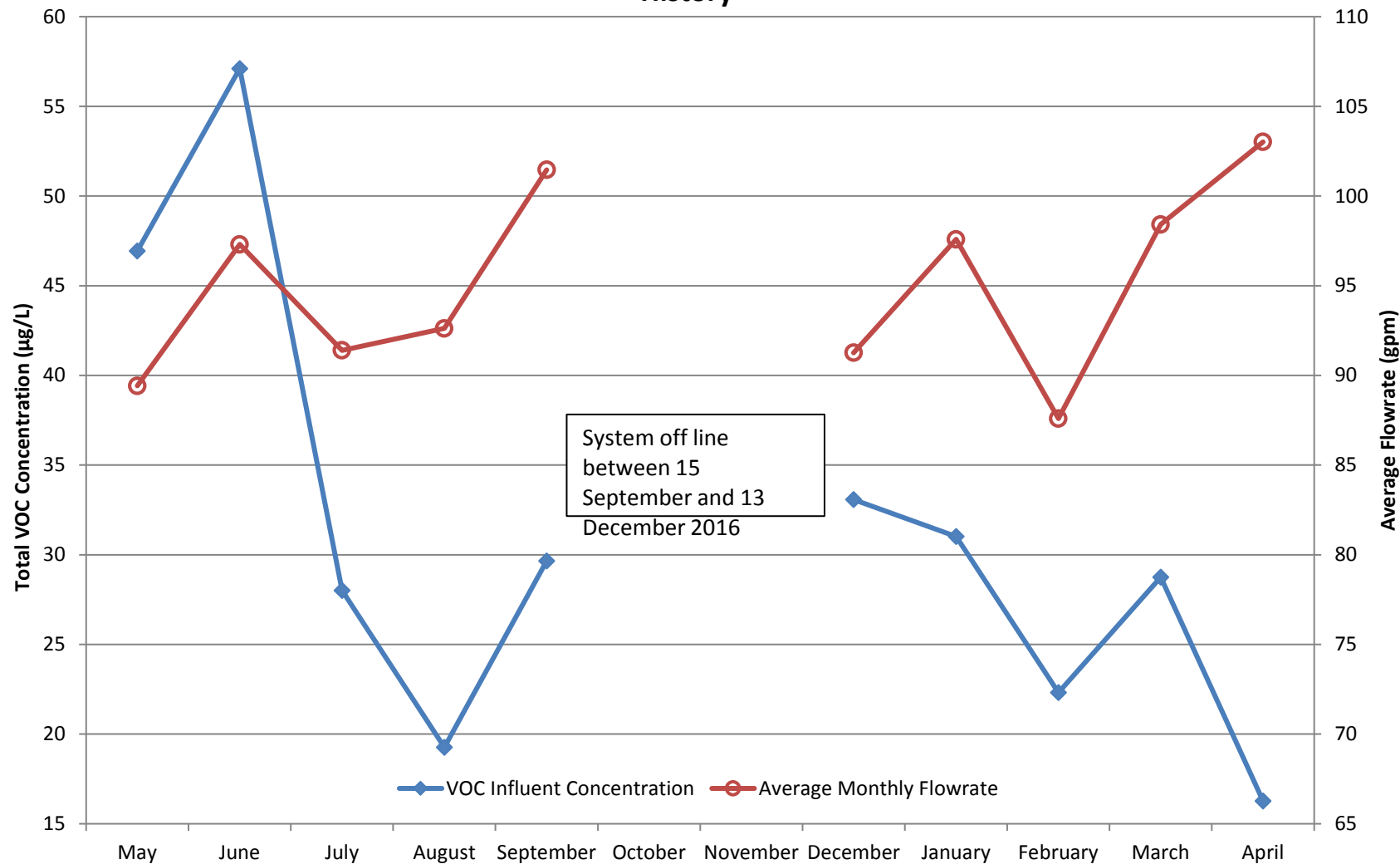
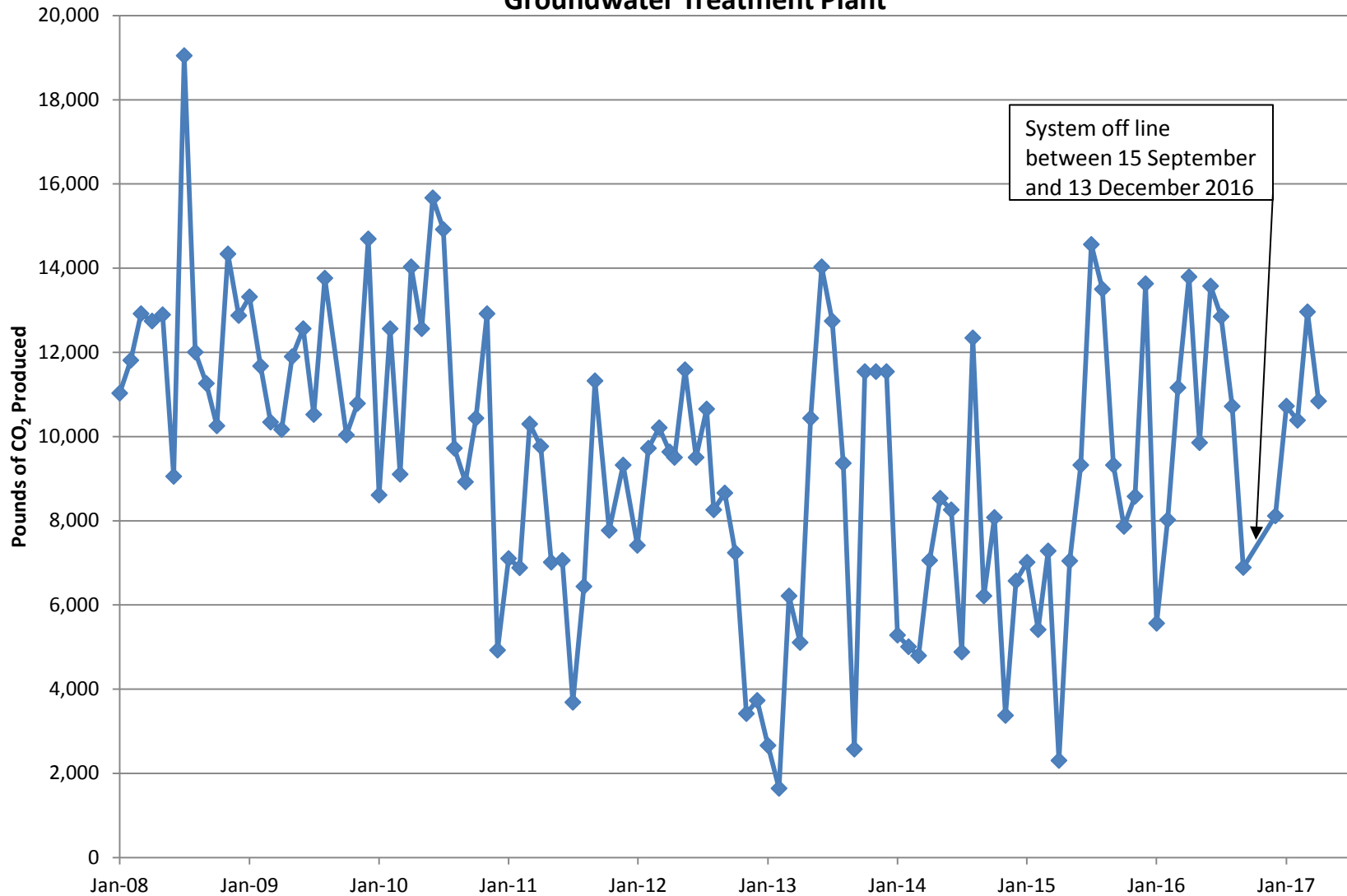


Figure 2

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



Central Groundwater Treatment Plant Monthly Data Sheet

Report Number: 213

Reporting Period: 3 April 2017 – 2 May 2017

Date Submitted: 4 May 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 April 2017 reporting period.

Table 1 – Operations Summary – April 2017				
Initial Data Collection:		4/3/2017 10:00	Final Data Collection:	5/2/2017 10:00
Operating Time:		Percent Uptime:		Electrical Power Usage:
CGWTP:	468 hours	CGWTP:	67.2%	CGWTP: 1,750 kWh (2,183 lbs CO ₂ generated ^a)
Gallons Treated (discharge to storm sewer):		Gallons Treated Since January 1996: 540.2 million gallons		
998,760 gallons				
VOC Mass Removed from groundwater:		VOC Mass Removed Since January 1996:		
2.15 lbs^b		2,777 lbs from groundwater		
		8,686 lbs from vapor		
Rolling 12-Month Cost per Pound of Mass Removed: \$2,209 ^c				
Monthly Cost per Pound of Mass Removed: \$1,802 ^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.				
^b Calculated using April 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 during the monthly reporting period.

Table 2 – CGWTP Average Flow Rates ^a – April 2017	
Location	Average Flow Rate Groundwater (gpm)
EW001x16	18.5
EW002x16	11.5
EW003x16	0.1 ^b
EW605x16	6.7
EW610x16	3.0
CGWTP	35.6
^a Flow rates calculated by dividing total gallons processed by system operating time for the month or the average of the instantaneous readings.	
^b Flow rate estimated. No gallons recorded during April 2017.	
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	Various	--	Various	--	Intermittent shutdowns due to influent tank high level conditions.
-- = 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 4 April 2017. Sample results are presented in Table 4. The total VOC concentration (259.32 µg/L) in the April 2017 influent sample has increased from the March 2017 sample (235.11 µg/L). TCE was the primary VOC detected in the influent sample at a concentration of 221 µg/L. Cis-1,2-DCE (5.40 µg/L) and vinyl chloride (0.19 µg/L) were detected in the sample collected after the first carbon vessel. In addition, vinyl chloride was detected at a trace concentration in the sample collected after the second carbon vessel. No VOC constituents were detected in the effluent sample. Acetone was detected in all four treatment plant samples; however, acetone is a common laboratory contaminant. Travis AFB will continue to monitor influent, midpoint, and effluent concentrations at the CGWTP for carbon breakthrough, though the carbon treatment remained effective in April 2017.

In April 2017, the CGWTP intermittently shut down due to erroneous water level measurements in the influent tank. No alarms were activated during each shutdown. In each case, the treatment plant was reset and the CGWTP was restarted without issue. The cause of the shutdowns will continue to be investigated in May 2017. It is estimated that the plant was shut down for 228 hours during these intermittent outages.

The totalizer for extraction well EW003x16 did not show any flow during April 2017. Troubleshooting to identify any problems with this well and the Site SS016 subgrade biogeochemical reactor (SBGR) will be conducted in May 2017.

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 concentration has displayed a slightly decreasing trend over the past year. However, the overall flow rate through the treatment plant has increased over the past 12 months.

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). During this optimization effort, the pulsed mode operation will consist of three (3) different time scales: one week, two week, and four week pulsed modes. Samples will be collected after each round of pulsed mode operation. This will help determine which duration of each pulsed mode cycle of the bioreactor is most effective.

On 5 April, the bioreactor began the second round of the four-week operational cycle (four weeks on, four weeks off, four weeks on). The bioreactor will remain on line for four weeks. Groundwater samples will be collected from several DP039 monitoring wells after the twelve-week test in May 2017.

Optimization Activities

No optimization activities occurred at the CGWTP in April 2017. As discussed above, the Site DP039 bioreactor is currently undergoing an optimization effort to determine the most effective pulse mode duration to optimize distribution of TOC in the subsurface.

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 2,183 pounds of GHG during April 2017. This is a decrease from the March 2017 amount of 2,671 pounds.

TABLE 4

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

				4 April 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	1.94 J	1.55 J	1.76 J	1.33 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	32.3	7.68	ND	ND
1,2-Dichlorobenzene	5.0	0.15	0	0.28 J	ND	ND	ND
1,3-Dichlorobenzene	5.0	0.15	0	0.28 J	ND	ND	ND
1,4-Dichlorobenzene	5.0	0.15	0	0.16 J	ND	ND	ND
1,1-Dichloroethane	5.0	0.15	0	ND	ND	ND	ND
1,2-Dichloroethane	0.5	0.15	0	ND	ND	ND	ND
1,1-Dichloroethene	5.0	0.15	0	0.55	ND	ND	ND
Methylene Chloride	5.0	0.15	0	ND	ND	ND	ND
Methyl tert-Butyl Ether	1.0	0.15	0	ND	ND	ND	ND
Tetrachloroethene	5.0	0.15	0	0.43 J	ND	ND	ND
1,1,1-Trichloroethane	5.0	0.15	0	ND	ND	ND	ND
1,1,2-Trichloroethane	5.0	0.15	0	ND	ND	ND	ND
trans-1,2-Dichloroethene	5.0	0.15	0	2.18	ND	ND	ND
Trichloroethene	5.0	0.15 – 1.5	0	221	ND	ND	ND
Vinyl Chloride	0.5	0.15	0	0.20 J	0.19 J	0.23 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	8 April 2016	22 April 2016
	4 May 2016	13 May 2016
	27 May 2016	17 June 2016
	1 July 2016	19 July 2016
	2 August 2016	12 August 2016
	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	
MW = Monitoring Well		

Figure 1

CGWTP Total VOC Influent Concentrations and Average Flowrate Twelve Month History

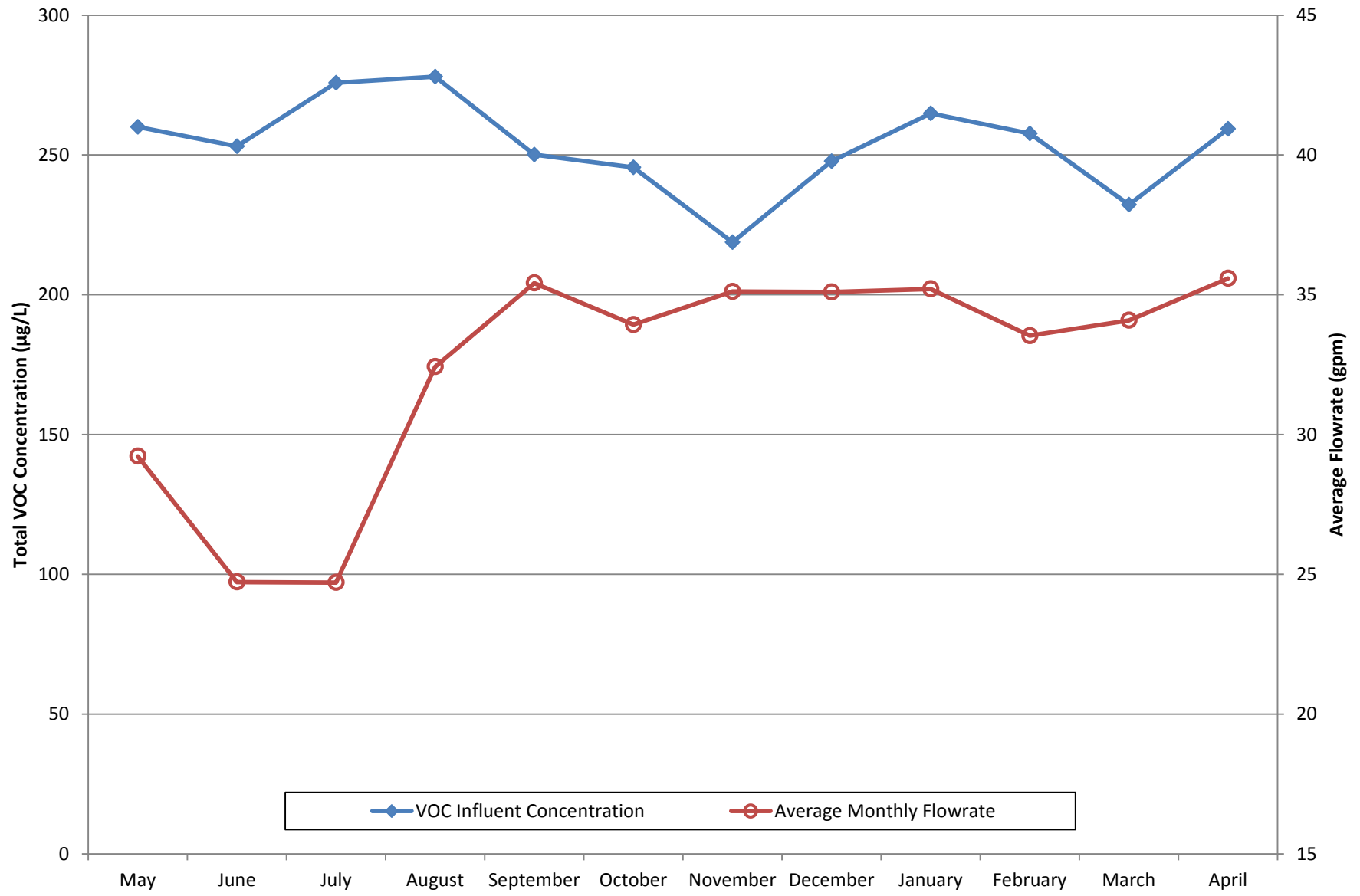
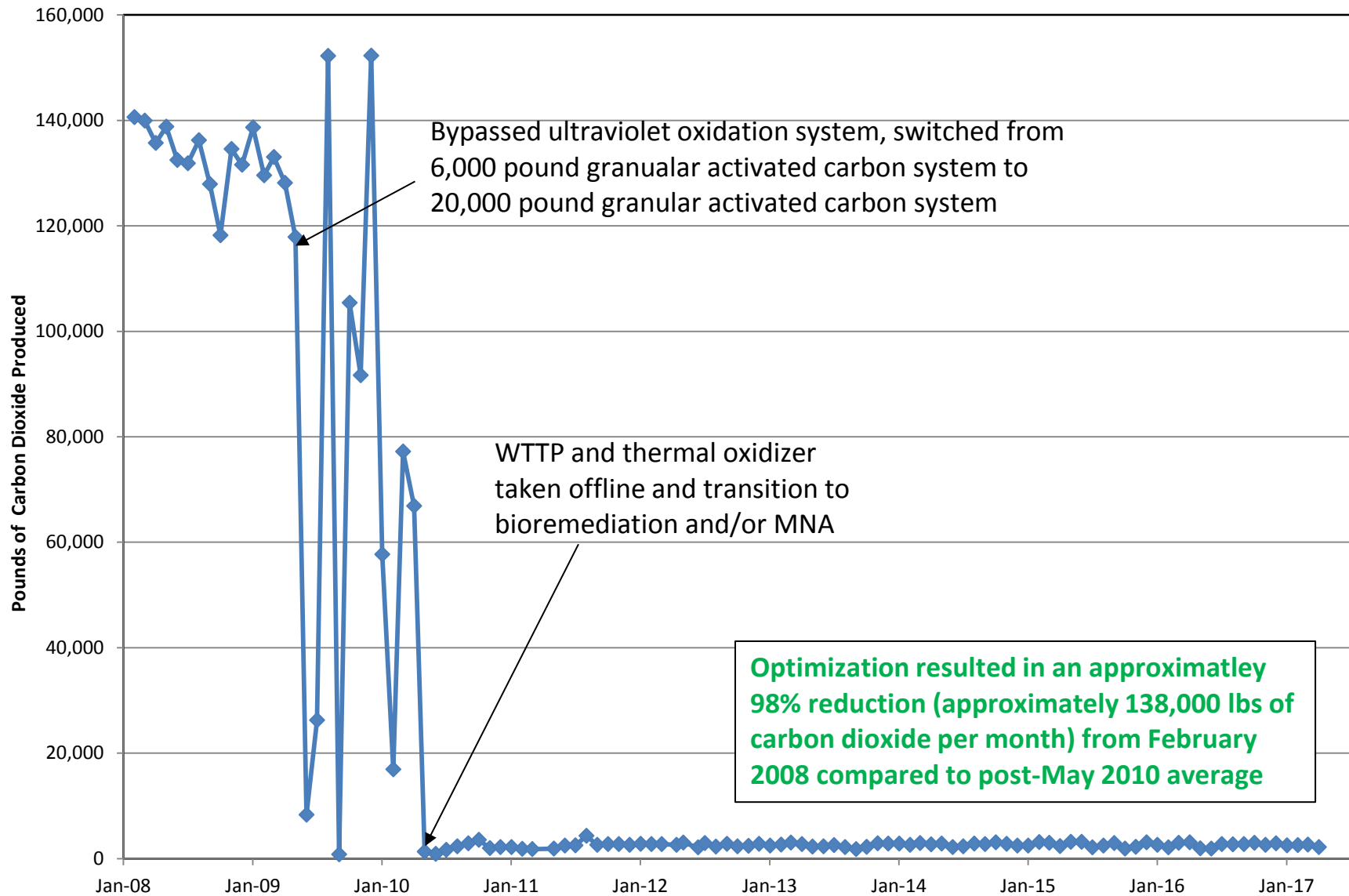


Figure 2

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



Site ST018 Groundwater Treatment Plant

Monthly Data Sheet

Report Number: 074

Reporting Period: 3 April 2017 – 2 May 2017

Date Submitted: 4 May 2017

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

System Metrics

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

Table 1 – Operations Summary – April 2017			
Initial Data Collection:	4/3/2017 13:30	Final Data Collection:	5/2/2017 8:55
Operating Time:		Percent Uptime:	Electrical Power Usage:
ST018GWTP: 531 hours		ST018GWTP: 76.8%	ST018GWTP: 163 kWh (121 lbs CO ₂ generated ^a)
Gallons Treated: 261,430 gallons		Gallons Treated Since March 2011: 12.4 million gallons	
Volume Discharged to Sanitary Sewer: 261,430 gallons		Final Totalizer Reading: 12,413,519 gallons	
Cumulative Volume Discharged to Sanitary Sewer since 1 November 2014: 5,917,345 gallons			
MTBE, BTEX, VOC, TPH Mass Removed: 1.10 lbs^b		MTBE, BTEX, VOC, TPH Mass Removed Since March 2011: 41.6 lbs	
MTBE (Only) Removed: 0.11 lbs^b		MTBE (Only) Mass Removed Since March 2011: 10.2 lbs	
Rolling 12-Month Cost per Total Pounds of Mass Removed: \$16,028 ^{bc}			
Monthly Cost per Pound of Mass Removed: \$3,430 ^{bc}			
^a SiteWise™ estimate that 1 kilowatt hour generated produces 0.74 pounds of GHG.			
^b Calculated using April 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 – April 2017		
Location	Average Flow Rate Groundwater (gpm)^a	Hours of Operation
EW2014x18	1.2	531
EW2016x18	1.6	531
EW2019x18	2.1	531
EW2333x18	2.0	531
Site ST018 GWTP	8.2	531
^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	7 April 2017	11:00	13 April 2017	10:50	High pressure alarm.
-- = 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 4 April 2017. Results are presented in Table 4. The complete April 2017 laboratory data report is available upon request. The influent concentration for MTBE during the April 2017 sampling event was 52 J µg/L, which is a decrease from the March 2017 sample result of 64.5 J µg/L. TPH, BTEX compounds, and 1,2-DCA were also detected in the influent sample. MTBE was detected in the system effluent sampling location at concentrations of 2.33 µg/L.

All concentrations of TPH are well below the Fairfield-Suisun Sewer District effluent limitation of 50,000 µg/L, 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 steadily decreasing between May 2016 and January 2017; however, flow rates have continued to increase since in February 2017. The total influent concentrations remained relatively steady between May and November 2016, and then decreased from December 2016 to March 2017. The decrease was largely because of the decrease in TPH-g concentrations and EW2014x18 being

off line. In April 2017, the total influent concentrations rebounded significantly. The influent MTBE concentration has generally been decreasing slightly over the past 12 months.

On 7 April, the ST018GWTP was shut down because of a high pressure alarm. On 13 April, the bag filters were replaced and the system was restarted without issue.

Optimization Activities

No optimization activities occurred at the ST018GWTP in April 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 121 pounds of GHG during April 2017 and treated 261,430 gallons of water, which was a decrease from March 2017 (169 pounds, treating 383,500 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 April 2017– Site ST018 Groundwater Treatment Plant

Summary of Groundwater Analytical Data for April 2017 - Site 0176 Groundwater Treatment Plant					
Constituent	Instantaneous Maximum* (µg/L)	Detection Limit (µg/L)	N/C	4 April 2017 (µg/L)	
				Influent	System Effluent
Fuel Related Constituents					
Methyl tert-Butyl Ether	6,400	0.15	0	52.0	2.33
Benzene	25,000 ^a	0.15	0	11.6	ND
Ethylbenzene	25,000 ^a	0.15	0	11.3	ND
Toluene	25,000 ^a	0.15	0	0.89	ND
Total Xylenes	25,000 ^a	0.15 – 0.30	0	13.9	ND
Total Petroleum Hydrocarbons – Gasoline	50,000 ^b	35	0	326	ND
Total Petroleum Hydrocarbons – Diesel	50,000 ^b	24	0	72.9 J	ND
Total Petroleum Hydrocarbons – Motor Oil	100,000	24	0	44.9 J	26.9 J
Other					
Acetone	NA	1.0	0	ND	1.74 J
1,2-Dichloroethane	20	0.15	0	0.60	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

NM = not measured this month

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

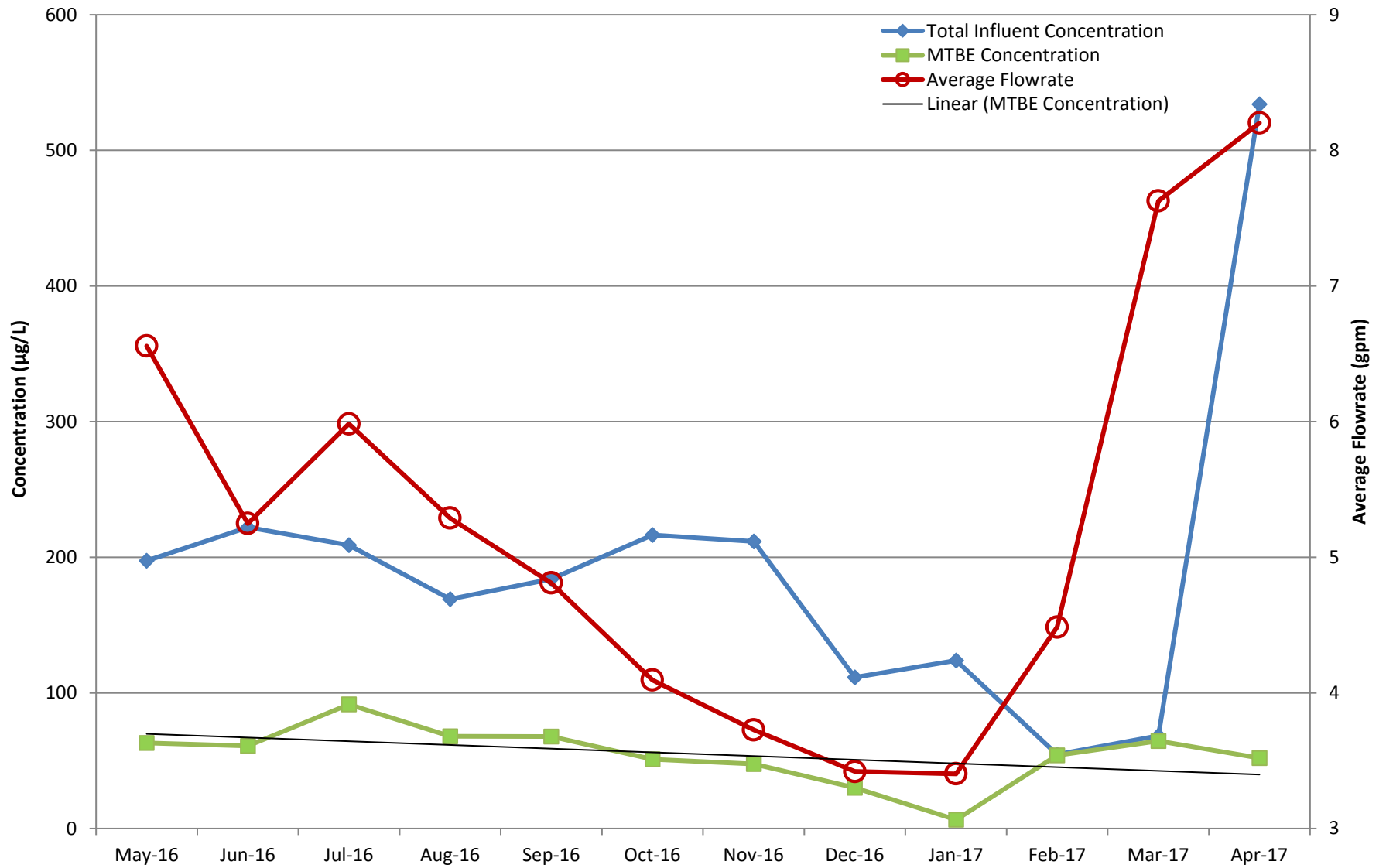
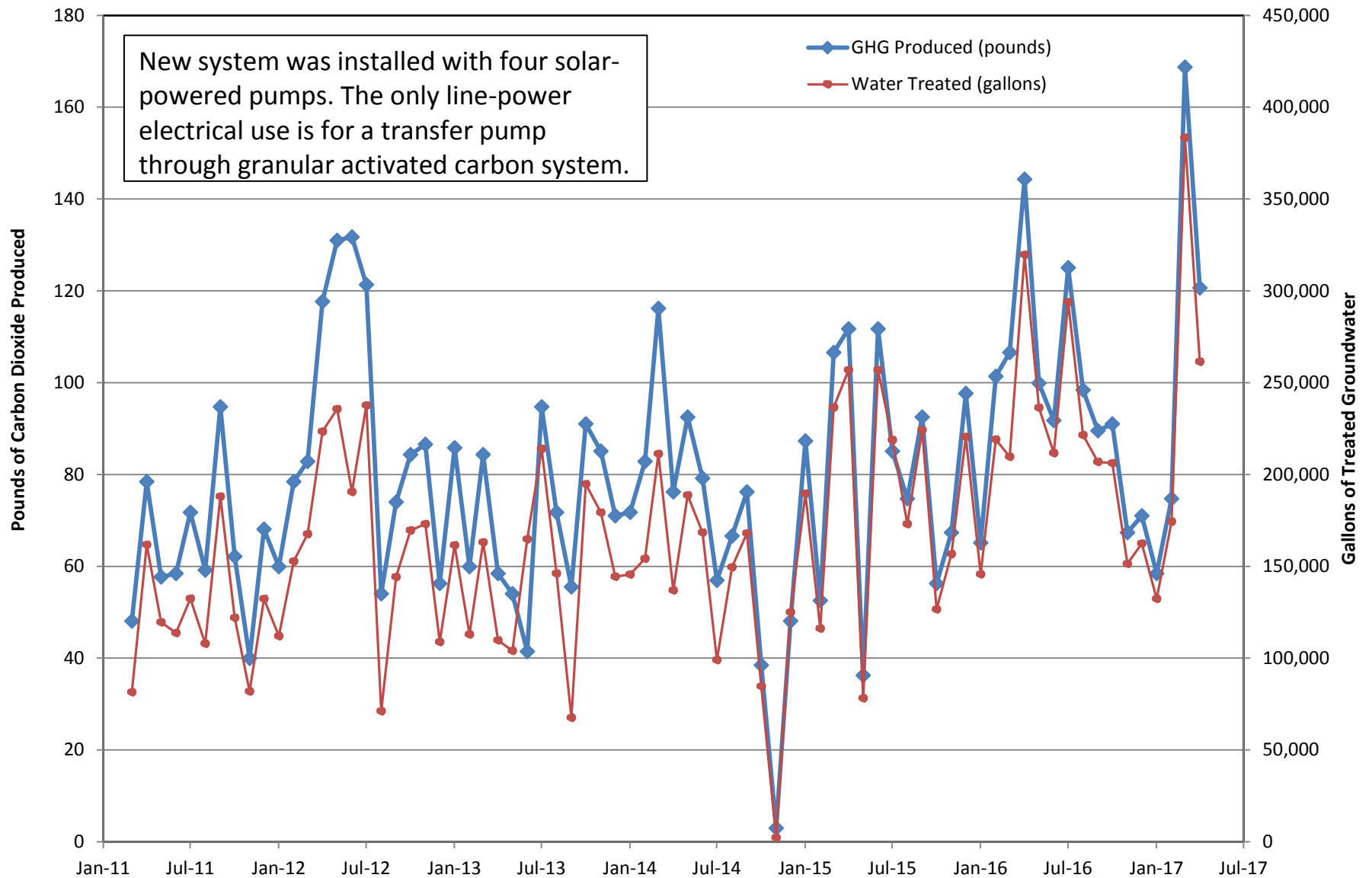


Figure 2

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



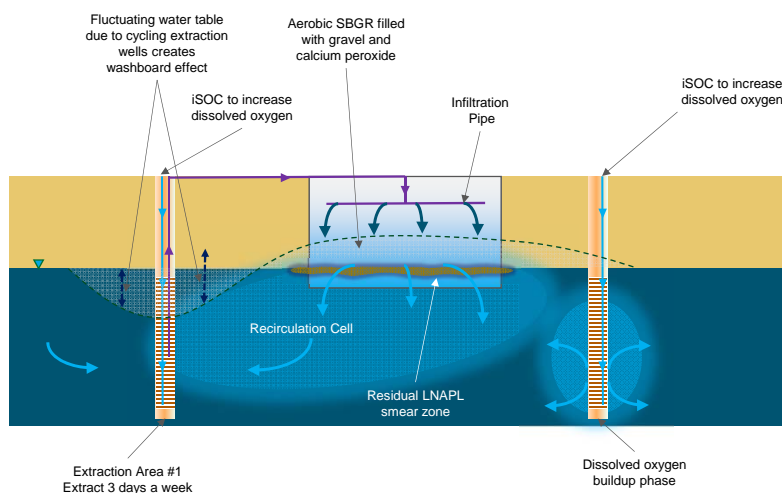
Travis AFB SD034 Aerobic SBGR Installation



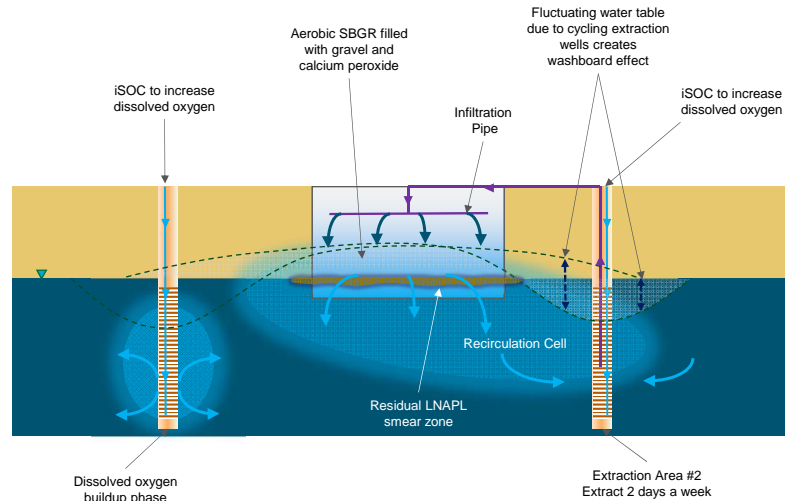
May 2017

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Aerobic “Washboard” SBGR (Phase 1)



Aerobic “Washboard” SBGR (Phase 2)



3

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Travis AFB Site SD034 Technology Demonstration

• Aerobic “Washboard” SBGR Trenches

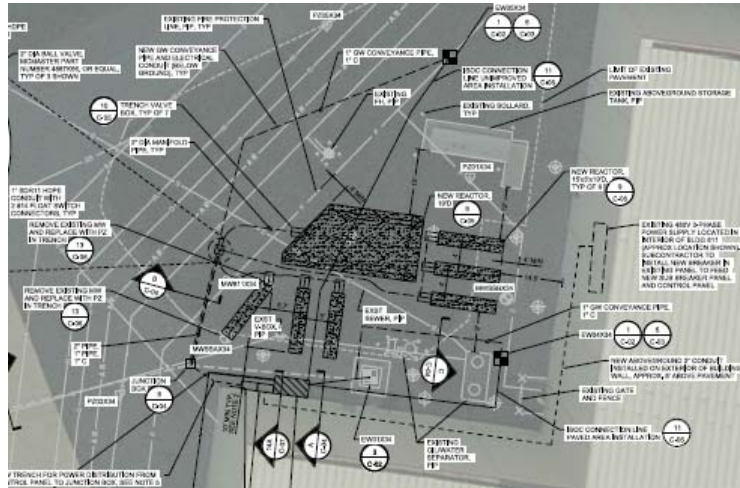
- Incorporated several aerobic processes to treat Stoddard solvent hydrocarbon source area and plume
- Adjacent to large hanger with complicated utilities



4

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Site SD034 Utility and Foundation Considerations



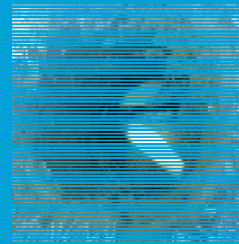
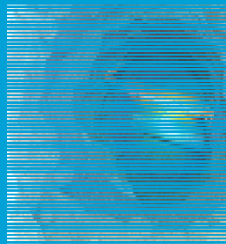
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Arrival of Potholing Equipment



Daylighting of Utilities



7

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Potholing Transects



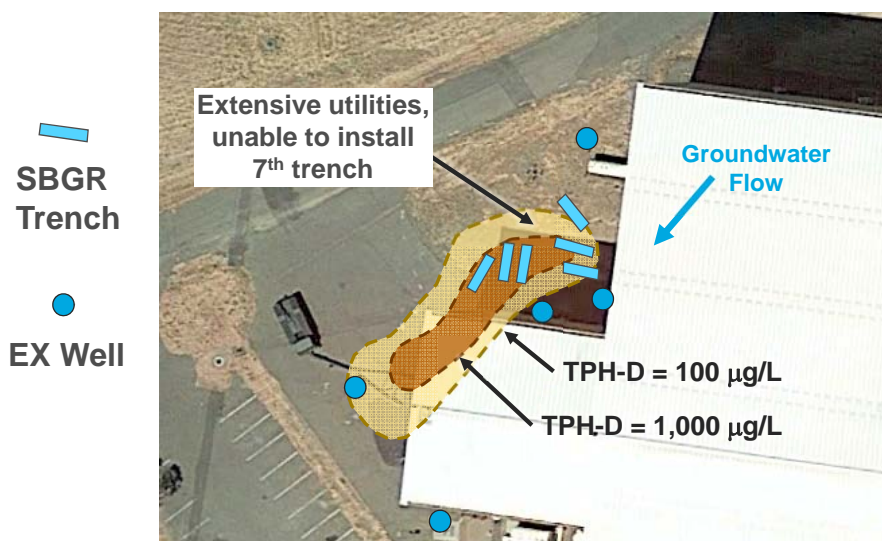
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Unloading Potholing IDW



Site SD034 Aerobic SBGR Demonstration



Excavating a Series of SBGR Trenches



11

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Backfill with Gravel, Calcium Peroxide, Vitamin Package, and Infiltration/Sparge Lines



12

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Installing Infiltration Lines



13

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Installing Valve Boxes



14

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Construction of Oxygen Shed



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Inside the Oxygen Shed



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Testing iSOC Prior to Installation



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Surface Completion



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Travis AFB Restoration Program

Program Update

RPM Meeting

May 17, 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

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***

Documents In-Progress

CERCLA

- Community Involvement Plan
- Site LF044 Investigation Work Plan
- Site FT004 POCO Soil Data Gap Investigation Work Plan
- ***SD034 Technology Demonstration Construction Completion Report***

Documents In-Progress

POCO

- POCO Evaluation/Closeout Report for DERA-funded oil/water separators OW051, OW053, and OW054
- SS014 POCO Technology Demonstration Construction Completion Report

Field Work In-Progress

CERCLA

- ***Q2 2017 GRIP Sampling Event***
- ***SS015 Optimization: Injection Well Installation***
- ***DP039 Down-gradient Monitoring Well Installation***
- ***SD036 Optimization: Injection Well Installation***
- ***SD031 Optimization: Injection Well Installation***

POCO

- None

Documents Planned

CERCLA

- 2016 Annual CAMU Monitoring Report Jun
- 2016 Annual GRISR Jun
- Data Gap Investigation Results, Technical Memorandum
for Soil, Sites SD033, SD043, SS046 Jul
- Site SS016 Data Gap Investigation Technical Memorandum TBD
- Work Plan for Fourth Five-year Review TBD

Documents Planned

POCO

- POCO Evaluation/Closure Report for DERA-funded Oil/Water Separators OW040, OW047, OW048, OW049, OW052, OW055, and OW057 TBD
- ST032 POCO Well Decommissioning and Site Closeout Technical Memorandum TBD

Field Work Planned

CERCLA

• SD031 Finish Soil Delineation (NE portion of site)	May
• FT004 EVO Optimization	May
• TS060 Removal Action	Jun
• SS015 EVO Optimization	Jun
• SD036 EVO Optimization	Jul
• SD031 EVO Optimization	Aug
• LF044 Sediment Sampling	2017

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

Field Work Planned

POCO

- OW055 Sidewalk Repairs May
- OW056 Site Excavation/Closure Jun
- FT004 POCO Soil Data Gaps Investigation Jul

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
 - Area below SBGR has been initially reduced to non-detect, but too early to evaluate performance data
- 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

* SBGR = Subgrade Biogeochemical Reactor

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
 - May evaluate optimization of GETs in southern portion of site

Technology Demonstration Projects (2)

- 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, but COC concentrations have declined. Additional EVO injection planned for 2017 with nanoEVO to determine if this can enhance TOC dispersal

Technology Demonstration Projects (3)

- 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
 - 1,1-DCE (primary COC) concentrations have reduced by 57% (sum of key wells within TD area)
 - Total Molar concentration (sum of CVOCs) has reduced by 49% (sum of key wells within TD area)
 - Recirculation through chimneys has been successful relative to our design assumptions

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 Memorandum²¹

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