

**Travis Air Force Base
Environmental Restoration Program
Restoration Program Manager's
Meeting Minutes**

16 April 2014, 0930 Hours

Mr. Mark Smith, of the Air Force Civil Engineer Center (AFCEC) Restoration Support Team, conducted the Restoration Program Manager's (RPM) meeting in Building 248, on 16 April 2014 at 0930 hours, at Travis AFB, California. Attendees included:

- Mark Smith AFCEC/CZOW
- Glenn Anderson AFCEC/CZOW
- Lonnie Duke AFCEC/CZOW
- Erin Hernandez Travis AFB 60 AMW/JA
- Dezso Linbrunner USACE-Omaha
- William Hall AFCEC/CZRW
- Nadia Hollan Burke United States Environmental Protection Agency
(via telephone) (USEPA)
- Adriana Constantinescu California Regional Water Quality Control Board
(RWQCB)
- Ben Fries California Department of Toxic Substances Control
(DTSC)
- Mike Wray CH2M HILL

Handouts distributed at the meeting, and presentations included:

- Attachment 1 Meeting Agenda
- Attachment 2 Master Meeting and Document Schedule
- Attachment 3 SBBGWTP Monthly Data Sheet (March 2014)
- Attachment 4 CGWTP Monthly Data Sheet (March 2014)
- Attachment 5 ST018 Monthly Data Sheet (March 2014)
- Attachment 6 Presentation: Groundwater Technology Demonstrations
- Attachment 7 Presentation: Program Update: Activities Completed, In Progress and Upcoming

1. ADMINISTRATIVE

A. Previous Meeting Minutes

The 19 March RPM meeting minutes were approved and finalized as written.

B. Action Item Review.

Action items from March were reviewed.

Action item 1 will remain open: AFCEC's Travis Restoration Team and Travis AFB will continue to pursue opportunities for the beneficial reuse of treated water. AFCEC is in agreement with using Defense Environmental Restoration Account (DERA) funds under the authority of a "net-zero energy policy" for the Air Force for the beneficial reuse of treated groundwater. Current possibilities include: Rerouting treated water from the central plant to the duck pond or as irrigation as an energy reduction project with the intent of reducing on-base water usage. Due date will remain TBD to ensure this action item remains visible. 16 April 2014: No update.

Action item 2 is closed. Travis AFB recommended changing the RPM date from 21 May 2014 to 14 May 2014 pending availability of DTSC, RWQCB and EPA.

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 14 May 2014. The May RPM meeting was moved up one week due to the Battelle Conference. Mr. Linbrunner said he would not be able to attend due to a conflict in his schedule. The April 2014 RAB meeting was officially postponed. Mr. Smith said he did contact all the RAB members regarding the postponement and received consensus. Mr. Anderson said that Travis AFB may schedule a RAB meeting earlier than the next scheduled October RAB.

Travis AFB Master Document Schedule

— Groundwater Record of Decision (ROD): No change to the schedule. Travis AFB just received a letter from EPA requesting an additional thirty-day extension for approval of the final ROD. This second 30-day extension would push the due date to 21 May 2014. Mr. Smith stated that he will approve the extension request but will need time to draft the approval letter. The Travis

AFB Wing Commander signature is on the ROD. The next in line for signature is EPA, then DTSC or RWQCB depending on the authorized signer availability.

- Travis Air Force Base Uniform Federal Policy-Quality Assurance Project Plan (UFP-QAPP): New document. New dates populated. Mr. Anderson gave Mr. Fries a brief history of the existing Travis QAPPs, and the background on the Uniform Federal Policy-Quality Assurance Project Plan (UFP-QAPP) document.
- Site SD037 GW Remedial Design/Remedial Action Work Plan: New document, all dates are TBD. Mr. Anderson explained that the new work plans (WPs) were added to the MMDS in response to EPA request for a schedule of upcoming documents requiring regulatory agency review. The due dates for reviews of remedial design/remedial action (RD/RA) WPs will be populated once the ROD is signed. The new WPs will go out Draft to Agencies in a staggered schedule as to not inundate the regulatory agencies or Travis AFB resources. Mr. Anderson said Travis AFB utilizes USACE professional staff to review the predraft documents.
- Site SD036 Remedial Design/Remedial Action Work Plan: New document, all dates are TBD.
- Site SS015 GW Remedial Design/Remedial Action Work Plan: New document, all dates are TBD.
- Site SS016 GW Remedial Design/Remedial Action Work Plan: New document, all dates are TBD.
- Potrero Hills Annex: (FS, PP, and ROD): No change to the schedule.
- Site CG508 POCO Work Plan: No change to the schedule. This is a petroleum-only site that receives RWQCB oversight. There is a presentation scheduled after the RPM meeting this afternoon for RWQCB. Mr. Anderson invited EPA and DTSC to stay for the presentation for informational purposes.
- Site FT004 Treatment Demonstration Work Plan: New document. New dates populated. (Mr. Anderson gave a presentation of the treatment and/or technology demonstration approach during the RPM meeting)
- Site DP039 Lead Excavation Technical Memorandum: New document. New dates populated. Mr. Anderson gave a brief history on Site DP039 lead contamination in shallow soil. This Land Use Control (LUC) site is where the former battery shop was located. When soil was removed to install the in situ bioreactor the lead-contaminated soil was removed and disposed of in a landfill. This technical memorandum will document how the soil was excavated and disposed of. Ms. Burke asked if there was an approved WP before the bioreactor was installed? Mr. Anderson said yes and that the WP also stated the lead-contaminated soil would be relocated to an appropriate landfill. Mr. Smith said that Travis AFB will provide electronic copies of the

DP039 Bioreactor WP to the regulatory agencies, on request, when the draft tech memo is submitted.

- Site SD031 Treatment Demonstration Work Plan: New document. New dates populated.
- Site SS014 Technology Demonstration Work Plan: New document. New dates populated.
- Site TA500 Investigation Work Plan: New document. New dates populated. This is a fluoride contaminated site resulting of a spill of hydrofluoric acid. The hydrofluorosilicic acid surface spill has percolated down to the groundwater. The site has not been tested for some time, and samples need to be collected to see if the contamination is still there and if more investigation work is needed. This site was formerly a Compliance site that has been transferred to ERP.
- Explanation of Significant Differences to the NEWIOU Soil, Sediment, and Surface Water Record of Decision: New document. New dates populated.
- Explanation of Significant Differences to the Soil Record of Decision for the WABOU: New document. New dates populated.
- Quarterly Newsletter (April 2014): The Final Due date was changed to reflect the actual date the Newsletter went final.
- 2013 Annual Groundwater Remediation Implementation Status Report (GRISR): Draft to agencies date was changed to 25 April 2014. No change to the rest of the dates.
- Kinder Morgan LF044 Land Use Control Report: No change to the schedule.
- CAMU Inspection Annual Report: No change to the schedule.

2. CURRENT PROJECTS

Treatment Plant Operation and Maintenance Update

South Base Boundary Groundwater Treatment Plant (see Attachment 3)

The South Base Boundary Groundwater Treatment Plant (SBBGWTP) performed at 76% uptime, and 1.8 million gallons of groundwater were extracted and treated during the month of March 2014. All of the treated water was discharged to Union Creek. The average flow rate for the SBBGWTP was 38.6 gallons per minute (gpm). Electrical power usage was 5,399 kWh and approximately 7,397 pounds of CO₂ were created (based on DOE calculation). Approximately 0.3 pounds of volatile organic

compounds (VOCs) were removed in March. The total mass of VOCs removed since startup of the system is 446 pounds.

Optimization Activities: No optimization activities are reported for the month of March.

Mr. Fries indicated he thought use of the groundwater pump and treat system seemed futile in light of the low monthly VOC mass removed. Mr. Anderson said it used to make a lot of sense, we are “victims of our own success”. That is why getting the ROD signed is so important in addition to the demonstration projects.

Central Groundwater Treatment Plant (see Attachment 4)

The Central Groundwater Treatment Plant (CGWTP) performed at 100% uptime with approximately 1.6 million gallons of groundwater extracted and treated during the month of March 2014. All treated water was discharged to the storm drain. The average flow rate for the CGWTP was 34.2 gpm. Electrical power usage was 2,771 kWh for all equipment connected to the Central Plant, and approximately 3,796 pounds of CO₂ were generated. Approximately 5.3 pounds of VOCs were removed from groundwater by the treatment plant in March. The total mass of VOCs removed since the startup of the system is 11,364 pounds.

Optimization Activities for WTTP: The WTTP remains off line since it was shut down in April 2010 for the ongoing rebound study. No additional optimization activities to report for the month of March.

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

North Groundwater Treatment Plant (treatment plant was turned off on 8 February 2014 due to standing water in the seasonal vernal pool at Subarea LF007C, per U.S. Fish and Wildlife Service requirements)

Site ST018 Groundwater (MTBE) Treatment Plant (see Attachment 5)

The Site ST018 (MTBE) Treatment Plant (ST018 GWTP) performed at 100% uptime with approximately 211,200 gallons of groundwater extracted and treated during the month of March 2014. All treated water was diverted to the storm drain. The average flow rate for the ST018 GWTP was 5.4 gpm. Electrical power usage for the month was 157 kWh for all equipment connected to the ST018 GWTP plant, which equates to the creation of approximately 215 pounds of CO₂. Approximately 0.04 pounds of BTEX, MTBE and TPH were removed from groundwater in March from the treatment plant, all of which is attributed to MTBE removal. The total BTEX, MTBE and TPH mass removed since the startup of the system is 26.1pounds.

Note: Electrical power use is only for the alarm system and a pump that pushes water through the GAC vessels. The other pumps in the system are all solar powered.

Optimization Activities for ST018: No optimization activities to report for the month of March.

Presentations:

Demonstration Projects: (see attachment 6)

Mr. Anderson reported on the Demonstration Projects. (see attachment 6 for details)

Previous Demonstration Sites: Sites where previous demonstrations have been applied on Travis AFB and the technologies used were:

- SS015 – Emulsified Vegetable Oil (EVO) Injection.
- SS016 – In Situ Bioreactor.
- SD036 – EVO Injection.
- SD037 – EVO Injection.
- DP039 – EVO Biobarrier and In Situ Bioreactor.

Travis AFB has conducted past demonstration projects in support of the remedy selection process for the upcoming Groundwater Record of Decision (ROD). In approximately 2007/2008, Travis AFB began to explore different alternatives to “pumping and treating”. An interim remedy that has outlived its usefulness on Base. “We were getting less contamination for every gallon of groundwater pumped. The cost for treatment was increasing and the amount of contamination removed was going down. Plus Travis AFB wanted to explore green and sustainable technologies to achieve cleanup levels.” stated Mr. Anderson.

Travis AFB consulted with the regulatory agencies to receive input and approval of the demonstration and technology projects. They are called demonstration projects because they were never designed to actually clean-up the entire groundwater contamination. The purpose was to provide proof of concept that the technologies work. The EVO was injected in the highest TCE concentration levels on base. The thought was if the EVO works to effectively reduce the highest levels of concentration, then EVO will also work with lower concentrations. The demonstration projects that were conducted in these sites proved to be successful.

When the draft Groundwater ROD was issued, Travis AFB had a reasonable expectation that these technologies were going to clean up the groundwater contamination. Once the ROD is signed, Travis AFB will begin implementing/expanding these types of technologies. However, there are still complexities and unknowns with the various innovative technologies that need to be worked out and demonstrated to ensure “full scale” effectiveness.

Planned Demonstration Sites:

- Site FT004: Proposed EVO recirculation. Site conditions: poor distribution (tight formation) no previous injections, multiple wetlands.
- Site SS014: Proposed sulfate reduction – anaerobic biodegradation. Site conditions: TPH/BTEX contaminants, excavate above plume and place sulfate material at or near water table. POCO site for RWQCB review.
- Site SD031: Proposed EVO recirculation. Site conditions: poor distribution, no previous injections, 1,1-DCE is primary contaminant, wetlands.

Requirements:

- EVO recirculation: Demonstration of treatment of EVO recirculation requires a site where injections have not taken place and soil has a high clay content. This demonstration should prove effective on sites where subsurface substrate distribution is difficult due to tight, high clay soils.
- Sulfate reduction/biodegradation: Demonstration of anaerobic sulfate reduction requires a POCO site where the target zone can be excavated.

Travis AFB has proven that some of these concepts work. And once the remedy is selected, the ROD is signed and the remedial actions are implemented, the next step is to determine how to make the system/process better to achieve clean-ups quicker/better. This is done through optimization which ideally increases both the efficiency and the effectiveness of the cleanup. There will come a point when the concentrations in groundwater plumes will become low enough that pump and treat is no longer efficient nor effective. FT004 and SD031 are perfect candidates for an EVO recirculation demonstration, the plumes are small and perfect for testing recirculation to accelerate the cleanup process.

Ms. Constantinescu said that RWQCB approved this process at Moffett field in an area now occupied by NASA. The test was conducted by Stanford University and was published in approximately 2003. The lesson learned from the project was that it was successful. However for the whole plume to be cleaned up it was necessary to have the EVO injected in a transect perpendicular to the plume. Arizona University also conducted the same type of study before 2006 at Port Hueneme.

Ms. Burke said she does have concerns/questions regarding how these demonstration projects fit in with ROD requirements and support the RD/RA process and would like to discuss this topic further. A tentative date has been set to discuss with Mr. Smith, Mr. Anderson and Mr. Duke in the afternoon of 6 May 2014.

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

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

Newly Completed Documents: 2013 CAMU Inspection Annual Report.

Newly Completed Field Work: None.

In-Progress Documents: Groundwater Record of Decision (ROD), Kinder Morgan LF044 Land Use Control Report, CG508 POCO Work Plan.

In-Progress Field Work: Biological Resource Assessment, 2014 Annual GRIP Sampling Event.

Upcoming Documents: 2013 Annual GRISR, ESD to WABOU Soil ROD, ESD to NEWIOU Soil, Sediment, & Surface Water ROD, SD031 Treatment Demonstration Work Plan, Travis AFB UFP-QAPP, FT004 Treatment Demonstration Work Plan, SS014 Technology Demonstration Work Plan, DP039 Lead Excavation Technical Memo, TA500 Investigation Work Plan, SS015 GW RD/RA Work Plan, SS016 GW RD/RA Work Plan, SD036 RD/RA Work Plan, SD037 GW RD/RA Work Plan.

Upcoming Field Work: Old Skeet Range Characterization Sampling.

4. New Action Item Review

Travis AFB will set up a meeting with EPA to discuss the role of upcoming groundwater technology demonstration projects in the RD/RA process.

5. PROGRAM/ISSUES/UPDATE

None.

6. Action Items

Item #	Responsible	Action Item Description	Due Date	Status
1.	Travis AFB	AFCEC's Travis Restoration Team and Travis AFB will continue to pursue opportunities for the beneficial reuse of treated water. AFCEC is in agreement with using Defense Environmental Restoration Account (DERA) funds under the authority of a "net-zero energy policy" for the Air Force for the beneficial reuse of treated groundwater. Current possibilities include: Rerouting treated water from the central plant to the	TBD	Open

		duck pond or as irrigation as an energy reduction project with the intent of reducing on-base water usage. Due date will remain TBD to ensure this action item remains visible.		
2	Travis AFB	Travis AFB will set up a meeting with EPA to discuss the role of upcoming groundwater technology demonstration projects in the RD/RA process.	6 May 2014	New

TRAVIS AIR FORCE BASE
ENVIRONMENTAL RESTORATION PROGRAM
RESTORATION PROGRAM MANAGER'S MEETING
BLDG 248 Conference Room
16 April 2014, 9:30 A.M.
AGENDA

1. ADMINISTRATIVE

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

2. CURRENT PROJECTS

- A. TREATMENT PLANT OPERATION AND MAINTENANCE UPDATE

3. PRESENTATION

- A. GROUNDWATER TECHNOLOGY DEMONSTRATIONS
- B. PROGRAM UPDATE: ACTIVITIES COMPLETED, IN PROGRESS AND UPCOMING

4. NEW ACTION ITEM REVIEW

5. PROGRAM/ISSUES/UPDATE

NOTES: AFTER THE RPM MEETING WE WILL HOLD A SEPARATE MEETING WITH THE WATER BOARD REPRESENTATIVE TO DISCUSS THE POTENTIAL LOW THREAT CLOSURE OF POCO SITES AND THE CG508 WORK PLAN. ALL OTHER PARTICIPANTS ARE WELCOME TO ATTEND.

(2014)
Annual Meeting and Teleconference Schedule

Monthly RPM Meeting ¹ (Begins at 9:30 a.m.)	RPM Teleconference (Begins at 10:00 a.m.)	Restoration Advisory Board Meeting (Begins at 7:00 p.m.) (Poster Session at 6:30 p.m.)
01-22-14	—	—
02-19-14	—	—
03-19-14	—	—
04-16-14	—	04-17-14 ²
05-21-14	—	—
06-18-14	—	—
07-23-14	—	—
08-20-14	—	—
09-17-14	—	—
10-23-14 (Thur 2:00 PM)	—	10-23-14
11-19-14	—	—
—	—	—

¹ Note: Meetings will be held the third Wednesday of each month unless otherwise noted.

²Note: Postponed until ROD signed

Travis AFB Master Meeting and Document Schedule

PRIMARY DOCUMENTS			
Life Cycle	Groundwater Record of Decision Travis, Glenn Anderson CH2M HILL, Leah Waller	Travis Air Force Base Uniform Federal Policy-Quality Assurance Project Plan Travis, Glenn Anderson CH2M HILL, Bernice Kidd	Site SD037 GW Remedial Design/Remedial Action Work Plan Travis AFB, Glenn Anderson CH2M HILL, Tony Chakurian
Scoping Meeting	01-24-07 (11-30-11)	NA	NA
Predraft to AF/Service Center	11-28-12	05-12-14	TBD
AF/Service Center Comments Due	12-12-12	05-26-14	TBD
Draft to Agencies	01-02-13 ¹	06-09-14	TBD
Draft to RAB	01-02-13 ¹	06-09-14	TBD
Agency Comments Due	03-03-13 (04-05-13)	07-09-14	TBD
Response to Comments Meeting	11-20-13	07-23-14	TBD
Public Comment Period	NA	NA	NA
Public Meeting	NA	NA	NA
Response to Comments Due	02-19-14	08-06-14	TBD
Draft Final Due	02-19-14	08-19-14	TBD
Final Due	04-21-14	09-18-14	TBD

¹Sent Appendix A to agencies for review on 07-31-13

Travis AFB Master Meeting and Document Schedule

PRIMARY DOCUMENTS			
Life Cycle	Site SD036 Remedial Design/Remedial Action Work Plan Travis AFB, Glenn Anderson CH2M HILL, Tony Chakurian	Site SS015 GW Remedial Design/Remedial Action Work Plan Travis AFB, Glenn Anderson CH2M HILL, Tony Chakurian	Site SS016 GW Remedial Design/Remedial Action Work Plan Travis AFB, Glenn Anderson CH2M HILL, Tony Chakurian
Scoping Meeting	NA	NA	NA
Predraft to AF/Service Center	TBD	TBD	TBD
AF/Service Center Comments Due	TBD	TBD	TBD
Draft to Agencies	TBD	TBD	TBD
Draft to RAB	TBD	TBD	TBD
Agency Comments Due	TBD	TBD	TBD
Response to Comments Meeting	TBD	TBD	TBD
Public Comment Period	NA	NA	NA
Public Meeting	NA	NA	NA
Response to Comments Due	TBD	TBD	TBD
Draft Final Due	TBD	TBD	TBD
Final Due	TBD	TBD	TBD

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 CG508 POCO Work Plan Travis AFB, Glenn Anderson CH2M HILL, Tony Chakurian	Site FT004 Treatment Demonstration Work Plan Travis AFB, Glenn Anderson CH2M HILL, Tony Chakurian	Site DP039 Lead Excavation Technical Memorandum Travis AFB, Glenn Anderson CH2M HILL, Loren Krook
Scoping Meeting	NA	NA	NA
Predraft to AF/Service Center	02-25-14	04-21-14	05-14-14
AF/Service Center Comments Due	03-11-14	05-21-14	05-28-14
Draft to Agencies	04-01-14	06-04-14	06-11-14
Draft to RAB	04-01-14	06-04-14	06-11-14
Agency Comments Due	05-01-14	07-07-14	07-11-14
Response to Comments Meeting	05-21-14	07-23-14	07-23-14
Response to Comments Due	06-04-14	08-06-14	08-11-14
Draft Final Due	NA	NA	NA
Final Due	06-04-14	08-06-14	08-11-14
Public Comment Period	NA	NA	NA
Public Meeting	NA	NA	NA

Travis AFB Master Meeting and Document Schedule

SECONDARY DOCUMENTS			
Life Cycle	Site SD031 Treatment Demonstration Work Plan Travis AFB, Glenn Anderson CH2M HILL, Tony Chakurian	Site SS014 Technology Demonstration Work Plan Travis AFB, Glenn Anderson CH2M HILL, Tony Chakurian	Site TA500 Investigation Work Plan Travis AFB, Glenn Anderson CH2M HILL, Tony Chakurian
Scoping Meeting	NA	NA	NA
Predraft to AF/Service Center	05-01-14	05-09-14	05-22-14
AF/Service Center Comments Due	05-15-14	05-23-14	06-05-14
Draft to Agencies	05-29-14	06-06-14	06-19-14
Draft to RAB	05-29-14	06-06-14	06-19-14
Agency Comments Due	06-30-14	07-07-14	07-21-14
Response to Comments Meeting	07-23-14	07-23-14	TBD
Response to Comments Due	08-15-14	08-08-14	TBD
Draft Final Due	NA	NA	NA
Final Due	08-15-14	08-08-14	TBD
Public Comment Period	NA	NA	NA
Public Meeting	NA	NA	NA

Travis AFB Master Meeting and Document Schedule

SECONDARY DOCUMENTS		
Life Cycle	Explanation of Significant Differences to the NEWIOU Soil, Sediment, and Surface Water Record of Decision Travis AFB, Glenn Anderson CH2M HILL, Loren Krook	Explanation of Significant Differences to the Soil Record of Decision for the WABOU Travis AFB, Glenn Anderson CH2M HILL, Loren Krook
Scoping Meeting	NA	NA
Predraft to AF/Service Center	04-23-14	04-23-14
AF/Service Center Comments Due	05-07-14	05-07-14
Draft to Agencies	05-21-14	05-21-14
Draft to RAB	05-21-14	05-21-14
Agency Comments Due	06-20-14	06-20-14
Response to Comments Meeting	07-23-14	07-23-14
Response to Comments Due	08-07-14	08-07-14
Draft Final Due	TBD	TBD
Final Due	08-07-14	08-07-14
Public Comment Period	NA	NA
Public Meeting	NA	NA

Travis AFB Master Meeting and Document Schedule

INFORMATIONAL DOCUMENTS				
Life Cycle	Quarterly Newsletters (April 2014) Travis, Glenn Anderson	2013 Annual Groundwater Remediation Implementation Status Report Travis AFB, Lonnie Duke CH2M HILL, Royer/Berwick	Kinder Morgan Site LF044 Land Use Control Report Travis AFB, Glenn Anderson AMEC, Nick Ricono	CAMU Inspection Annual Report Travis AFB, Lonnie Duke Gilbane, Rachel Hess
Scoping Meeting	NA	NA	NA	NA
Predraft to AF/Service Center	NA	03-24-14	NA	01-31-14
AF/Service Center Comments Due	NA	04-10-14	NA	02-10-14
Draft to Agencies	03-25-14	04-25-14	09-18-13	02-19-14
Draft to RAB	NA	04-25-14	09-18-13	02-19-14
Agency Comments Due	04-08-14	05-26-14	10-18-13	03-19-14
Response to Comments Meeting	TBD	TBD	TBD	03-19-14
Response to Comments Due	04-11-14	06-11-14	TBD	03-25-14
Draft Final Due	NA	NA	NA	NA
Final Due	04-11-14	06-11-14	TBD	04-09-14
Public Comment Period	NA	NA	NA	NA
Public Meeting	NA	NA	NA	NA

South Base Boundary Groundwater Treatment Plant Monthly Data Sheet

Report Number: 163

Reporting Period: 27 February 2014 – 31 March 2014

Date Submitted: 10 April 2014

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 March 2014 reporting period.

Table 1 – Operations Summary – March 2014			
Initial Data Collection:	2/27/2014 14:00	Final Data Collection:	3/31/2014 14:00
Operating Time:	Percent Uptime:	Electrical Power Usage:	
SBBGWTP: 580 hours	SBBGWTP: 76%	SBBGWTP: 5,399 kWh (7,397 lbs CO ₂ generated ^a)	
Gallons Treated: 1.8 million gallons		Gallons Treated Since July 1998: 852 million gallons	
Volume Discharged to Union Creek: 1.8 million gallons			
VOC Mass Removed: 0.34 lbs^b		VOC Mass Removed Since July 1998: 446 lbs	
Rolling 12-Month Cost per Pound of Mass Removed: \$12,824 ^c			
Monthly Cost per Pound of Mass Removed: \$16,976			
lbs = pounds			
^a Based on Department of Energy estimate that 1 kilowatt hour generated produces 1.37 pounds of GHG.			
^b Calculated using March 2014 EPA Method SW8260B 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,b}							
FT005^c				SS029		SS030	
EW01x05	2.1	EW736x05	Offline	EW01x29	1.1	EW01x30	6.0
EW02x05	2.0	EW737x05	Offline	EW02x29	-- ^d	EW02x30	2.2
EW03x05	Offline	EW742x05	Offline	EW03x29	2.3	EW03x30	8.9
EW731x05	Offline	EW743x05	Offline	EW04x29	9.3	EW04x30	36.5
EW732x05	Offline	EW744x05	Offline	EW05x29	-- ^d	EW05x30	19.0
EW733x05	Offline	EW745x05	Offline	EW06x29	5.2	EW06x30	-- ^d
EW734x05	-- ^d	EW746x05	Offline	EW07x29	1.6	EW711x30	-- ^d
EW735x05	-- ^d						
FT005 Total: 4.1				SS029 Total: 19.5		SS030 Total: 72.6	
SBBGWTP Average Monthly Flow^c: 38.6 gpm							
^a Extraction well flow rates are based on instantaneous weekly readings collected at the end of the month. ^b The average SBBGWTP groundwater flow rate was calculated using the Union Creek Discharge Totalizer and dividing it by the total time in the reporting period. ^c Most extraction wells at FT005 were taken offline in accordance with the <i>2008 Annual Remedial Process Optimization Report for the Central Groundwater Treatment Plant, North Groundwater Treatment Plant, and South Base Boundary Groundwater Treatment Plant</i> . ^d Troubleshooting continued in February 2014 for wells that experienced downtime. gpm – gallons per minute Recharge –not pumping while the well recharges. 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		Restart		Cause
	Date	Time	Date	Time	
SBBGWTP	12 March 2014	10:30	12 March 2014	18:00	System shut down to facilitate SCADA maintenance.
SBBGWTP	19 March 2014	15:00	25 March 2014	09:00	System shut down for carbon changeout. Restarted to collect confirmation samples.
SBBGWTP	25 March 2014	14:00	27 March 2014	16:00	System shut down to wait for confirmation sample results prior to restart with new carbon.
SBBGWTP = South Base Boundary Groundwater Treatment Plant					

Summary of O&M Activities

Monthly groundwater samples were collected at the SBBGWTP on 4 March 2014. Sample results are presented in Table 4. The total VOC concentration (23.03 µg/L) in the influent sample has decreased since the February 2014 sample (29.8.2 µg /L) was collected. Chloroform (0.43 J µg/L), cis-1,2-DCE (1.3 µg/L), and TCE (21.3 µg/L) were detected at the influent sampling location in March 2014. Chloroform (0.31 J µg/L), cis-1,2-DCE (2.2 µg/L), and TCE (5.5 µg/L) were also detected at the midpoint sampling location. No contaminant concentrations were detected at the effluent sampling location during the monthly sampling event.

A carbon change out for the primary vessel at the SBBGWTP was completed on 20 March 2014. Following this change out, the vessels were reconfigured to have the vessel with the new carbon be the secondary vessel, and the vessel with the older carbon be the primary vessel. The treatment system remained offline until confirmation sample results were received on 27 March 2014. The effluent sample collected following carbon change out activities contained TCE at a concentration of 0.26 µg/L and cis-1,2-DCE at a concentration of 0.22 µg/L in March 2014. No contaminant concentrations were detected at the midpoint sampling location. Table 5 presents the sampling results from the 25 March 2014 sampling event.

Prior to change out activities, monthly samples did not contain detectable contaminant concentrations. After the change out, the effluent sample represented a location immediately after the new carbon. As such, contaminant concentrations in groundwater having passed through new carbon is likely an anomalous finding. An additional set of samples will be collected on 1 April 2014 to compare with these startup samples. Neither contaminant detected in the effluent process stream exceeded the effluent limitations (5 µg/L) established in the SBBGWTP Operation and Maintenance manual. The SBBGWTP was restarted on 27 March 2014.

Figure 1 presents a plot of influent concentrations and average flow at the SBBGWTP over the past twelve (12) months. The average flow rate at the SBBGWTP decreased in March 2014 to 38.6 gpm from an average of 57.0 gpm in February 2014. Extraction wells EW05x30, EW711x30, EW734x05, and EW735x05 registered some down time in March 2014 due to widespread freeze damage and troubleshooting remains ongoing. Work to replace the pump and piping that suffered freeze damage at EW05x30 was completed on 20 March 2014. New pumps have been ordered for extraction wells EW711x30 and EW735x05 and will be installed in April.

Additional work on the SBBGWTP SCADA system was performed in March to establish communication between the FT005 remote PLC and the SBBGWTP main PLC. Communication is expected to be restored in April 2014.

Troubleshooting activities on 25 March, 2014 identified a malfunctioning pump at EW711x30. The pump was removed and a replacement ordered. The new pump is expected to arrive in April 2014, at which time it will be installed at EW711x30, and the well brought back on line. Additionally, wellhead piping at EW05x30 was replaced on 25 March, 2014, and the well was brought back on line following this repair.

The pump at EW734x05 had malfunctioned, and the damage to this pump was likely due to the frequent cycling of pump power. The pump had previously drawn the well water down too fast, which in turn shut off the pump. To help remedy this issue, a smaller pump will be installed as a replacement in order to maintain consistent operation without frequent power cycling. This pump is expected to be installed in April 2014.

Optimization Activities

No optimization activities were performed in March 2014.

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 SBBGWTP. The SBBGWTP produced approximately 7,397 pounds of GHG during March 2014. This is a decrease from usage during February 2014 and is likely the result of downtime that occurred to facilitate carbon changeout. GHG production at the SBBGWTP during March 2014 is consistent with expected monthly usage at the SBBGWTP.

TABLE 4

Summary of Groundwater Analytical Data for March 2014 – South Base Boundary Groundwater Treatment Plant

Constituent	Instantaneous Maximum ^a (µg/L)	Detection Limit (µg/L)	N/C	4 March 2014 (µg/L)		
				Influent	Midpoint	Effluent
Halogenated Volatile Organics						
Carbon Tetrachloride	0.5	0.14	0	ND	ND	ND
Chloroform	5.0	0.16	0	0.43 J	0.31 J	ND
1,1-Dichloroethane	5.0	0.50	0	ND	ND	ND
1,2-Dichloroethane	0.5	0.15	0	ND	ND	ND
1,1-Dichloroethene	5.0	0.19	0	ND	ND	ND
cis-1,2-Dichloroethene	5.0	0.19	0	1.3	2.2	ND
trans-1,2-Dichloroethene	5.0	0.33	0	ND	ND	ND
Methylene Chloride	5.0	0.66	0	ND	ND	ND
Tetrachloroethene	5.0	0.21	0	ND	ND	ND
1,1,1-Trichloroethane	5.0	0.14	0	ND	ND	ND
1,1,2-Trichloroethane	5.0	0.20	0	ND	ND	ND
Trichloroethene	5.0	0.19	0	21.3	5.5	ND
Vinyl Chloride	0.5	0.18	0	ND	ND	ND
Non-Halogenated Volatile Organics						
Benzene	1.0	0.17	0	ND	ND	ND
Ethylbenzene	5.0	0.22	0	ND	ND	ND
Toluene	5.0	0.14	0	ND	ND	ND
Xylenes	5.0	0.23 – 0.5	0	ND	ND	ND
Other						
Total Petroleum Hydrocarbons – Gasoline	50	8.5	0	NM	NM	ND
Total Petroleum Hydrocarbons – Diesel	50	50	0	NM	NM	ND
Total Suspended Solids (mg/L)	NE	1.0	0	6 J	NM	NM

^a 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

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

ND = not detected

NE = not established

NM = not measured

µg/L = micrograms per liter

TABLE 5

Summary of Groundwater Analytical Data for March 2014 Carbon Change Out Samples – South Base Boundary Groundwater Treatment Plant

Constituent	Instantaneous Maximum ^a (µg/L)	Detection Limit (µg/L)	N/C	25 March 2014 (µg/L)		
				Influent	Midpoint	Effluent
Halogenated Volatile Organics						
Carbon Tetrachloride	0.5	0.14	0	ND	ND	ND
Chloroform	5.0	0.16	0	0.25 J	ND	ND
1,1-Dichloroethane	5.0	0.50	0	ND	ND	ND
1,2-Dichloroethane	0.5	0.15	0	0.52	ND	ND
1,1-Dichloroethene	5.0	0.19	0	ND	ND	ND
cis-1,2-Dichloroethene	5.0	0.19	0	1.1	ND	0.22 J
trans-1,2-Dichloroethene	5.0	0.33	0	ND	ND	ND
Methylene Chloride	5.0	0.66	0	ND	ND	ND
Tetrachloroethene	5.0	0.21	0	ND	ND	ND
1,1,1-Trichloroethane	5.0	0.14	0	ND	ND	ND
1,1,2-Trichloroethane	5.0	0.20	0	ND	ND	ND
Trichloroethene	5.0	0.19	0	21	ND	0.26 J
Vinyl Chloride	0.5	0.18	0	ND	ND	ND
Non-Halogenated Volatile Organics						
Benzene	1.0	0.17	0	ND	ND	ND
Ethylbenzene	5.0	0.22	0	ND	ND	ND
Toluene	5.0	0.14	0	ND	ND	ND
Xylenes	5.0	0.23 – 0.5	0	ND	ND	ND
Other						
Total Petroleum Hydrocarbons – Gasoline	50	8.5	0	NM	NM	ND
Total Petroleum Hydrocarbons – Diesel	50	50	0	NM	NM	ND
Total Suspended Solids (mg/L)	NE	1.0	0	13 J	NM	NM

^a 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

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

ND = not detected

NE = not established

NM = not measured

µg/L = micrograms per liter

Figure 1
SBBGWTP Total VOC Influent Concentrations and Average Flowrate
Twelve Month History
Travis Air Force Base, California

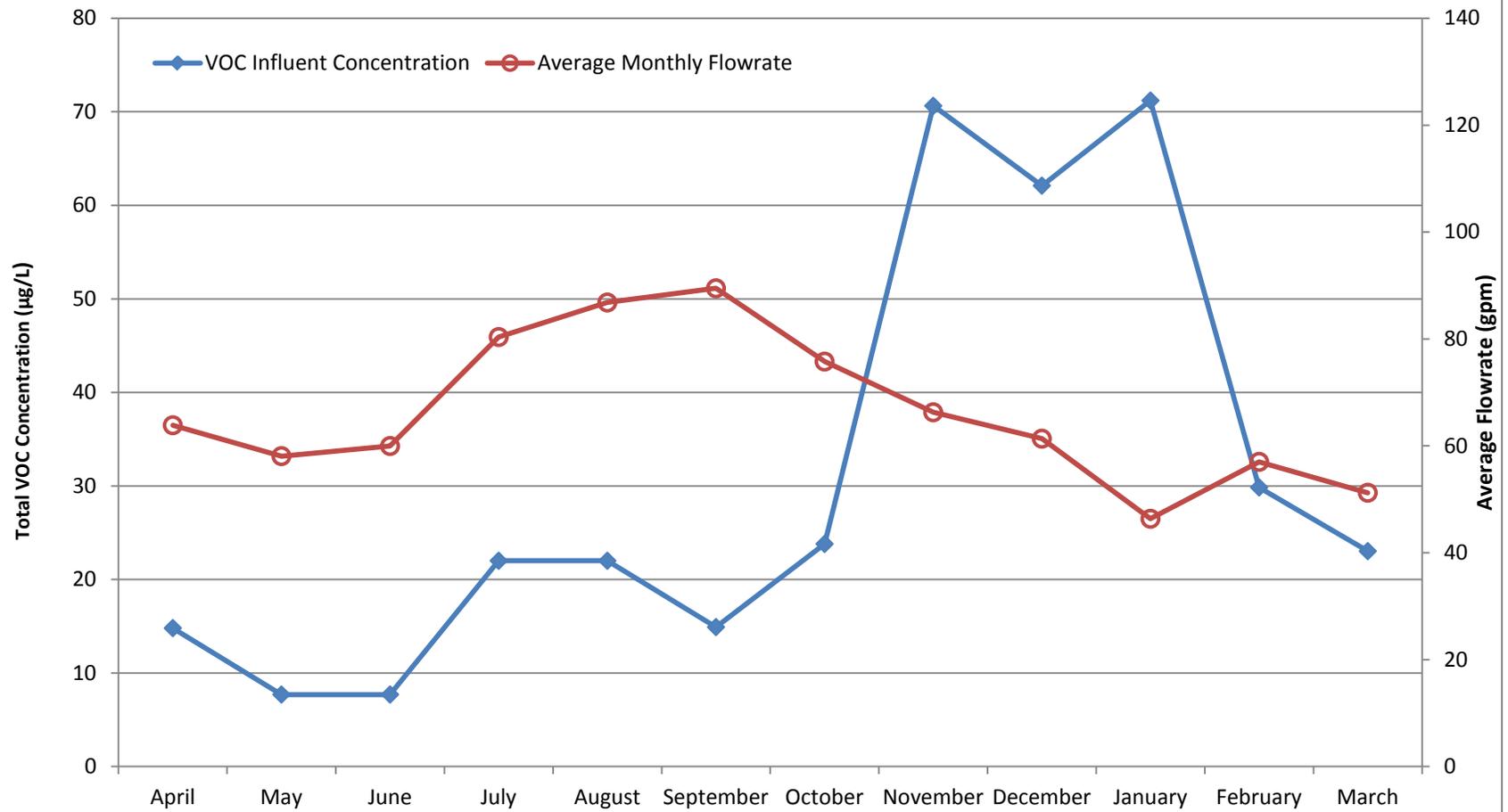
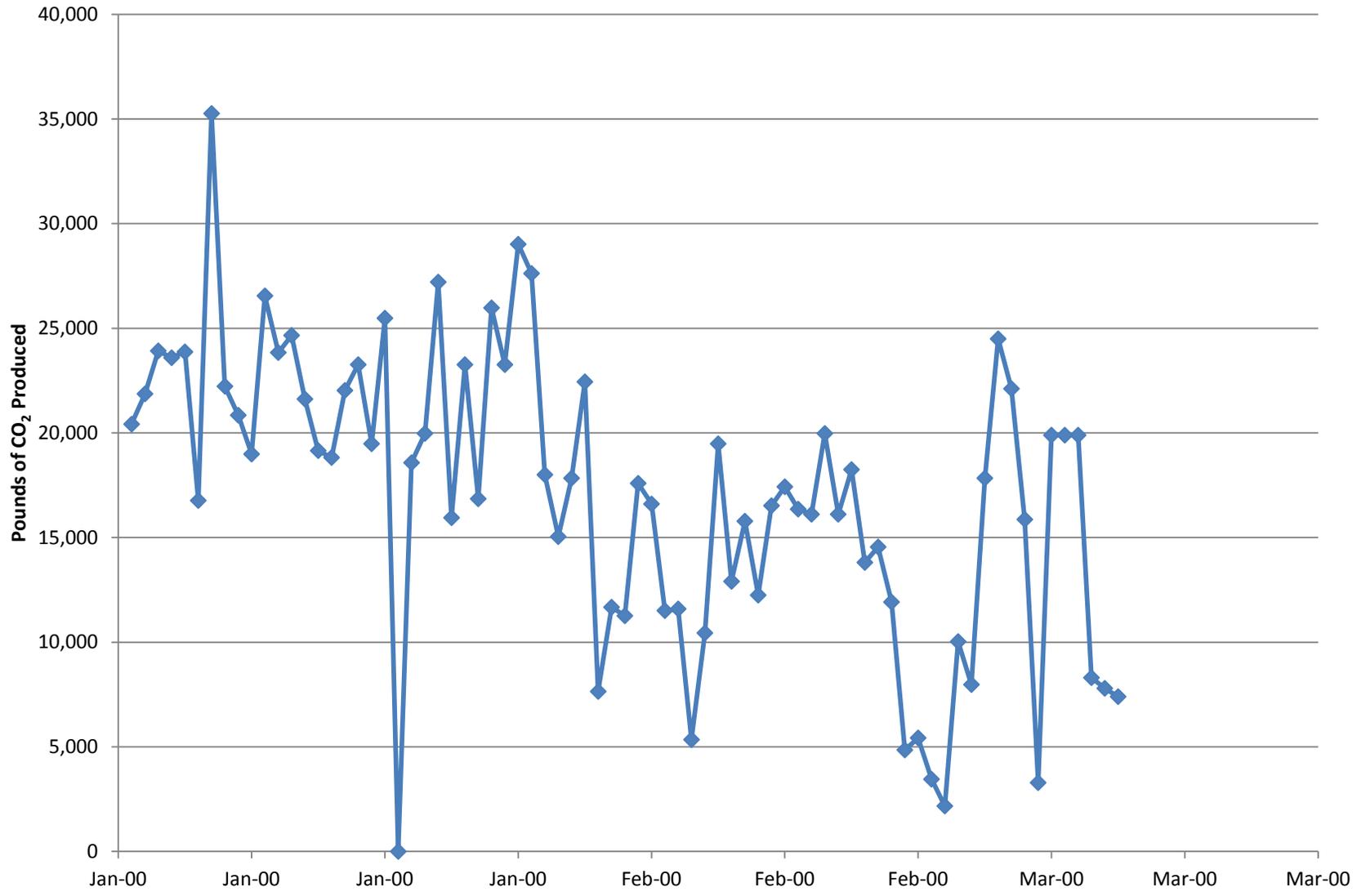


Figure 2

Equivalent Pounds of CO₂ Produced by the South Base Boundary Groundwater Treatment Plant



Central Groundwater Treatment Plant Monthly Data Sheet

Report Number: 176

Reporting Period: 27 February 2014 – 31 March 2014

Date Submitted: 10 April 2014

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, two (2) bioreactor treatability studies, and various rebound studies.

System Metrics

Table 1 presents operational data from the March 2014 reporting period.

Table 1 – Operations Summary – March 2014			
Initial Data Collection:	2/27/2014 12:00	Final Data Collection:	3/31/2014 13:00
Operating Time:		Percent Uptime:	Electrical Power Usage:
CGWTP:	769 hours	CGWTP:	100%
WTTP:	Water: 0 hours Vapor: 0 hours	WTTP:	Water: 0% Vapor: 0%
CGWTP:		CGWTP:	2,771 kWh (3,796 lbs CO ₂ generated ^a)
WTTP:		WTTP:	0 kWh
Gallons Treated: 1.58 million gallons		Gallons Treated Since January 1996: 493 million gallons	
VOC Mass Removed:		VOC Mass Removed Since January 1996:	
5.28 lbs^b (groundwater only)		2,678 lbs from groundwater	
0 lbs (vapor only)		8,686 lbs from vapor	
Rolling 12-Month Cost per Pound of Mass Removed: \$2,305 ^c			
Monthly Cost per Pound of Mass Removed: \$1,064			
^a Based on Department of Energy estimate that 1 kilowatt hour generated produces 1.37 pounds of GHG. ^b Calculated using March 2014 EPA Method SW8260B analytical results. ^c Costs include operations and maintenance, reporting, analytical laboratory, project management, and utility costs related to operation of the CGWTP and are reported based on the calendar month.			

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

Table 2 – CGWTP Average Flow Rates ^a		
Location	Average Flow Rate	
	Groundwater (gpm)	Soil Vapor (scfm) ^b
EW01x16	20.3	Offline
EW02x16	7.0	Offline
EW03x16	0.1 ^c	Offline
EW605x16	7.0	Offline
EW610x16	3.8	Offline
CGWTP	34.2	--
WTTP	-- ^b	Offline

^a Flow rates calculated by dividing total gallons processed by system operating time for the month.
^b No soil vapor was treated in March 2014.
^c Water discharged to Site SS016 bioreactor – flow rate taken from wellhead Flow Totalizer divided by operating time during the month.
gpm = gallons per minute
-- = not applicable/not available
scfm = standard cubic feet per minute

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

Table 3 – Summary of System Shutdowns					
Location	Shutdown		Restart		Cause
	Date	Time	Date	Time	
CGWTP (Groundwater)					
	None	NA			
WTTP					
	None	NA			

CGWTP = Central Groundwater Treatment Plant
WTTP = West Transfer Treatment Plant

Summary of O&M Activities

Monthly groundwater samples were collected at the CGWTP on 4 March 2014. Sample results are presented in Table 4. The total VOC concentration (402.24 µg/L) in the influent sample has decreased since the February 2014 sample (414.40 µg/L) was collected. Together with the February results, the influent total VOC concentrations in March remained at about the highest level over the past 12 months. Together with the increasing trend in influent flow rates over the past two months, this treatment plant is maintaining a high level of contaminant mass removal. This recent trend likely reflects seasonal variation, and the increase in groundwater recharge from rainfall.

Concentrations of 1,2-Dichlorobenzene (DCB) (0.34 µg/L), 1,3-DCB (0.52 µg/L), 1,4-DCB (0.63 µg/L), chlorobenzene (0.25 µg/L), 1,1-DCE (0.97 µg/L), cis-1,2-DCE (79.6 µg/L), tetrachloroethene (0.71 µg/L), trans-1,2-Dichloroethene (4.9 µg/L), TCE (314 µg/L), and vinyl chloride (0.32 µg/L) were detected at the influent sampling location. Vinyl chloride was also detected at the midpoint sampling locations after Carbon 1 (0.73 µg/L) and Carbon 2 (0.2 µg/L).

No contaminants were detected at the effluent sampling location. Travis Air Force Base will continue to monitor contaminant concentrations at the CGWTP for breakthrough in the primary vessel.

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 average flow rate through the treatment plant in March 2014 increased from the flow rate measured in February 2014.

The Site DP039 bioreactor continues to operate in a “pulsed mode” in order to improve the rate of remediation and to preserve the amount of total organic carbon being produced within the bioreactor. The “pulsed mode” operation continued on a two (2) week transition schedule in March 2014.

Optimization Activities

No optimization activities occurred at CGWTP in March 2014.

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 3,796 pounds of GHG during March 2014. This is an increase from the amount produced in February 2014 (approximately 3,158 pounds) and is the result of a longer reporting period and greater gallons treated in March than in the previous month.

TABLE 4
Summary of Groundwater Analytical Data for March 2014 – Central Groundwater Treatment Plant

Constituent	Instantaneous Maximum* (µg/L)	Detection Limit (µg/L)	N/C	4 March 2014 (µg/L)			
				Influent	After Carbon 1 Effluent	After Carbon 2 Effluent	System Effluent
Halogenated Volatile Organics							
Carbon Tetrachloride	0.5	0.14	0	ND	ND	ND	ND
Chloroform	5.0	0.16	0	ND	ND	ND	ND
cis-1,2-Dichloroethene	5.0	0.19	0	79.6	ND	ND	ND
1,1-Dichloroethane	5.0	0.5	0	ND	ND	ND	ND
1,2-Dichloroethane	0.5	0.15	0	ND	ND	ND	ND
1,1-Dichloroethene	5.0	0.19	0	0.97	ND	ND	ND
Methylene Chloride	5.0	0.66	0	ND	ND	ND	ND
MTBE	1.0	0.5	0	ND	ND	ND	ND
Tetrachloroethene	5.0	0.21	0	0.71	ND	ND	ND
1,1,1-Trichloroethane	5.0	0.14	0	ND	ND	ND	ND
1,1,2-Trichloroethane	5.0	0.2	0	ND	ND	ND	ND
Trichloroethene	5.0	0.19	0	314	ND	ND	ND
trans-1,2-Dichloroethene	5.0	0.33	0	4.9	ND	ND	ND
Vinyl Chloride	0.5	0.18	0	0.32 J	0.73	0.2 J	ND
Non-Halogenated Volatile Organics							
Benzene	1.0	0.17	0	ND	ND	ND	ND
Ethylbenzene	5.0	0.22	0	ND	ND	ND	ND
Toluene	5.0	0.14	0	ND	ND	ND	ND
Total Xylenes	5.0	0.23 – 0.5	0	ND	ND	ND	ND
Other							
Total Dissolved Solids (mg/L)	NA	10	0	NM	NM	908	NM

* 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

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

ND = not detected

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 Start Date	Pulse Off Start Date
MW750x39	12 April 2013	26 April 2013*
	10 May 2013	24 May 2013
	7 June 2013	21 June 2013
	15 July 2013	26 July 2013
	8 August 2013	16 August 2013
	30 August 2013	13 September 2013
	27 September 2013	11 October 2013
	25 October 2013	8 November 2013
	22 November 2013	5 December 2013
	20 December 2013	3 January 2014
	17 January 2014	31 January 2014
	18 February 2014	28 February 2014
	14 March 2014	28 March 2014

* Damage to the above ground discharge pipe feeding the bioreactor was observed at shutdown. The piping was repaired prior to the 10 May 2013 restart.
 CGWTP = Central Groundwater Treatment Plant
 EW = Extraction Well

Figure 1
CGWTP Total VOC Influent Concentrations and Average Flowrate
Twelve Month History
Travis Air Force Base, California

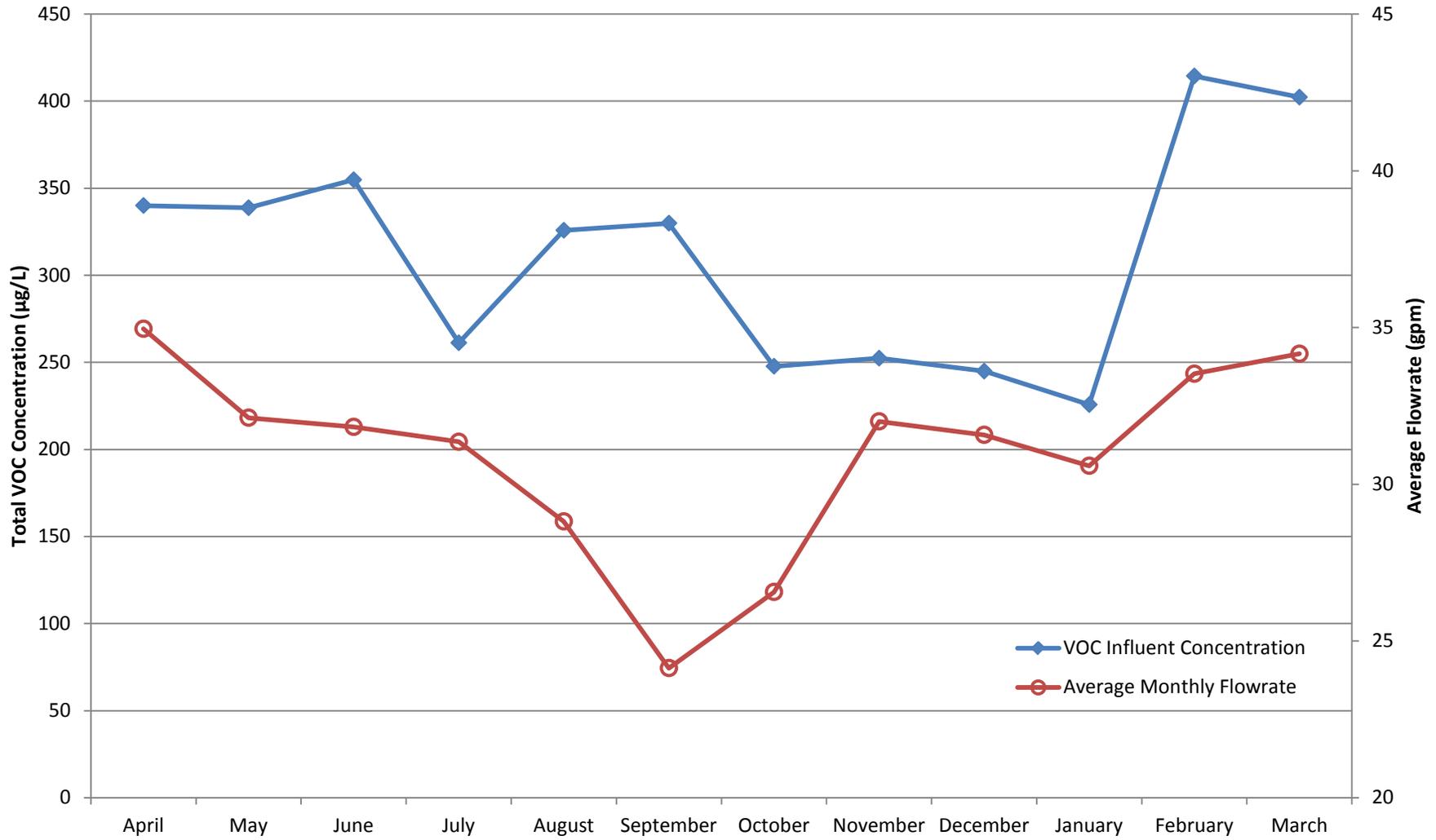
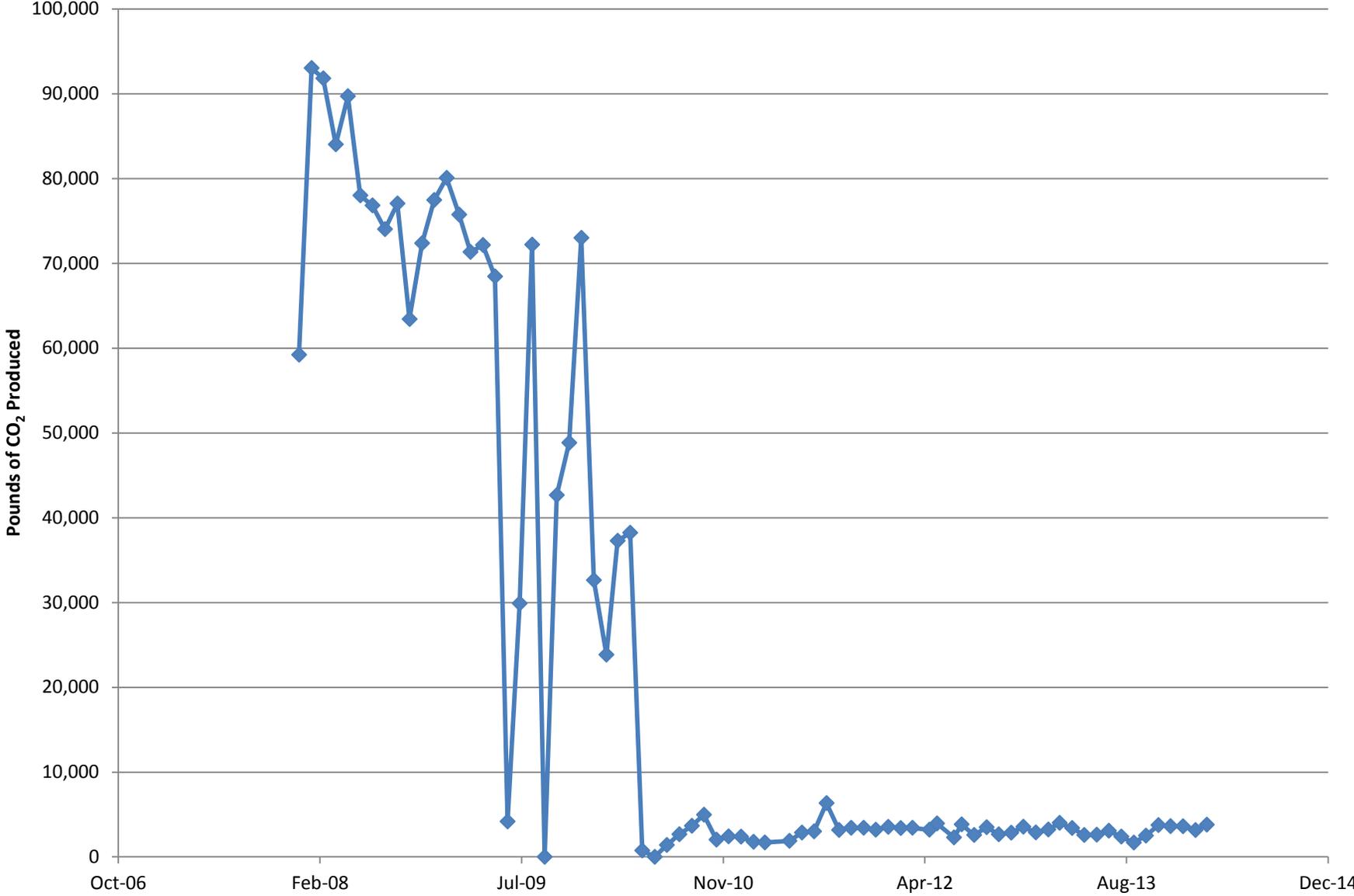


Figure 2
Equivalent Pounds of CO₂ Produced by the Central Groundwater Treatment Plant



Site ST018 Groundwater Treatment Plant Monthly Data Sheet

Report Number: 037 Reporting Period: 27 February 2014 – 31 March 2014 Date Submitted: 10 April 2014

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

System Metrics

Table 1 presents operation data from the March 2014 reporting period.

Table 1 – Operations Summary – March 2014			
Initial Data Collection:	2/27/2014 15:45	Final Data Collection:	3/31/2014 11:00
Operating Time:	Percent Uptime:	Electrical Power Usage:	
ST018GWTP: 762 hours	ST018GWTP: 100%	ST018GWTP: 157 kWh (215 lbs CO₂ generated^a)	
Gallons Treated: 211.2 thousand gallons		Gallons Treated Since March 2011: 5.50 million gallons	
Volume Discharged to Union Creek: 211.2 thousand gallons			
BTEX, MTBE, TPH Mass Removed: 0.04 lbs^b		BTEX, MTBE, TPH Mass Removed Since March 2011: 26.0 lbs	
MTBE (Only) Removed: 0.02 lbs^b		MTBE (Only) Mass Removed Since March 2011: 6.0 lbs	
Rolling 12-Month Cost per Total Pounds of Mass Removed: \$33,390 ^c			
Monthly Cost per Pound of Mass Removed: \$131,752 ^d			
^a Based on Department of Energy estimate that 1 kilowatt hour generated produces 1.37 pounds of GHG. ^b Calculated using March 2014 EPA Method SW8260B analytical results. ^c Costs include operations and maintenance, reporting, analytical laboratory, project management, and utility costs related to operation of the system. ^d Inflated due to a decreased influent concentration in the denominator when determining the cost per pound of mass. 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		
Location	Average Flow Rate Groundwater (gpm) ^a	Hours of Operation
EW2014x18	1.70	762
EW2016x18	1.51	762
EW2019x18	1.53	762
Site ST018 GWTP	5.40	762

^a Flow rates calculated by dividing total gallons processed by the hours of operation, from the totalizer and hour meter at each location.
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		Restart		Cause
	Date	Time	Date	Time	
ST018GWTP	None				

ST018GWTP = Site ST018 Groundwater Treatment Plant

Summary of O&M Activities

Groundwater samples were collected at the ST018GWTP on 4 March 2014. Sample results from the March sampling event are presented in Table 4. The total influent concentration (benzene, toluene, ethylbenzene, total xylenes, MTBE, TPH-gas, TPH-diesel, and TPH-motor oil) in the March 2014 influent sample was 20.1 µg/L, which is a decrease from the previous (February 2014) influent concentration of 24.2 µg/L. The influent concentration for MTBE during March 2014 was 13.5 µg/L. This is also a decrease from the February 2014 influent concentration for MTBE of 20.2 µg/L.

Figure 1 presents plots of flow rate and influent total VOC (TPHg, TPHd, MTBE, and BTEX) and MTBE concentrations at the ST018GWTP versus time. No contaminants were detected at the midpoint and effluent sampling locations in March 2014. As shown on Figure 1, the average flow rate through the ST018GWTP has increased from the January and February 2014 average flow rates. No downtime occurred at any of the extraction wells during March.

Optimization Activities

No optimization activities were performed in March 2014.

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.

The ST018GWTP produced approximately 215 pounds of GHG during March 2014. This is an increase from February 2014 (153 pounds) and is likely due to a greater volume of groundwater having been treated and a longer reporting period for March 2014 than in the previous month. Figure 2 presents the historical GHG production from the ST018GWTP. The overall GHG generation remains considerably lower than traditional GWTPs since the system is predominantly powered by solar arrays.

TABLE 4
 Summary of Groundwater Analytical Data for March 2014 – Site ST018 Groundwater Treatment Plant

Constituent	Instantaneous Maximum ^a (µg/L)	Detection Limit (µg/L)	N/C	4 March 2014 (µg/L)			
				Influent	After Carbon 1	After Carbon 2	System Effluent
Fuel Related Constituents							
MTBE	5	0.5	0	13.5	NM	ND	ND
Benzene	5	0.17	0	1.4	NM	ND	ND
Ethylbenzene	5	0.22	0	1.9	NM	ND	ND
Toluene	5	0.14	0	ND	NM	ND	ND
Total Xylenes	5	0.23 – 0.5	0	3.32	NM	ND	ND
Total Petroleum Hydrocarbons – Gasoline	50	8.5	0	ND	ND	NM	ND
Total Petroleum Hydrocarbons – Diesel	50	50	0	ND	ND	NM	ND
Total Petroleum Hydrocarbons – Motor Oil	--	160	--	ND	ND	NM	ND

^a In accordance with the National Pollutant Discharge Elimination System (NPDES) Effluent Limitations

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

ND = not detected above method detection limit

NM = not measured this month

Figure 1
S18GWTP Total VOC and MTBE Influent Concentrations
(Benzene, Toluene, Ethylbenzene, Xylenes, MTBE, TPH)
Travis Air Force Base, California

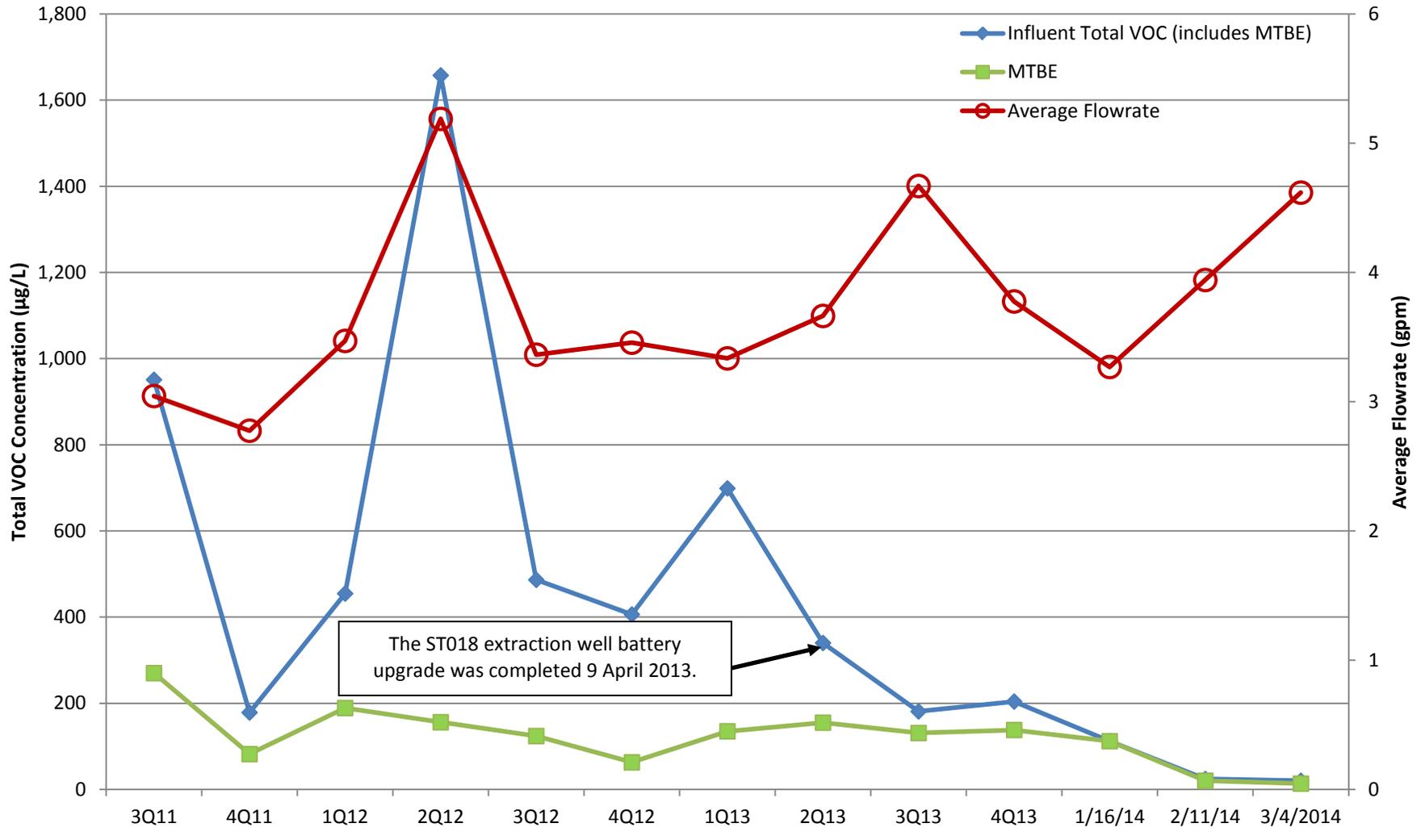
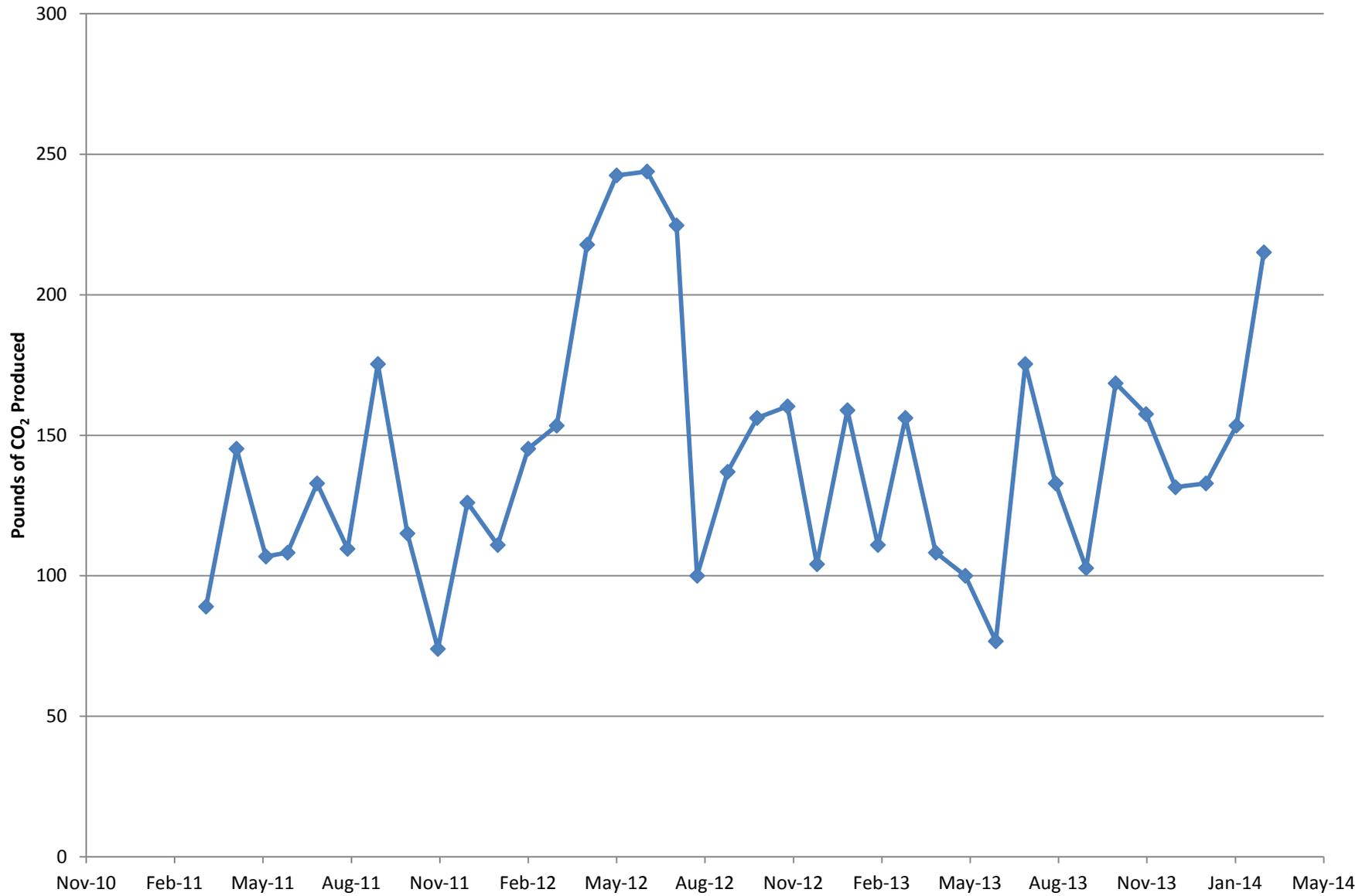


Figure 2
Equivalent Pounds of CO₂ Produced by the Site ST018 Groundwater Treatment Plant



Demonstration Projects

Travis AFB

RPM Meeting

April 16, 2014

Previous Demonstration Sites

Site

- SS015
- SS016
- SD036
- SD037
- DP039

Technology

- EVO Injection
- In situ bioreactor
- EVO Injection
- EVO Injection
- EVO Biobarrier and in situ bioreactor

Planned Demonstration Sites

Sites/Technology

- FT004: Treatment demonstration for EVO recirculation
- SS014: Technology demonstration for Sulfate reduction - anaerobic biodegradation
- SD031: Treatment demonstration for EVO recirculation

Unique Site Features

- Poor distribution (tight formation), no previous injections, multiple wetlands
- TPH/BTEX contaminants, excavate above plume and place sulfate materials at or near water table
- Poor distribution, No previous injections, 1,1-DCE is primary contaminant, wetlands

Need for New Demonstration Sites

- EVO recirculation: Demonstration of treatment via EVO recirculation needs “virgin” sites where previous injections have not taken place. This demonstration is also designed to address sites where subsurface distribution is difficult due to high clay content
- Sulfate reduction/biodegradation: Demonstration of anaerobic sulfate reduction requires a POCO site where the target zone can be excavated

Travis AFB Restoration Program

Program Overview

RPM Meeting
April 16, 2014

Completed Documents

- 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***

Completed Field Work

- 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

Documents & Field Work In-Progress

Documents

- Groundwater Record of Decision (ROD)
- Kinder Morgan LF044 Land Use Control Report
- ***CG508 POCO Work Plan***

Field Work

- Biological Resource Assessment
- ***2014 Annual GRIP Sampling Event***

Documents Planned

- 2013 Annual GRISR Apr
- **ESD to WABOU Soil ROD** May
- **ESD to NEWIOU Soil, Sediment, & Surface Water ROD** May
- **SD031 Treatment Demonstration Work Plan** May
- Travis AFB UFP-QAPP Jun
- **FT004 Treatment Demonstration Work Plan** Jun
- **SS014 Technology Demonstration Work Plan** Jun
- **DP039 Lead Excavation Technical Memo** Jun
- **TA500 Investigation Work Plan** Jun
- **SS015 GW RD/RA Work Plan** TBD
- **SS016 GW RD/RA Work Plan** TBD
- **SD036 RD/RA Work Plan** TBD
- **SD037 GW RD/RA Work Plan** TBD

ESD = Explanation of Significant
Differences

Field Work Planned

- Old Skeet Range Characterization Sampling

TBD

Note: Travis will try to notify regulatory agencies via email approximately one week in advance of planned field work

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 Memorandum 8

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