

**Travis Air Force Base
Environmental Restoration Program
Restoration Program Manager's
Meeting Minutes
20 October, 1400 Hours**

Mr. Lonnie Duke of the Air Force Civil Engineer Center (AFCEC) Restoration Installation Support Team (IST) conducted the Restoration Program Manager's (RPM) meeting on 20 October 2016 at 1400 hours in Building 248 at Travis AFB, California. Attendees included:

Lonnie Duke	AFCEC/CZOW
Glenn Anderson	AFCEC/CZOW
Angel Santiago Jr.	AFCEC/CZOW
William Hall	AFCEC/CZR
Merrie Schilter-Lowe	Travis AFB 60 AMW/PA
Monika O'Sullivan	AFCEC/CZOW
Adriana Constantinescu	California Regional Water Quality Control Board (RWQCB)
Ben Fries	DTSC
Nadia Hollan Burke	USEPA
Indira Balkissoon	Techlaw, Inc.
Karen Wagner	AFCEC/CZOW
Tony Chakurian	CH2M
Levi Pratt	CH2M
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 (September 2016)
Attachment 4	CGWTP Monthly Data Sheet (September 2016)
Attachment 5	LF007C Monthly Data Sheet (September 2016)
Attachment 6	ST018 Monthly Data Sheet (September 2016)
Attachment 7	Site SD031 Soil Remedial Investigation Triad Update
Attachment 8	Site ST027B Technology Demonstration Baseline Sampling Results
Attachment 9	Site DP039 Remedial Action Construction Completion Report Presentation
Attachment 10	Presentation: Program Update

1. ADMINISTRATIVE

A. Previous Meeting Minutes

The 21 September 2016 RPM meeting minutes were approved and finalized as written.

B. Action Item Review.

Action items from September 2016 were reviewed.

Action item 1 is ongoing: Ms. O'Sullivan to provide updates on perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA) as she becomes aware of them. 20 October 2016: No updates.

Action item 2 is ongoing: Mr. Duke to provide a copy of the Biological Assessment/Biological Opinion (BA/BO) and fieldwork extension letter to the regulators by 16 November 2016.

Action item 3 is closed: Mr. Duke to look into the possibility of adding a table in future Groundwater Remediation Implementation Status Reports (GRISRs) of agreed upon comments that Travis AFB said will be addressed in the GRISR. Mr. Duke agreed to add this table to future GRISRs.

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

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

Travis AFB Annual Meeting and Teleconference Schedule

The next RPM meeting will be a teleconference meeting, which will be held on Wednesday, 16 November 2016, at 0930 hours.

Mr. Duke requested that Jeannette Cumberland reserve the Northern Solano County Association of Realtors office for the RAB Meeting scheduled for April 2017.

Travis AFB Master Document Schedule

- Community Involvement Plan (CIP): Regulatory comments on the draft CIP are due 28 October 2016. Ms. Burke indicated EPA may need additional time (two [2] weeks) to review and to provide comments. Mr. Anderson agreed and asked for Ms. Burke to send an email requesting an extension and the additional time needed.

- Action Memorandum Non-Time Critical Removal Action at Site TS060 (Old Skeet Range): The draft final due date was changed to 13 October 2016. The final date was changed accordingly.
- Potrero Hills Annex (FS, PP, and ROD): No change to the schedule. Mr. Anderson said that Yemia Hashimoto/RWQCB is still working on issuing a draft order and will issue a revised site cleanup requirements (SCR) order based on the findings from the 2015 investigation report. Ms. Hashimoto has emailed him requesting historical information. Adriana Constantinescu/RWQCB said that the historical information is relevant, because the Water Board wants to use this document as guidance for regulatory actions. Ms. Constantinescu said the SCR Order is in review with management and should be ready for finalizing in a couple of weeks.
- Site SD034 Technology Demonstration Work Plan: Document went final and was moved to history.
- Site TS060 Removal Action Work Plan: Response to Comments due and Final Due dates were changed to 20 December 2016 because of delayed fieldwork.
- Multi-Site Bioaugmentation Technology Demonstration Work Plan: This document went final and will be moved to history.
- Site SS016 Soil Data Gap Investigation Work Plan: This document went final and will be moved to history.
- Site LF044 Investigation Work Plan: Response to Comments due and final due dates for this document were changed to 22 February 2017 because of delayed fieldwork.
- Site FT004 POCO Soil Data Gap Investigation Work Plan: Response to Comments due and the final due dates for this document were changed to 19 January 2017 because of delayed fieldwork.
- Sites POCO ST028 and ST032 Well Decommissioning Work Plan: Response to Comments due and the final due dates were changed to 21 October 2016.
- Quarterly Newsletter (October 2016): Dates were revised to reflect the actual dates the newsletter went out.
- 2015 Annual GRISR: No change was made to the schedule. EPA has reviewed the Response to Comments and will request additional information on one of the previous comments.
- Site FT005 Technology Demonstration Construction Completion Report: The Response to Comments Meeting was changed to 20 October 2016, the rest of the dates were changed accordingly. EPA is reviewing Response to Comments. Ms. Constantinescu said that Water Board did not have any comments.
- Site DP039 Remedial Action Construction Completion Report: Draft to Agencies date was changed to 30 September 2016, the rest of the dates were changed accordingly.

- Site CG508 POCO Well Decommissioning and Site Closeout Technical Memorandum: Draft to Agencies was changed to 5 October 2016, the rest of the dates were changed accordingly.
- Sites OW051, OW053, and OW054 POCO Evaluation/Closeout Report: Dates changed from TBD to actual planned dates.

Ms. Burke asked, how do we stay updated on the technology demonstration projects? She suggested a report at the RPM meetings. Mr. Duke said he would add a status progress report of the technology demonstrations, as a running presentation for future RPM meetings.

2. CURRENT PROJECTS

Treatment Plant Operation and Maintenance Update

South Base Boundary Groundwater Treatment Plant, September 2016 (see Attachment 3)

The South Base Boundary Groundwater Treatment Plant (SBBGWTP) performed at 50.5% uptime, and 2.2 million gallons of groundwater were extracted and treated during the month of September 2016. All of the treated water was discharged to Union Creek. The average flow rate for the SBBGWTP was 101.5 gallons per minute (gpm). Electrical power usage was 8,230 kWh, and approximately 6,090 pounds of CO₂ were created (based on DOE calculation). Approximately 0.5 pounds of volatile organic compounds (VOCs) were removed in September. The total mass of VOCs removed since startup of the system is 481.8 pounds.

Optimization Activities for SBBGWTP: No optimization activities are reported for the month of September 2016.

Mr. Duke said that the treatment plant remains shut down awaiting a carbon change out to be scheduled. Ms. Burke requested that Travis AFB notify them when the treatment plant is back online.

Central Groundwater Treatment Plant, September 2016 (see Attachment 4)

The Central Groundwater Treatment Plant (CGWTP) performed at 100% uptime with approximately 1,523,700 gallons of groundwater extracted and treated during the month of September 2016. All treated water was discharged to the storm drain. The average flow rate for the CGWTP was 35.4 gpm. Electrical power usage was 2,481 kWh for all equipment connected to the Central Plant, and approximately 2,724 pounds of CO₂ were generated. Approximately 3.18 pounds of VOCs were removed from groundwater by the treatment plant in September. The total mass of VOCs removed since the startup of the system is 11,444 pounds.

Optimization Activities for CGWTP: No optimization activities are reported for the month of September 2016. 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, September 2016 (see Attachment 5)

Subarea LF007C Treatment Plant (LF007CGWTP) performed at 100% uptime with approximately 149,390 gallons of groundwater extracted and treated during the month of September 2016. The average flow rate at the LF007C was 3.45 gpm, and electrical power use was 0 kWh for all the equipment connected to the LF007C plant; and 0 pounds of CO₂ was generated; this system is 100 percent off the power grid. Approximately 1.57×10^{-3} pounds of VOCs were removed from the groundwater in September. The total mass of VOCs removed since the startup of the system is 174.36 pounds.

Optimization Activities for LF007CGWTP: No optimization activities are reported for the month of September 2016.

ST018 Groundwater (MTBE) Treatment Plant, September 2016 (see Attachment 6)

Site ST018 (MTBE) Treatment Plant (ST018 GWTP) performed at 100% uptime with approximately 206,815 gallons of groundwater extracted and treated during the month of September 2016. All treated water was discharged to the sanitary sewer. The average flow rate for the ST018 GWTP was 4.8 gpm. Electrical power usage for the month was 121 kWh for all equipment connected to the ST018 GWTP. The total CO₂ equivalent, including an estimate for the carbon change out, equates to approximately 490 pounds. Approximately 0.31 pound of BTEX, MTBE and TPH was removed in September 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 39.3 pounds, and the total MTBE mass removed since startup of the system is 9.6 pounds.

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

Optimization Activities for ST018GWTP: No optimization activities to report for the month of September 2016.

Presentations:

Presentation: Site SD031 Soil Remedial Investigation Triad Update (see Attachment 7)

Mr. Chakurian presented the Site SD031 Soil Remedial Investigation Triad Update. For details see

attachment 7, which includes maps and figures.

Mr. Chakurian, reported the status of the Site SD031 soil investigation starting with the detection of visible soil staining, while installing the groundwater technology demonstration. After funding was secured to conduct a soil remedial investigation and feasibility study, the first round of sampling was not able to delineate the boundaries of the soil plume.

Stepped-out sampling with 18 hand auger borings found the limits of contamination in 4 borings at SB2705x31, SB2716x31, SB2717x31, and SB2719x31. Some borings with stained soil did not have contamination above the screening levels.

Ten direct push soil borings were drilled along the presumed extent of the soil plume. Four of the soil borings were not visibly stained at SB2726x31, SB2727x31, SB2729x31, and SB2730x31. Two of the soil borings (SB2744x50 and SB2745x50) were stained, but at depths deeper than adjacent Site SD031 boring (SB2728x31) and are likely associated with impacts from Site OW050.

Hexavalent chromium has been observed in most of the soil samples throughout Site SD031 at concentrations above the screening levels (0.30 mg/kg) with the maximum concentration of 1.5 mg/kg. Inorganic Reference Concentrations for hexavalent chromium have not been established at Travis AFB by the previous background study. We will be conducting a background study to establish Inorganic Reference Concentrations for hexavalent chromium in shallow and deep soil.

Groundwater samples were collected from existing monitoring wells MW571x31 and MW1741x31. We are awaiting the analytical results of the groundwater sampling. Mr. Wray stated we wanted to see if any of the soil contamination is migrating to the groundwater. He said these wells were picked independent from the groundwater plume, and we chose them based on the contaminants found in the soil.

Mr. Wray asked EPA about getting approval of a background study. Ms. Burke and Ms. Balkissoon stated they will look into it and get back to us with the best way to get approval.

Presentation: Site ST027B Technology Demonstration (see Attachment 8)

Mr. Chakurian presented the Site ST027B Technology Demonstration. For details see attachment 8, which includes maps and figures.

Mr. Chakurian reported fieldwork conducted and analytical results at Site ST027B.

Fieldwork:

Monitoring and injection wells were drilled, installed, and developed from September 13th through 21st. During drilling, shallow bedrock was encountered between 10 and 18.5 ft bgs. Borings were initially dry when drilled, with the exception MW2258x27. Groundwater was encountered in MW2258x27 at 13 ft bgs. Crystalline gypsum was encountered as disseminations or fracture filling in most of the borings starting from between 7 and 10 ft

bgs. Up to 50% of disseminated gypsum was present in IW2255x27 at 10 ft bgs. No gypsum was found in MW2258x27.

The injection wells were all screened from 13 to 33 ft bgs. Because we were not sure exactly where the water was going to be entering the wells, we increased the length of the filter pack to encompass the area where the gypsum was found, since that was a historical source of water at some point in the past. So we raised the top of the filter pack, even though the screens were installed from 13 to 33 feet bgs, to 9 or 10 feet bgs. Monitoring well MW2257x27, which is in the injection well area, was screened from 9 to 19 ft bgs. Monitoring well MW2258x27, which is the down gradient well, was screened from 13 to 23 ft bgs.

Baseline Analytical Results:

Maximum TCE concentration was 1,200 µg/L and was observed in injection well IW2253x27. Concentrations of TCE vary greatly in adjacent injection wells, likely due to the contamination being present in the bedrock and to being fracture controlled [IW2253x27 (1,200 µg/L) vs. IW2254x27 (7.9 µg/L)]. The TCE concentration in monitoring well MW791x27 has decreased from 498 µg/L in 2012 to 230 µg/L in 2016.

Daughter products of TCE (primarily cis-1,2-DCE, with some vinyl chloride) are present in several of the wells at Site ST027B. The number of Dehalococcoides present in MW791x27 and MW2257x27 are 2.60E+00 and 8.80E+00 cells/mL, respectively. The number of Dehalobacter spp. present for these same wells are 8.60E+02 and 1.75E+02 cells/mL, respectively.

Presentation: Site DP039 Remedial Action Construction Completion Report (see Attachment 9)

Mr. Pratt presented the Site DP039 Remedial Action Construction Completion Report. For details see attachment 9, which includes maps and figures.

Mr. Pratt covered the following topics in the presentation: the site background, remedial action history, remedial action approach, remedial action implementation [optimization of phytoremediation system, bioreactor optimization, emulsified vegetable oil (EVO) permeable reactive barrier (PRB) Optimization, and enhanced attenuation (EA)], baseline sampling, plume refinement, EVO injections, performance monitoring and evaluation of performance monitoring data, and reporting.

Background:

Site DP039 primarily consists of former Building 755, which had been the Travis AFB Battery and Electric Shop. In 1968, Building 755 was originally used to test rocket engines, but only petroleum-based liquid fuel was used at the site as part of this testing.

Before 1978, battery acid solutions and chlorinated solvents were poured into a sink within Building 755 and conveyed by a pipeline less than 100 feet to a rock-filled acid

neutralization sump. This practice was discontinued in 1978, when the pipeline was dismantled and reconnected to the sanitary sewer line.

In July 1993, the sump was excavated and disposed of off-base. Building 755 was demolished in 2009, and the lot is currently vacant.

Remedial Action History:

- A GET system, which consisted of two dual phase extraction wells, was installed in the Building 755 source area and was operated from 2000 to 2008.
- A phytoremediation study was initiated in August 1998 to assess the effectiveness of planted trees to hydraulically control and remove VOC contamination from groundwater.
- In November 2008, the GET system at Site DP039 was shut down for the installation of AFCEE demonstration project: an in situ bioreactor in the location of the former sump near Building 755.
- A technology demonstration of enhanced reductive dechlorination (ERD) treatment using an EVO PRB was initiated in 2010.
- The Travis AFB Groundwater ROD selected bioreactor, phytoremediation, EVO PRB, and EA as the final remedy for Site DP039.

Remedial Action Approach:

The Remedial Action (RA) approach at Site DP039 is to optimize the existing phytoremediation and bioreactor components, and to supplement the existing EVO PRB in order to promote ERD throughout the portion of the Site DP039 groundwater plume where TCE concentrations exceed 500 µg/L. The RA approach for Site DP039 also included expansion of the EA monitoring network in the distal portion of the plume to support the design of an EA monitoring network. To implement and optimize the final remedy, 22 new injection wells, two new extraction wells, and six new monitoring wells were installed.

Remedial Action Implementation - Optimization of Phytoremediation System:

The phytoremediation system optimization included installing a gravel infiltration trench along the upgradient side of the phytoremediation system and two solar-powered extraction wells in the downgradient portions of the plume where TCE concentrations exceed 500 µg/L. The optimization also included the installation of a new conveyance line which transports the extracted groundwater from EW2382x39 and EW2383x39 to the gravel and mulch filled infiltration trench for treatment by the phytoremediation system.

An infiltration trench was installed along the upgradient western edge of the phytoremediation system. The infiltration trench was backfilled with 70/30 mixture of gravel and tree mulch to promote reductive dechlorination of VOCs and provide water and organic carbon to the root zone of the trees. Two perforated PVC infiltration pipes were

installed immediately above the gravel and mulch mixture and covered with a geotextile fabric. One piezometer was installed at the southern end of the infiltration trench for the purpose of monitoring the water level within the infiltration trench.

Two new extraction wells (EW2382x39 and EW2383x39) were installed via hollow-stem auger in portions of the plume where TCE concentrations exceed 500 µg/L. To power the new extraction well pumps, a solar panel was installed within the southwest corner of the Travis AFB gravel and rock yard.

Remedial Action Implementation – Bioreactor Optimization:

The existing bioreactor was optimized by installing one EVO injection well between the bioreactor and MW750x39, which is currently used as an extraction well to supply the bioreactor with groundwater.

Remedial Action Implementation – EVO PRB Optimization:

In addition to the existing EVO PRB, a second EVO PRB was installed between the phytoremediation area and the existing EVO PRB. The second EVO PRB consists of 21 new injection wells installed in a line perpendicular to the groundwater flow direction, similar to the existing EVO PRB. The expanded injection well network fully implements ERD treatment within the 500-µg/L TCE isocontour, consistent with the requirements of the Groundwater ROD.

Each injection well was drilled to consolidated bedrock and installed as a single-completion 2-inch polyvinyl chloride (PVC) well with 15 to 30 feet of 0.020 prefabricated slot PVC screen spanning the lowest portion of the aquifer. The injection wells comprising the new EVO PRB were drilled with a well spacing of approximately 30 feet based on an estimated radius of influence (ROI) for EVO of 15 feet for each injection well.

Remedial Action Implementation – Enhanced Attenuation:

To support the design of an EA monitoring network in the distal portion of the plume, six new monitoring wells were installed crossgradient and downgradient of the plume. Baseline concentrations of TCE detected above the cleanup level at some of the new monitoring wells indicate that the extent of the Site DP039 TCE plume is not fully defined, and additional plume definition is needed prior to the establishment of an EA network.

Baseline Groundwater Sampling:

- Bioreactor: The maximum TCE concentration of 180 µg/L was detected at downgradient well MW750x39.
- Phytoremediation System: The maximum TCE concentration detected was 1,500 µg/L at MW2042Bx39, located approximately 200 feet downgradient of the phytoremediation system. New extraction wells EW2382x39 and EW2383x39 had baseline TCE concentrations of 160 J- and 650 µg/L, respectively.

- EVO PRB: TCE was detected in all EVO PRB wells with concentrations ranging from 21 to 1,400 µg/L. The maximum TCE concentration of 1,400 µg/L was detected at new injection well IW2394x39, located near the center of the new EVO PRB.
- Enhanced Attenuation: Along the western edge of the plume, TCE concentrations detected at wells MW2376x39 (5.7 µg/L) and MW2377x39 (7 µg/L) only slightly exceeded the cleanup level. However, the TCE concentration detected at new well MW2378x39, intended to define the southwestern extent of the plume, was 170 µg/L.

Enhanced Attenuation:

Additional monitoring wells are needed to verify and monitor the full extent of the Site DP039 TCE plume.

Plume Refinement:

To support plume refinement, confirmation groundwater samples will be collected from MW2379x39 and MW543x43 and analyzed for VOCs. Four new monitoring wells will be installed, developed and post-development groundwater sample will be collected and analyzed for VOCs. Because the TCE plume appears to dive below the shallow wells screened between 10 to 20 feet, the monitoring wells will be drilled to consolidated bedrock and screened across the highest permeability zones encountered below 30 feet bgs to ensure that the TCE plume is captured. If the groundwater sampling results exceed the cleanup level for TCE, up to five additional step-out monitoring wells will be installed.

Data from these additional wells will be used to support design of an appropriate EA monitoring network, which will be documented in a technical memorandum.

EVO Injection:

Approximately 147,300 gallons of 3.7 percent EVO solution were injected into the 22 newly installed injection wells at Site DP039, followed by approximately 52,300 gallons of chase water.

Performance Monitoring:

Performance monitoring of the Site DP039 RA will be conducted semiannually for one year and annually thereafter at eight performance monitoring wells located near the new EVO injection sites and the new infiltration trench. The other 15 performance monitoring wells, two new extraction wells, two new injection wells, and two existing injection wells will be sampled annually. The results of performance monitoring will be reported in the annual GRISRs.

Evaluation of Performance Monitoring Data:

VOC data will be used to evaluate the effectiveness of the treatment. TOC analysis will provide direct data on TOC concentrations within the treatment area. Dissolved gas data particularly methane, propane, butane and acetylene will be used to assess aerobic

degradation and cometabolism in the aerobic/anaerobic groundwater transition area. Geochemical parameters will support evaluation of geochemical changes in the aquifer favorable to ERD.

Reporting:

Analytical results of the performance monitoring program and optimization opportunities for groundwater treatment at Site DP039 will continue to be presented in the annual GRISRs. The EA performance monitoring network will be presented in a technical memorandum, which will also document the confirmation groundwater sampling results and installation of the additional monitoring wells.

Ms. Burke and Ms. Balkissoon asked if the results of the new wells would be in the 2016 GRISR. Mr. Pratt said it will be too soon because these wells will be installed in 2017.

Program Update: Activities Completed, In Progress, and Upcoming (see Attachment 10)

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: Site SS016 Soil Data Gaps Investigation Work Plan; Multi-Site Bioaugmentation Technology Demonstration Work Plan.

Newly Completed Fieldwork: Site SS014 bioreactor installation; Sites ST028 and ST032 well decommissioning; Site SS016 soil data gap investigation; Site SD031 remedial soil sampling (3rd round); oil water separators step-out drilling.

In-Progress Documents (CERCLA): Community Involvement Plan; Site DP039 RA Construction Completion Report; Site FT005 Technology Demonstration Construction Completion Report; Site TS060 Action Memorandum; Site TS060 Removal Action Work Plan; Site LF044 Investigation Work Plan; 2015 Annual GRISR.

In-Progress Documents (POCO): Site FT004 POCO Soil Data Gap Investigation Work Plan; Sites ST028 and ST032 POCO Well Decommissioning Work Plan; Site CG508 POCO Well Decommissioning and Site Closeout Technical Memorandum.

In-Progress Fieldwork (CERCLA): multi-site bioaugmentation and EVO injection; Site SD034 technology demonstration bioreactor installation, Q4 2016 GRIP sampling.

In-Progress Fieldwork (POCO): Site OW040 soil excavation/surface restoration; Site OW057 soil excavation/surface restoration; Q4 2016 GRIP sampling.

Planned Documents (CERCLA): Sites SD033, SD043, and SS046 Risk Assessment Technical Memorandum (December); Site SD031 Remedial Investigation Report (January).

Planned Documents (POCO): Sites OW051 OW053, and OW054 POCO Evaluation/Closeout Report (December); Site ST028 POCO Well Decommissioning/Site Closeout Report (November); Site SS014 POCO Completion Report (January).

Fieldwork Planned (CERCLA): Site LF044 Berm Sampling (TBD); Site TS060 Removal Action (TBD).

Fieldwork Planned (POCO): Site OW055 close-in-place (October); Site FT004 POCO Soil Data Gap Investigation (TBD).

4. New Action Item Review

- Ms. Cumberland to reserve the real estate classroom for the RAB Meeting scheduled for April 2017.
- Mr. Duke to add a technology demonstration status report as an ongoing presentation for future RPM meetings, to keep the regulatory agencies informed on the progress of the technology demonstration projects.
- Mr. Duke to notify the regulatory agencies when SBBGWTP is back online.

5. PROGRAM/ISSUES/UPDATE

None.

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.	Lonnie Duke	Mr. Duke to provide a copy of the BA/BO and a recent fieldwork extension letter to the regulators.	16 November 2016	Open
3.	Jeannette Cumberland	Ms. Cumberland to reserve the real estate classroom for the RAB Meeting scheduled for April 2017.	16 November 2016	Open

4.	Lonnie Duke	Mr. Duke to add a technology demonstration status report as an ongoing presentation for future RPM meetings, to keep the regulatory agencies informed on the progress of the technology demonstration projects.	Ongoing	Open
5.	Lonnie Duke	Mr. Duke to notify the regulatory agencies when SBBGWTP is back online.	TBD (dependent on carbon vendor schedule)	Open

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

The RPM meeting is scheduled for 2:00 PM PST on 20 October 2016. **The call-in number is 1-866-203-7023. Enter the Participation code 5978-75-9736 then enter #.**

AGENDA

1. ADMINISTRATIVE

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

2. CURRENT PROJECTS

- A. TREATMENT PLANT OPERATION AND MAINTENANCE UPDATE

3. PRESENTATIONS

- A. TRIAD UPDATE
 - (1). SD031 INVESTIGATION UPDATE
 - (2). SITE ST027B BASELINE GW SAMPLING
- B. DP039 RACCR
- C. 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 MEETING, BASED ON THE DISCUSSION DURING THE REVIEW OF THE MASTER MEETING AND DOCUMENT SCHEDULE, WE ALLOW TIME TO HOLD A SEPARATE SPLINTER MEETING TO DISCUSS RESPONSES TO AGENCY COMMENTS ON THOSE DOCUMENTS THAT ARE IN PROGRESS, OR OTHER ISSUES IF NEEDED. ALL PARTICIPANTS ARE WELCOME TO PARTICIPATE.

(2016)
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.)
—	01-20-16	—
02-17-16	—	—
—	03-16-16	—
04-21-16 (Thursday 2:00 PM)	—	04-21-16
—	05-18-16	—
06-15-16	—	—
—	07-20-16	—
08-17-16	—	—
—	09-21-16	—
10-20-16 (Thursday 2:00 PM)	—	10-20-16 ²
—	11-16-16	—
—	—	—

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

² Note: RAB tour in lieu of RAB meeting (10:00 to 12:00).

(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	Action Memorandum for Non-Time Critical Removal Action at Site TS060 (Old Skeet Range) Travis AFB, Glenn Anderson CH2M HILL, Doug Berwick CAPE, Meg Greenwald
Scoping Meeting	NA	NA
Predraft to AF/Service Center	08-23-16	03-30-16
AF/Service Center Comments Due	09-07-16	04-13-16
Draft to Agencies	09-28-16	05-16-16
Draft to RAB	09-28-16	05-16-16
Agency Comments Due	10-28-16	06-27-16
Response to Comments Meeting	11-16-16	07-20-16
Agency Concurrence with Remedy	NA	NA
Public Comment Period	NA	7-7-16 to 8-7-16
Public Meeting	NA	NA
Response to Comments Due	12-02-16	09-01-16 (10-13-16)
Draft Final Due	12-02-16	09-01-16 (10-13-16)
Final Due	01-04-17	10-03-16 (11-14-16)

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 TS060 Removal Action Work Plan Travis AFB, Glenn Anderson CH2M HILL, Doug Berwick CAPE, Meg Greenwald	Multi-Site Bioaugmentation Technology Demonstration Work Plan Travis AFB, Glenn Anderson CH2M HILL, Levi Pratt
Scoping Meeting	NA	NA
Predraft to AF/Service Center	04-14-16	05-06-16
AF/Service Center Comments Due	04-28-16	05-20-16
Draft to Agencies	06-20-16	06-23-16
Draft to RAB	06-20-16	06-23-16
Agency Comments Due	07-27-16	07-25-16
Response to Comments Meeting	08-17-16	08-17-16
Response to Comments Due	08-31-16 (12-20-16)	09-09-16 (09-22-16)
Draft Final Due	NA	NA
Final Due	08-31-16 (12-20-16)	09-09-16 (09-22-16)
Public Comment Period	NA	NA
Public Meeting	NA	NA

Travis AFB Master Meeting and Document Schedule

SECONDARY DOCUMENTS		
Life Cycle	Site SS016 Soil Data Gap Investigation Work Plan Travis AFB, Glenn Anderson CH2M HILL, Doug Berwick CAPE, Meg Greenwald	Site LF044 Investigation Work Plan Travis AFB, Glenn Anderson CH2M HILL, Doug Berwick CAPE, Meg Greenwald
Scoping Meeting	NA	NA
Predraft to AF/Service Center	03-24-16	04-26-16
AF/Service Center Comments Due	04-07-16	05-10-16
Draft to Agencies	05-11-16	06-27-16
Draft to RAB	05-11-16	06-27-16
Agency Comments Due	06-13-16	07-28-16
Response to Comments Meeting	06-15-16	08-17-16
Response to Comments Due	07-01-16 (09-23-16)	08-31-16 (02-22-17)
Draft Final Due	NA	NA
Final Due	07-01-16 (09-23-16)	08-31-16 (02-22-17)
Public Comment Period	NA	NA
Public Meeting	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	Sites ST028 and ST032 POCO Well Decommissioning Work Plan Travis AFB, Glenn Anderson CH2M HILL, Doug Berwick CAPE, Meg Greenwald
Scoping Meeting	NA	NA
Predraft to AF/Service Center	06-03-16	09-01-16
AF/Service Center Comments Due	06-17-16	09-15-16
Draft to Agencies	07-19-16	09-29-16
Draft to RAB	07-19-16	09-29-16
Agency Comments Due	08-19-16	10-31-16
Response to Comments Meeting	09-21-16	11-16-16
Response to Comments Due	10-06-16 (01-19-17)	11-30-16 (10-21-16)
Draft Final Due	NA	NA
Final Due	10-06-16 (01-19-17)	11-30-16 (10-21-16)
Public Comment Period	NA	NA
Public Meeting	NA	NA

Travis AFB Master Meeting and Document Schedule

INFORMATIONAL DOCUMENTS		
Life Cycle	Quarterly Newsletters (October 2016) Travis, Glenn Anderson	2015 Annual GRISR Travis AFB, Glenn Anderson CH2M HILL, Leslie Royer
Scoping Meeting	NA	NA
Predraft to AF/Service Center	NA	05-03-16
AF/Service Center Comments Due	NA	06-03-16
Draft to Agencies	09-28-16	07-07-16
Draft to RAB	NA	07-07-16
Agency Comments Due	10-11-16	08-29-16
Response to Comments Meeting	TBD	09-21-16
Response to Comments Due	10-12-16	11-09-16
Draft Final Due	NA	NA
Final Due	10-12-16	11-09-16
Public Comment Period	NA	NA
Public Meeting	NA	NA

Travis AFB Master Meeting and Document Schedule

INFORMATIONAL DOCUMENTS		
Life Cycle	Site FT005 Technology Demonstration Construction Completion Report Travis AFB, Glenn Anderson CH2M HILL, Levi Pratt	Site DP039 Remedial Action Construction Completion Report Travis AFB, Glenn Anderson CH2M HILL, Levi Pratt
Scoping Meeting	NA	NA
Predraft to AF/Service Center	06-30-16	08-05-16
AF/Service Center Comments Due	07-15-16	08-19-16
Draft to Agencies	08-19-16	09-30-16
Draft to RAB	08-19-16	09-30-16
Agency Comments Due	09-19-16	10-31-16
Response to Comments Meeting	10-20-16	11-16-16
Response to Comments Due	11-03-16	12-01-16
Draft Final Due	NA	NA
Final Due	11-03-16	12-01-16
Public Comment Period	NA	NA
Public Meeting	NA	NA

Travis AFB Master Meeting and Document Schedule

INFORMATIONAL POCO DOCUMENTS		
Life Cycle	Site CG508 POCO Well Decommissioning and Site Closeout Technical Memorandum Travis AFB, Glenn Anderson CH2M HILL, Tony Chakurian	Sites OW051, OW053, and OW054 POCO Evaluation/Closeout Report Travis AFB, Glenn Anderson CH2M HILL, Doug Berwick
Scoping Meeting	NA	NA
Predraft to AF/Service Center	09-20-16	11-04-16
AF/Service Center Comments Due	10-04-16	11-18-16
Draft to Agencies	10-05-16	12-06-16
Draft to RAB	10-05-16	12-06-16
Agency Comments Due	11-04-16	01-09-17
Response to Comments Meeting	11-16-16	01-18-17
Response to Comments Due	12-01-16	02-01-17
Draft Final Due	NA	NA
Final Due	12-01-16	02-01-17
Public Comment Period	NA	NA
Public Meeting	NA	NA

Travis AFB Master Meeting and Document Schedule

HISTORY	
Life Cycle	Site SD034 Technology Demonstration Work Plan Travis AFB, Glenn Anderson CH2M HILL, Levi Pratt
Scoping Meeting	NA
Predraft to AF/Service Center	03-22-16
AF/Service Center Comments Due	04-05-16
Draft to Agencies	05-19-16
Draft to RAB	05-19-16
Agency Comments Due	06-20-16
Response to Comments Meeting	08-17-16
Response to Comments Due	08-30-16 (09-07-16)
Draft Final Due	NA
Final Due	08-30-16 (09-07-16)
Public Comment Period	NA
Public Meeting	NA

Central Groundwater Treatment Plant Monthly Data Sheet

Report Number: 206

Reporting Period: 31 August 2016 – 30 September 2016

Date Submitted: 17 October 2016

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 September 2016 reporting period.

Table 1 – Operations Summary – September 2016				
Initial Data Collection:		8/31/2016 12:30	Final Data Collection:	9/30/2016 09:30
Operating Time:		Percent Uptime:	Electrical Power Usage:	
CGWTP:	717 hours	CGWTP:	100%	CGWTP: 2,481 kWh (2,724 lbs CO ₂ generated ^a)
Gallons Treated (discharge to storm sewer): 1,523,700 gallons ^b		Gallons Treated Since January 1996: 530.4 million gallons		
VOC Mass Removed from groundwater: 3.18 lbs ^c		VOC Mass Removed Since January 1996: 2,758 lbs from groundwater 8,686 lbs from vapor		
Rolling 12-Month Cost per Pound of Mass Removed: \$2,565 ^d				
Monthly Cost per Pound of Mass Removed: \$1,785 ^d				
a SiteWise™ estimate that 1 kilowatt hour generated produces 0.74 pounds of GHG. Value also includes approximately 888 pounds of GHG from GAC change out.				
b Volume includes 8,758 gallons of groundwater collected during removal of oil/water separator OW055.				
c Calculated using September 2016 EPA Method SW8260C analytical results.				
d Costs include operations and maintenance, reporting, analytical laboratory, project management, and utility costs related to operation of the system.				

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

Table 2 – CGWTP Average Flow Rates ^a – September 2016	
Location	Average Flow Rate Groundwater (gpm)
EW001x16	15.3
EW002x16	7.8
EW003x16	0.1
EW605x16	6.7
EW610x16	3.2
CGWTP	35.4
^a Flow rates calculated by dividing total gallons processed by system operating time for the month or the average of the instantaneous readings. gpm = gallons per minute	

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

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

Summary of O&M Activities

Monthly groundwater samples were collected at the CGWTP on 1 September 2016. Sample results are presented in Table 4. The total VOC concentration (250.09 µg/L) in the September 2016 influent sample has decreased from the August 2016 sample (277.99 µg/L). TCE was the primary VOC detected in the influent sample at a concentration of 202 µg/L. Cis-1,2-DCE and vinyl chloride were detected at low concentrations in the sample collected between the carbon vessels, and vinyl chloride was detected in the sample collected after second carbon vessel. No VOC constituents were detected in the system effluent sample. Travis AFB will continue to monitor influent, midpoint, and effluent concentrations at the CGWTP for carbon breakthrough, though the carbon treatment remained effective in September 2016.

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

The Site DP039 bioreactor continued 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. On 8 September, the bioreactor was taken off line and will remain offline for four weeks, then operational for various times in an effort to optimize distribution of total organic carbon (TOC) through the subgrade biogeochemical reactor (SBGR). After four (4) weeks of being off line, baseline samples will be collected from monitoring wells surrounding the bioreactor. Once these baseline samples have been collected, the bioreactor will operate in a one-week cycle for three (3) weeks (one week on, one week off, one week on) before additional samples are collected. After this first round of samples, the bioreactor will be taken off line again for four (4) weeks before starting a two (2) week operational cycle. In total, the pulsed mode operation will consist of three (3) different time scales: one week, two week, and three week pulsed modes. Samples will be collected after each round of sampling. This will help to optimize the duration of each pulsed mode cycle of the Site DP039 bioreactor.

Optimization Activities

No optimization activities occurred at the CGWTP in September 2016. 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 2,724 pounds of GHG during September 2016. This is a slight increase from the August 2016 amount of 2,713 pounds.

TABLE 4

Summary of Groundwater Analytical Data for September 2016 – Central Groundwater Treatment Plant

				1 September 2016 (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							
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	43.2	1.23	ND	ND
1,2-Dichlorobenzene	5.0	0.15	0	0.39 J	ND	ND	ND
1,3-Dichlorobenzene	5.0	0.15	0	0.61	ND	ND	ND
1,4-Dichlorobenzene	5.0	0.15	0	0.39 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	0.44 J	ND	ND	ND
Methylene Chloride	5.0	0.15	0	ND	ND	ND	ND
Methyl tert-Butyl Ether	1.0	0.15	0	ND	ND	ND	ND
Tetrachloroethene	5.0	0.15	0	0.53	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
Trichloroethene	5.0	0.15 – 1.5	0	202	ND	ND	ND
trans-1,2-Dichloroethene	5.0	0.15	0	2.26	ND	ND	ND
Vinyl Chloride	0.5	0.15	0	0.27 J	0.22 J	0.27 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 Suspended Solids (mg/L)	NA	0.6	0	0.6 J	NM	NM	NM
Total Dissolved Solids (mg/L)	NA	4.2	0	NM	NM	NM	835
Total Petroleum Hydrocarbons – Gasoline	50	30	0	78.7 J	NM	NM	ND
Total Petroleum Hydrocarbons – Diesel	50	29	0	ND	NM	NM	ND
Total Petroleum Hydrocarbons – Motor Oil	50 (trigger)	25	0	ND	NM	NM	ND

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

Notes:

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

NA = not applicable

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

ND = not detected

NM = not measured

µg/L = micrograms per liter

mg/L = milligrams per liter

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	28 August 2015	11 September 2015
	1 October 2015	9 October 2015
	23 October 2015	6 November 2015
	20 November 2015	8 December 2015
	21 December 2015	31 December 2015
	15 January 2016	1 February 2016
	12 February 2016	26 February 2016
	11 March 2016	28 March 2016
	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
MW = Monitoring Well		

Figure 1

CGWTP Total VOC Influent Concentrations and Average Flowrate Twelve Month History

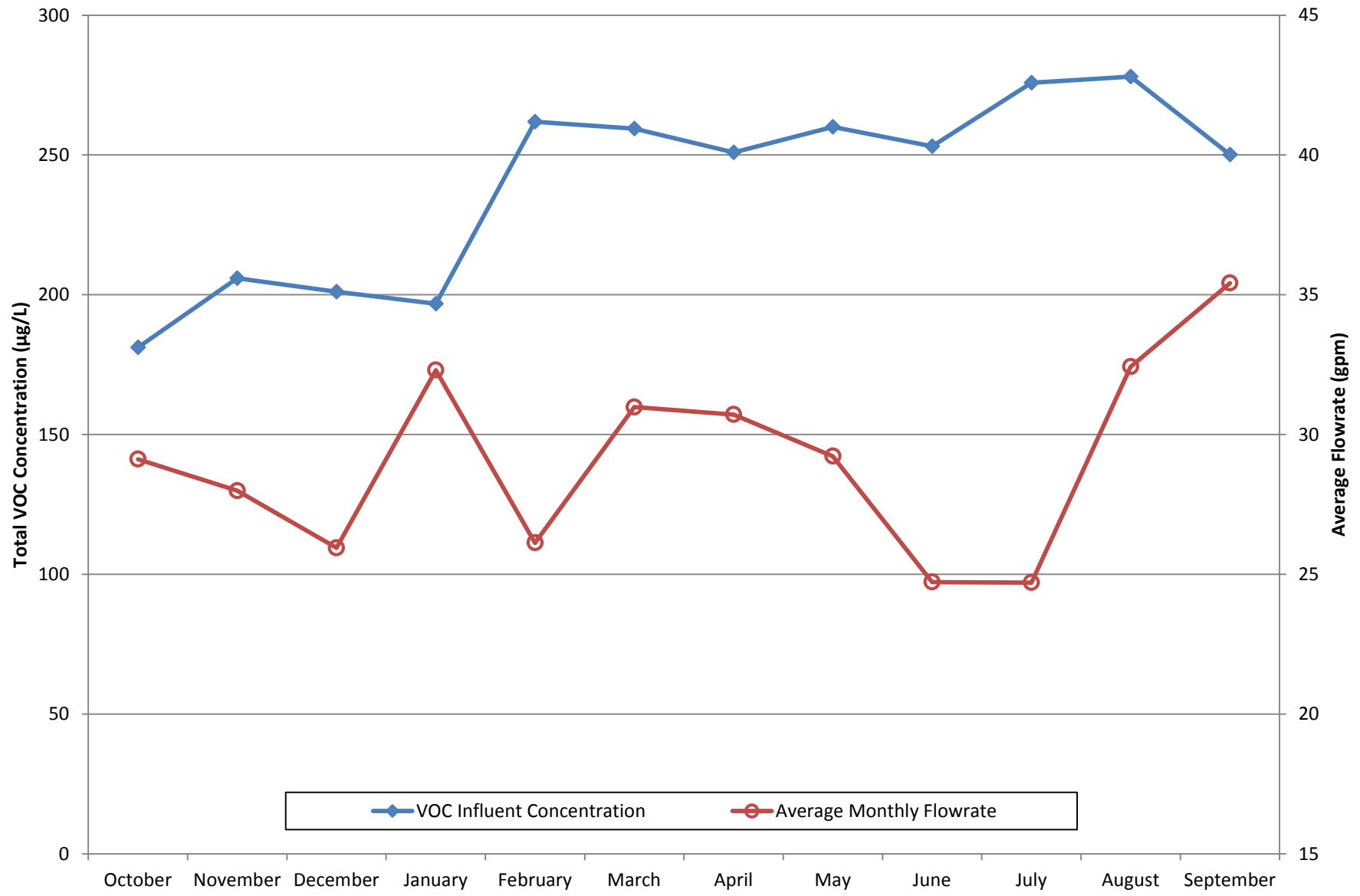
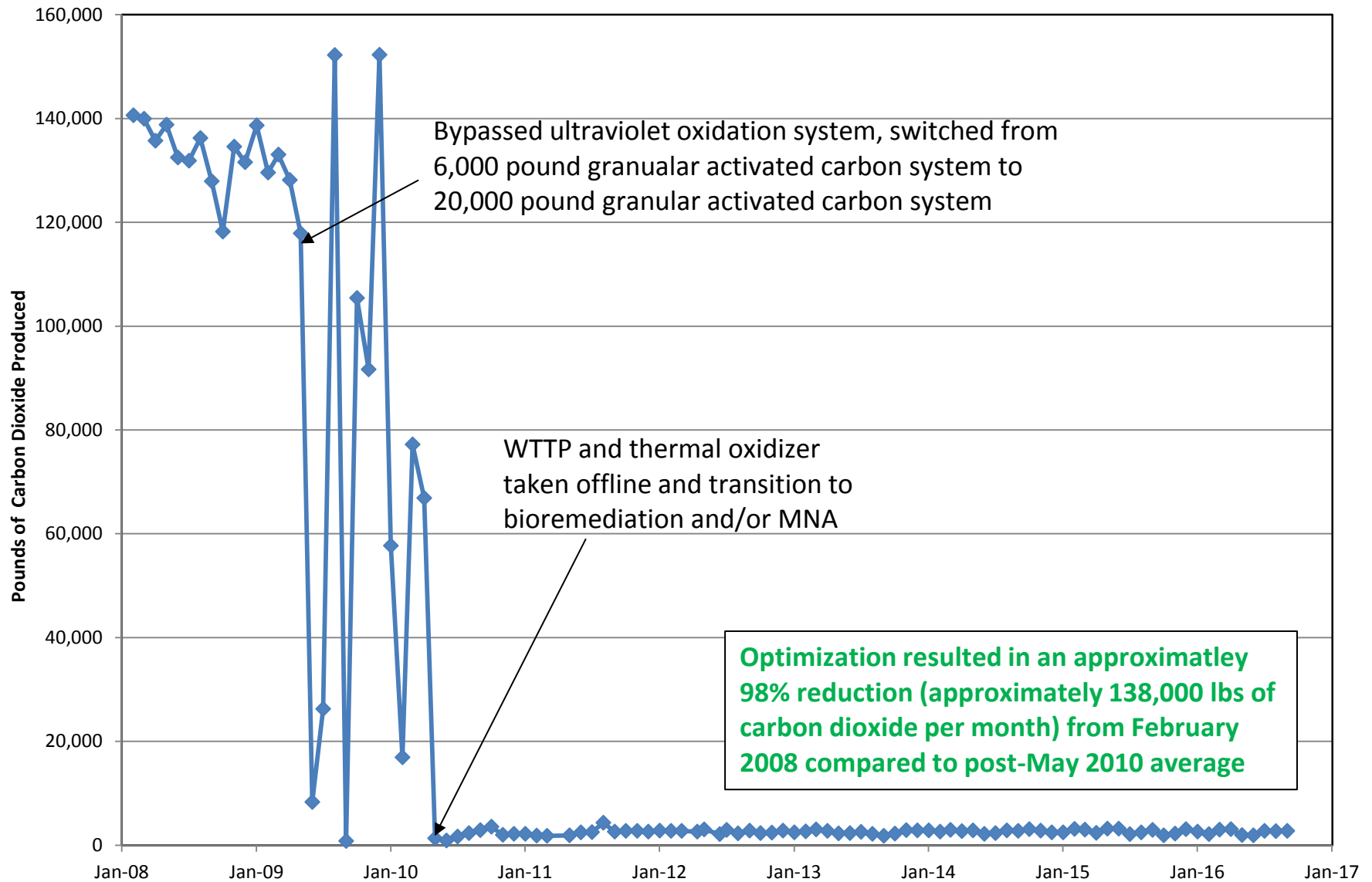


Figure 2

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



Subarea LF007C Groundwater Treatment Plant

Monthly Data Sheet

Report Number: 155

Reporting Period: 31 August 2016 – 30 September 2016

Date Submitted: 17 October 2016

This monthly data sheet presents information regarding the Subarea LF007C Groundwater Treatment Plant (LF007C GWTP) and associated remedial process optimization (RPO) activities.

System Metrics

Table 1 presents operational data from the September 2016 reporting period:

Table 1 – Operations Summary – September 2016				
Initial Data Collection:		8/31/2016 10:10	Final Data Collection:	9/30/2016 11:45
Operating Time:		Percent Uptime:		Electrical Power Usage ^a :
LF007C GWTP:	722 hours	LF007C GWTP	100%	LF007C GWTP: 0 kWh
Gallons Treated: 149,390 gallons		Gallons Treated Since March 2000: 85.6 million gallons		
Volume Discharged to Duck Pond: 149,390 gallons				
VOC Mass Removed: 1.57 x 10 ⁻³ pounds ^b		VOC Mass Removed Since March 2000: 174.36 pounds (Groundwater)		
Rolling 12-Month Cost per Pound of Mass Removed: Not Measured ^c				
Monthly Cost per Pound of Mass Removed: Not Measured ^c				
^a The LF007C GWTP operates on solar power only.				
^b VOCs from September 2016 influent sample detected by EPA Method SW8260C.				
^c Value not calculated since measurement does not accurately represent the cost effectiveness of the system.				

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

Table 2 – LF007C GWTP Average and Total Flow Rates – September 2016		
Location	Average Flow Rate (gpm) ^a	Total Gallons Processed (gallons)
EW614x07	2.7	117,164
EW615x07	0.7	30,937
LF007C GWTP	3.45	149,390
^a Flow rates calculated by dividing total gallons processed by system operating time for the month or the average of the instantaneous readings. gpm = gallons per minute		

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

Table 3 – Summary of System Shutdowns					
Location	Shutdown ^a		Restart ^a		Cause
	Date	Time	Date	Time	
LF007C GWTP	None.	--		--	None.
-- = Time not recorded ^a Shutdown and restart times estimated based on field notes LF007C GWTP = Subarea LF007C Groundwater Treatment Plant					

Summary of O&M Activities

Analytical data from the 1 September 2016 sampling event are presented in Table 4. The only compound detected was TCE (1.26 µg/L), which was detected at the influent sample location. No contaminants were detected at the midpoint or effluent sampling locations. Analytical data continue to indicate effective treatment of the influent process stream.

Figure 1 presents a chart of influent concentrations (total VOCs) at the LF007C GWTP versus time for the past twelve months. VOC concentrations, primarily TCE, have generally continued to decrease over the last twelve months. The average flow rate through the LF007C GWTP in September 2016 (3.45 gpm) decreased slightly from the flow rate measured in August 2016 (3.98 gpm). The decrease in flow from EW614x07 may be a result of continued pumping from EW615x07, and also the prolonged period of dry weather.

Optimization Activities

No optimization activities occurred at the LF007C GWTP in September 2016.

Sustainability

Travis AFB is committed to decreasing the amount of GHG produced directly (waste streams discharging GHG) or indirectly (GHG produced as related to electrical energy consumption) from all systems across Travis AFB. Travis AFB continues to optimize each treatment plant to reduce the amount of electrical energy consumed, and to implement sustainable treatment plant optimization programs, such as the solar arrays employed to power the system.

Figure 2 presents the historical GHG production from the systems associated with the NGWTP and LF007C GWTP. The LF007C GWTP is now a solar-only operated treatment system and no longer generates GHG, with exception of a small amount of GHG generated from changing out the GAC.

TABLE 4

Summary of Groundwater Analytical Data For September 2016 – Subarea LF007C Groundwater Treatment Plant

Constituent	Instantaneous Maximum* (µg/L)	Detection Limit (µg/L)	N/C	1 September 2016 (µg/L)		
				Influent	After Carbon 1	Effluent
Halogenated Volatile Organics						
Bromodichloromethane	5.0	0.15	0	ND	ND	ND
Bromoform	5.0	0.15	0	ND	ND	ND
Carbon Tetrachloride	0.5	0.15	0	ND	ND	ND
Chloroform	5.0	0.15	0	ND	ND	ND
Dibromochloromethane	5.0	0.15	0	ND	ND	ND
1,3-Dichlorobenzene	5.0	0.15	0	ND	ND	ND
1,4-Dichlorobenzene	5.0	0.15	0	ND	ND	ND
1,1-Dichloroethane	5.0	0.15	0	ND	ND	ND
1,2-Dichloroethane	0.5	0.15	0	ND	ND	ND
1,1-Dichloroethene	5.0	0.15	0	ND	ND	ND
cis-1,2-Dichloroethene	5.0	0.15	0	ND	ND	ND
trans-1,2-Dichloroethene	5.0	0.15	0	ND	ND	ND
2-Hexanone	NA	0.50	0	ND	ND	ND
Methylene Chloride	5.0	0.15	0	ND	ND	ND
Tetrachloroethene	5.0	0.15	0	ND	ND	ND
1,1,1-Trichloroethane	5.0	0.15	0	ND	ND	ND
1,1,2-Trichloroethane	5.0	0.15	0	ND	ND	ND
Trichloroethene	5.0	0.15	0	1.26	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 Suspended Solids (mg/L)	NA	0.6	0	2.00 J	NM	NM
Total Dissolved Solids (mg/L)	NA	4.2	0	NM	NM	2,060
Total Petroleum Hydrocarbons – Gasoline	50	30	0	ND	NM	ND
Total Petroleum Hydrocarbons – Diesel	50	24	0	ND	NM	ND
Total Petroleum Hydrocarbons – Motor Oil	100	24	0	ND	NM	ND

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

Notes:

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

NA = not applicable

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

ND = not detected

NM = not measured

µg/L = micrograms per liter

mg/L = milligrams per liter

Figure 1

LF007CGWTP Total VOC Influent Concentrations and Average Flowrate Twelve Month History

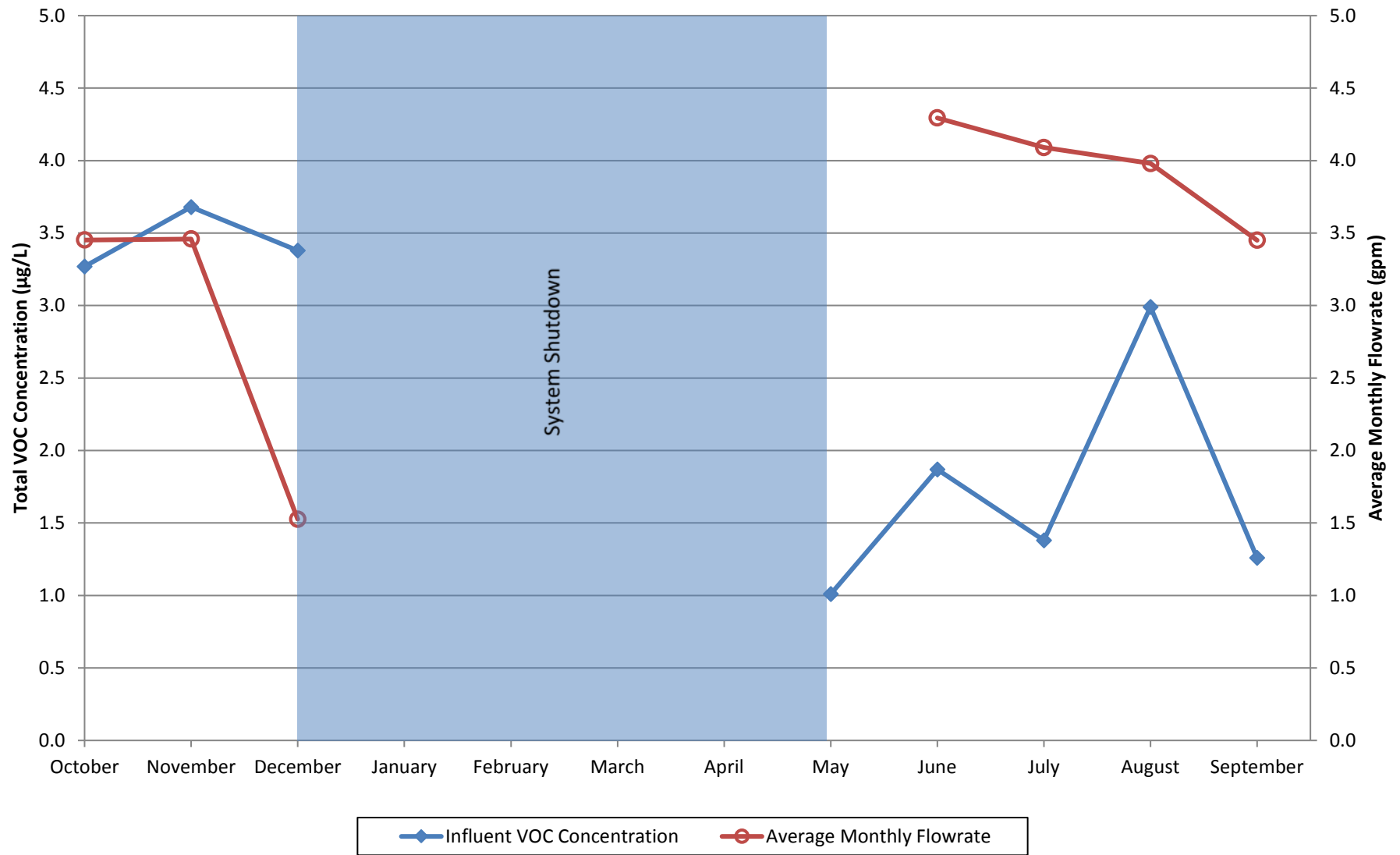
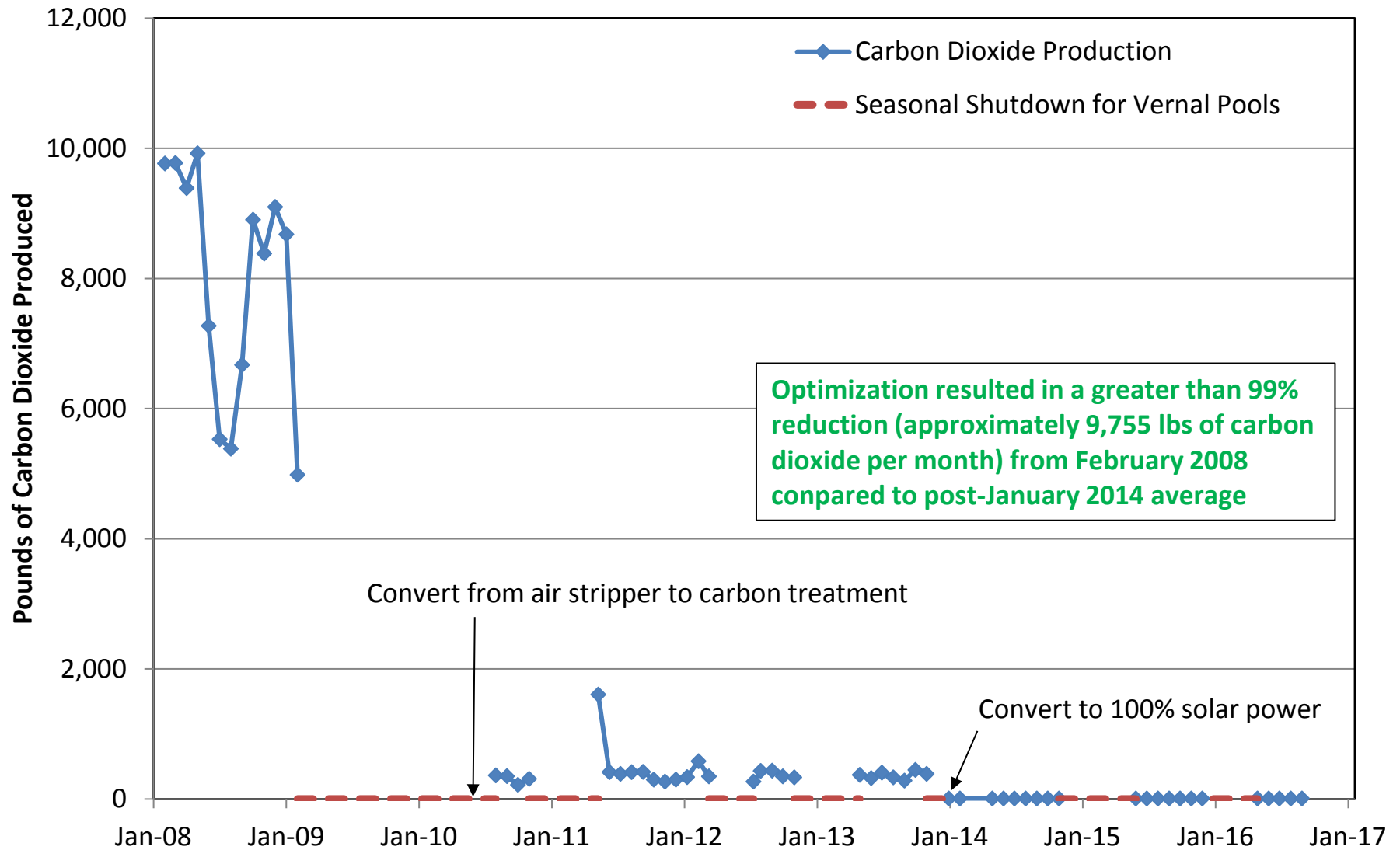


Figure 2

Equivalent Pounds of Carbon Dioxide Produced by the NGWTP/LF007C Groundwater Treatment Plant



Note: Dashed line represents seasonal shutdowns due to the presence of vernal pools at Site LF007C during which no carbon dioxide production occurred.

Site ST018 Groundwater Treatment Plant

Monthly Data Sheet

Report Number: 067

Reporting Period: 31 August 2016 – 30 September 2016

Date Submitted: 17 October 2016

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

System Metrics

Table 1 presents operation data from the September 2016 reporting period.

Table 1 – Operations Summary – September 2016			
Initial Data Collection:	8/31/2016 13:30	Final Data Collection:	9/30/2016 09:55
Operating Time:		Percent Uptime:	Electrical Power Usage:
ST018GWTP: 716 hours		ST018GWTP: 100%	ST018GWTP: 121 kWh (490 lbs CO ₂ generated ^a)
Gallons Treated: 206,815 gallons		Gallons Treated Since March 2011: 10.94 million gallons	
Volume Discharged to Sanitary Sewer: 206,815 gallons		Final Totalizer Reading: 10,942,004 gallons	
Cumulative Volume Discharged to Sanitary Sewer since 1 November 2014: 4,445,830 gallons			
MTBE, BTEX, VOC, TPH Mass Removed: 0.31 lbs^b		MTBE, BTEX, VOC, TPH Mass Removed Since March 2011: 39.3 lbs	
MTBE (Only) Removed: 0.11 lbs^b		MTBE (Only) Mass Removed Since March 2011: 9.6 lbs	
Rolling 12-Month Cost per Total Pounds of Mass Removed: \$11,209 ^{bc}			
Monthly Cost per Pound of Mass Removed: \$17,665 ^{bc}			
^a SiteWise™ estimate that 1 kilowatt hour generated produces 0.74 pounds of GHG. Value also includes approximately 400 pounds of GHG from GAC change out. ^b Calculated using September 2016 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 – September 2016		
Location	Average Flow Rate Groundwater (gpm)^a	Hours of Operation
EW2014x18	1.2	716
EW2016x18	0.9	716
EW2019x18	0.9	716
EW2333x18	1.3	716
Site ST018 GWTP	4.8	716
^a Flow rates calculated by dividing total gallons processed by amount of operating time of the pump/system. gpm = gallons per minute ST018GWTP = Site ST018 Groundwater Treatment Plant		

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

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

Summary of O&M Activities

Monthly groundwater treatment samples were collected at the ST018GWTP on 1 September 2016. Results are presented in Table 4. The complete September 2016 laboratory data report is available upon request. The influent concentration for MTBE during the September 2016 sampling event was 67.9 µg/L, which is a slight decrease from the August 2016 sample result of 68.0 µg/L. TPH-g (31.1 J µg/L), TPH-d (49.5 J µg/L), TPH-mo (34.2 J µg/L) and 1,2-DCA (1.26 µg/L) were also detected in the influent sample. TPH-d (35.8 J µg/L) and TPH-mo (31.5 J µg/L) were detected after the first carbon vessel sampling location. No contaminant concentrations were detected after the second carbon vessel sampling location. MTBE was detected in the system effluent sampling location at a concentration of 3.25 µg/L. All detected 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 effluent contaminant concentrations and evaluate the condition of the carbon filter beds.

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 seasonally variable with an increasing trend between October 2015 and April 2016 and a decreasing trend since April 2016. The total influent concentrations have varied considerably throughout the past twelve months, which is due primarily to the TPH-g concentration;

however, overall concentrations have decreased. The MTBE concentration in the system influent has generally been holding steady.

Optimization Activities

No optimization activities occurred at the ST018GWTP in September 2016.

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 490 pounds of GHG during September 2016 and treated 206,815 gallons of water, which was a decrease from August 2016 (498 pounds, treating 221,500 gallons). The GHG levels have been increasing over the past approximately 1 ½ years, which is due to the addition of a new extraction well into the groundwater extraction and treatment system.

TABLE 4

Summary Of Groundwater Analytical Data for September 2016 – Site ST018 Groundwater Treatment Plant

Constituent	Instantaneous Maximum* (µg/L)	Detection Limit (µg/L)	N/C	1 September 2016 (µg/L)			
				Influent	After Carbon 1	After Carbon 2	System Effluent
Fuel Related Constituents							
Methyl tert-Butyl Ether	6,400	0.15	0	67.9	NM	ND	3.25
Benzene	25,000 ^a	0.15	0	ND	NM	ND	ND
Ethylbenzene	25,000 ^a	0.15	0	ND	NM	ND	ND
Toluene	25,000 ^a	0.15	0	ND	NM	ND	ND
Total Xylenes	25,000 ^a	0.15 – 0.30	0	ND	NM	ND	ND
Total Petroleum Hydrocarbons – Gasoline	50,000 ^b	30	0	31.1 J	ND	NM	ND
Total Petroleum Hydrocarbons – Diesel	50,000 ^b	24 – 25	0	49.5 J	35.8 J	NM	ND
Total Petroleum Hydrocarbons – Motor Oil	100,000	24 – 25	0	34.2 J	31.5 J	NM	ND
Other							
1,2-Dichloroethane	0.5	0.15	0	1.26	NM	ND	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

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

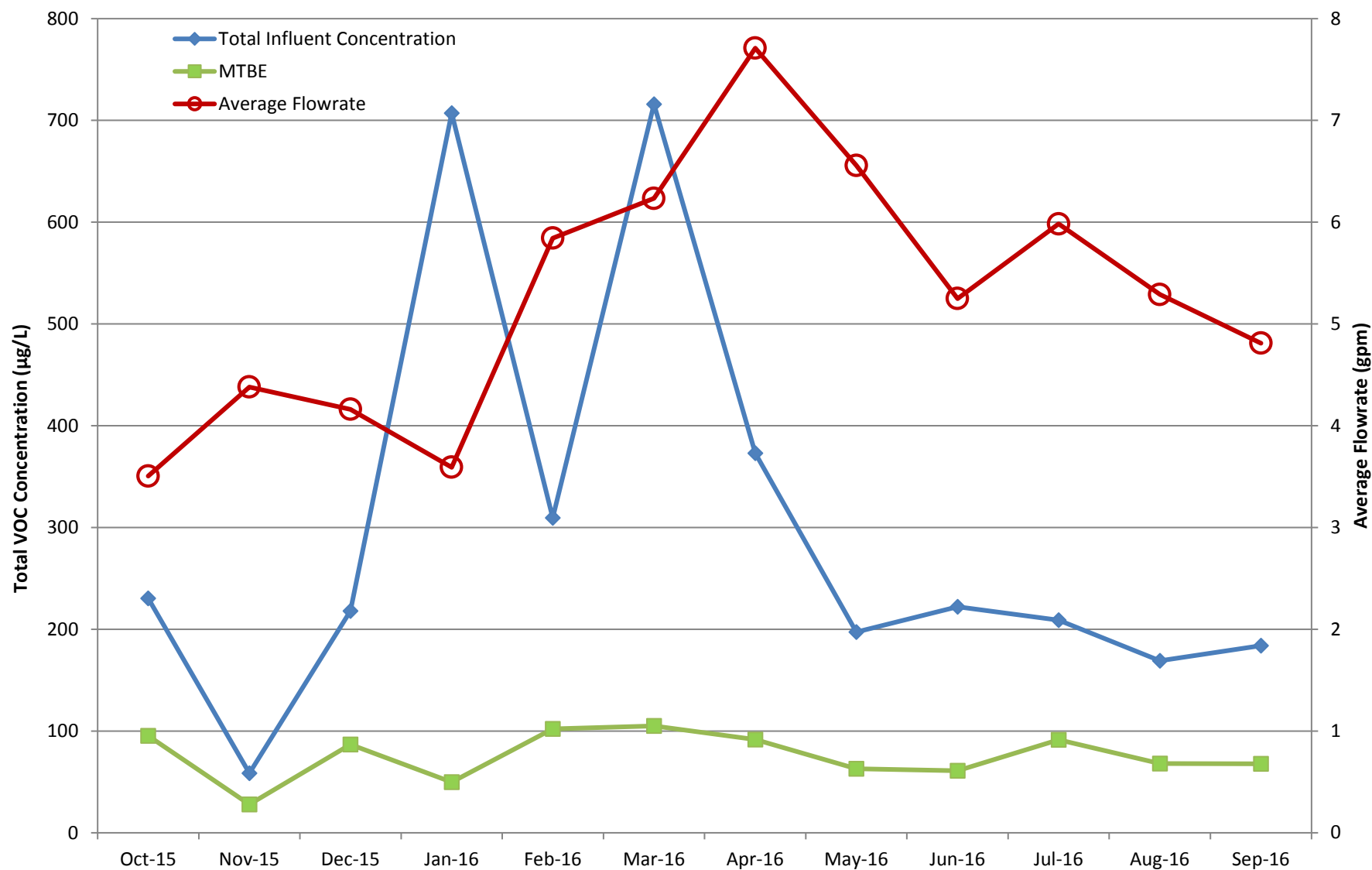
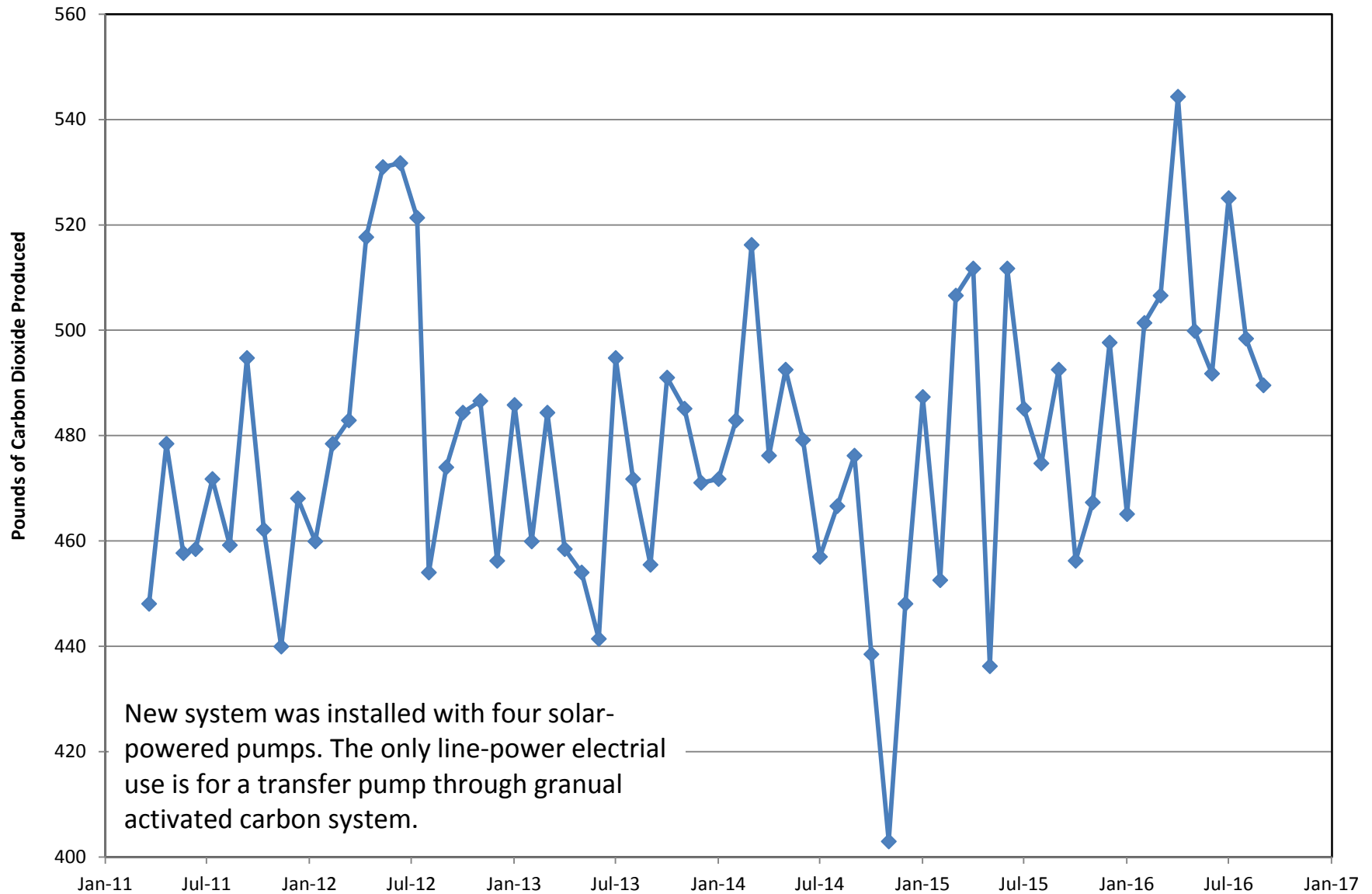


Figure 2

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



Site SD031 Soil Remedial Investigation Triad Update

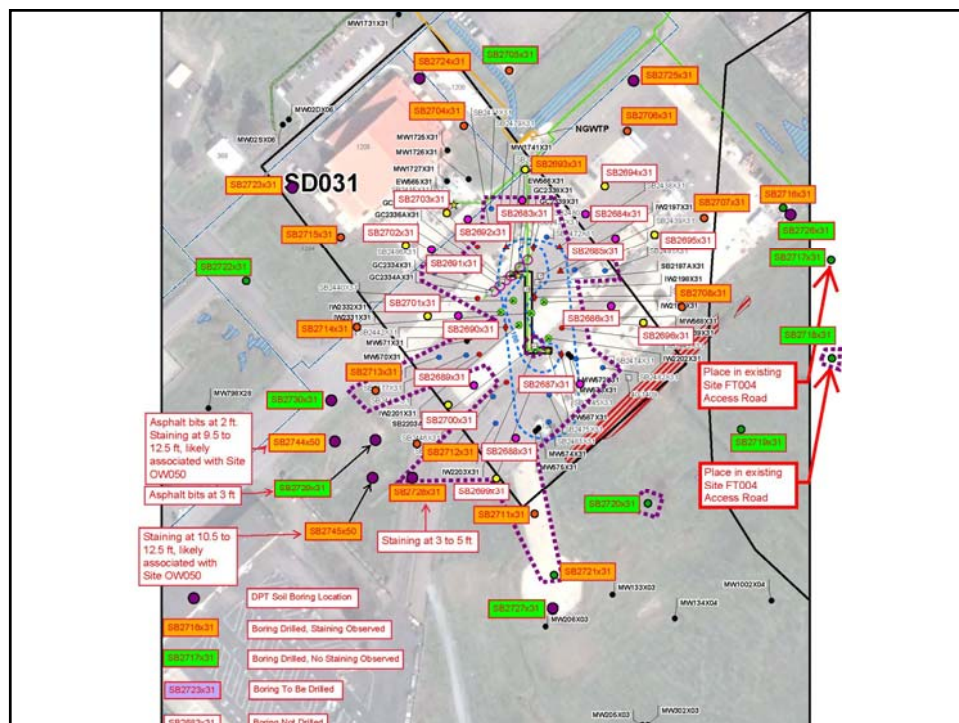
RPM Meeting
October 20, 2016

Site SD031 Soil Investigation Status

- Detected visible soil staining while installing the groundwater technology demonstration.
- Secured funding to conduct a soil remedial investigation and feasibility study.
- Completed first round of sampling, and were not able to delineate the boundaries of the soil plume.
- Stepped-out with 18 hand auger borings, and found the limits of contamination in 4 borings.
 - SB2705x31, SB2716x31, SB2717x31, and SB2719x31
- Some borings with stained soil did not have contamination above the screening levels.

Site SD031 Soil Investigation Status

- Drilled 10 DPT soil borings along the known extent of the soil plume.
- Four of the soil borings were not visibly stained.
 - SB2726x31, SB2727x31, SB2729x31, and SB2730x31
- Two of the soil borings (SB2744x50 and SB2745x50) were stained but at depths deeper than adjacent Site SD031 boring (SB2728x31) and are likely associated with impacts from Site OW050.

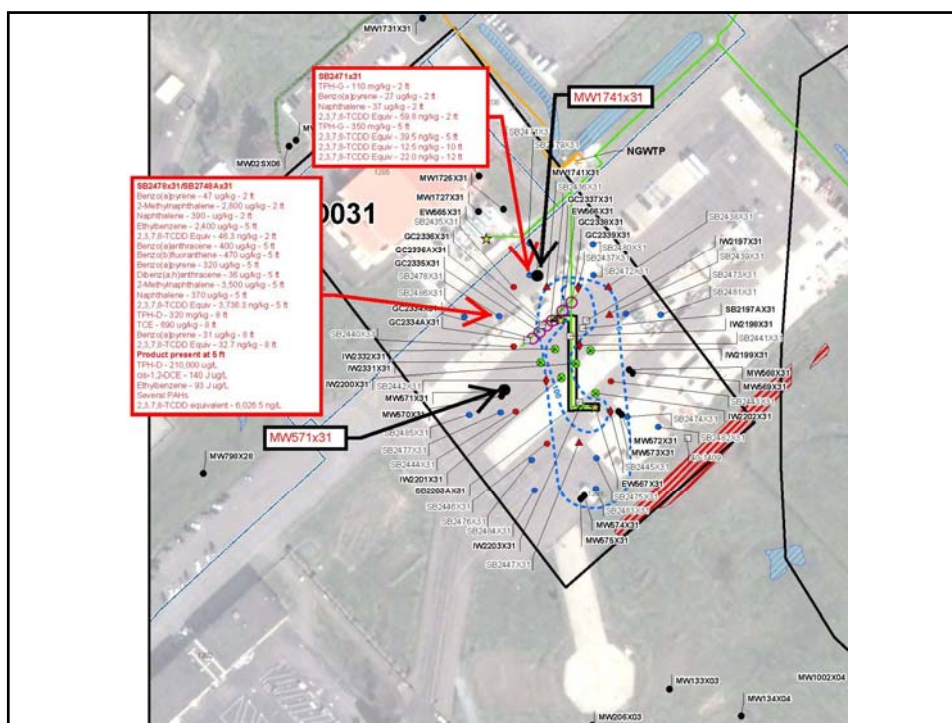


Site SD031 Soil Investigation Status

- Hexavalent chromium has been observed in most of the soil samples throughout Site SD031 at concentrations above the screening levels (0.30 mg/kg).
 - Maximum concentration of 1.5 mg/kg
- Inorganic Reference Concentrations for hexavalent chromium have not been established at Travis AFB by previous background study.
- We will be conducting a background study to establish Inorganic Reference Concentrations for hexavalent chromium in shallow and deep soil.

Site SD031 Soil Investigation Status

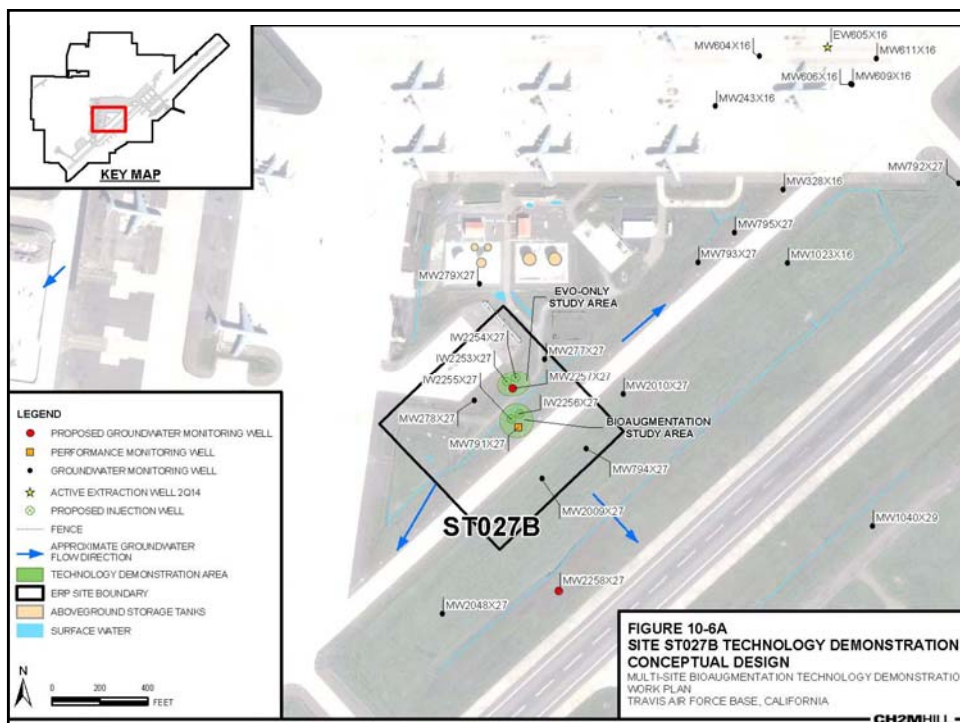
- Groundwater samples were collected from existing monitoring wells MW571x31 and MW1741x31.
- We are awaiting the analytical results of the groundwater sampling.



Questions

Site ST027B Technology Demonstration Baseline Sampling Results

RPM Meeting
October 20, 2016



Field Work

- Drilled, installed, and developed monitoring and injection wells from September 13th through 21st.
- During drilling, bedrock was encountered between 10 and 18.5 ft bgs.
- Borings were initially dry when drilled, with the exception MW2258x27.
 - GW was encountered in MW2258x27 at 13 ft bgs.
- Crystalline gypsum was encountered as disseminations or fracture filling in most of the borings starting from between 7 and 10 ft bgs.
 - Up to 50% of disseminated gypsum was present in IW2255x27 at 10 ft bgs.
 - No gypsum in MW2258x27.

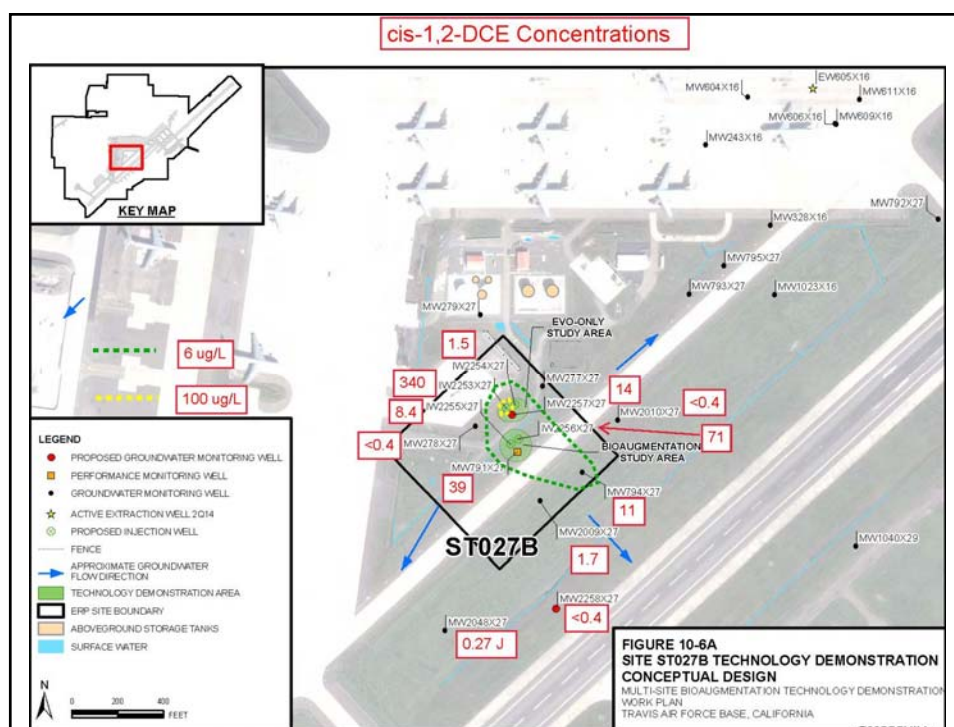
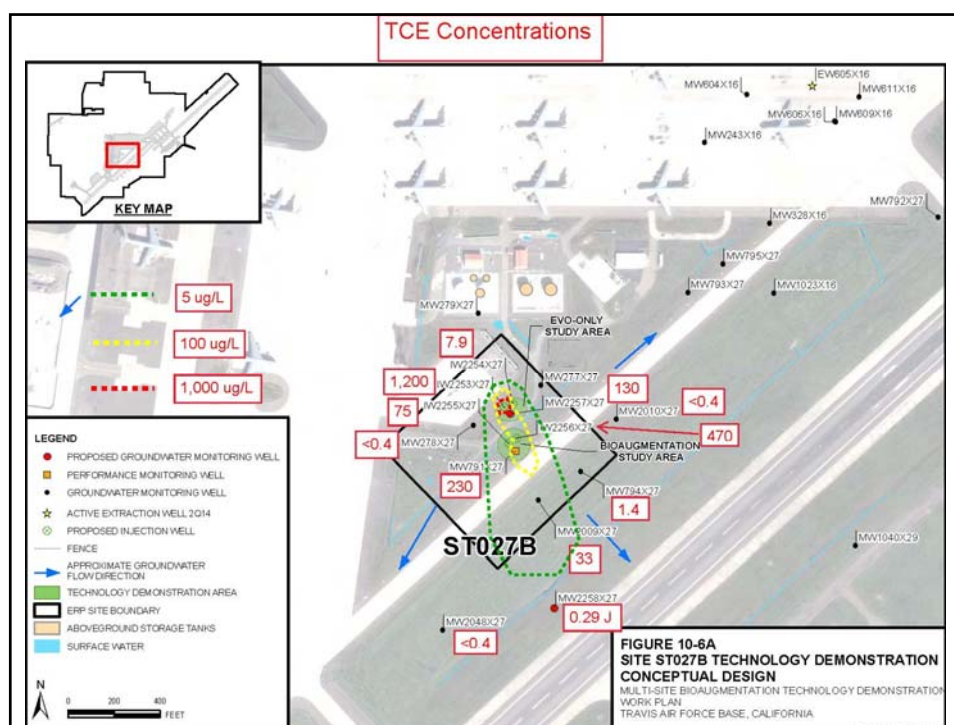


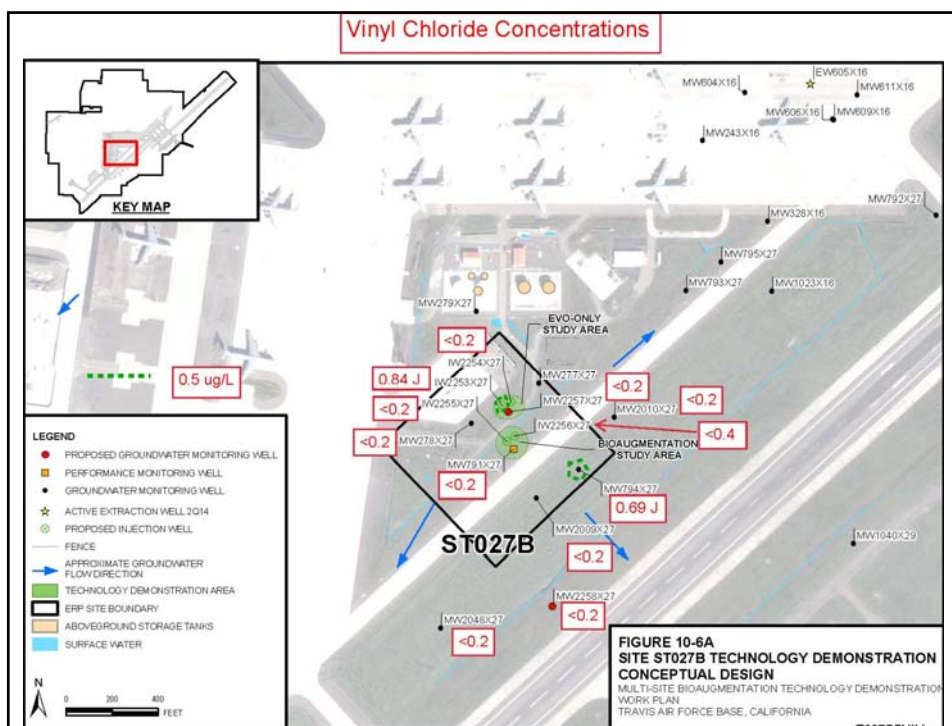
Field Work

- The injection wells were all screened from 13 to 33 ft bgs.
- To ensure that potential areas for groundwater were covered, the filter pack for each injection well was extended to either 9 or 10 ft bgs.
- Monitoring well MW2257x27, which is in the injection well area, was screened from 9 to 19 ft bgs.
- Monitoring well MW2258x27, which is the down gradient well, was screened from 13 to 23 ft bgs.

Baseline Analytical Results

- Maximum TCE concentration was 1,200 µg/L and was observed in injection well IW2253x27.
- Concentrations of TCE vary greatly in adjacent injection wells, likely due to the contamination being present in the bedrock and to being fracture controlled.
 - IW2253x27 (1,200 µg/L) vs. IW2254x27 (7.9 µg/L)
- The TCE concentration in monitoring well MW791x27 has decreased from 498 µg/L in 2012 to 230 µg/L in 2016
- Daughter products of TCE are present in the in several of the wells at Site ST027B.
 - Primarily cis-1,2-DCE, with some vinyl chloride.
- The number of Dehalococcoides present in MW791x27 and MW2257x27 are 2.60E+00 and 8.80E+00 cells/mL.
- The number of Dehalobacter spp. present for these same wells are 8.60E+02 and 1.75E+02 cells/mL.

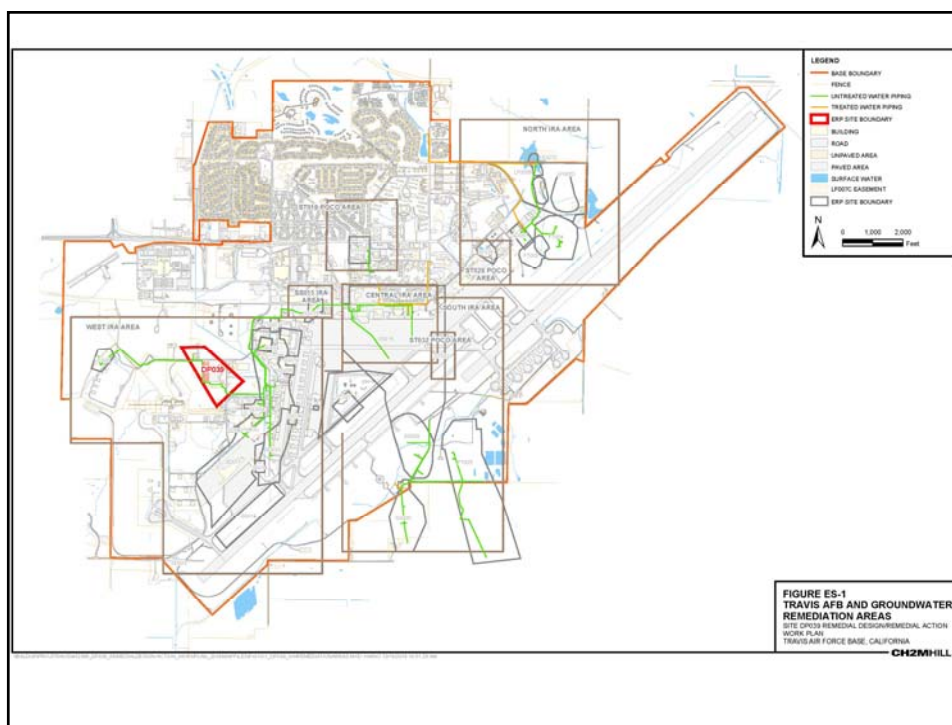




Questions

Site DP039 Remedial Action Construction Completion Report

RPM Meeting
October 20, 2016



Background

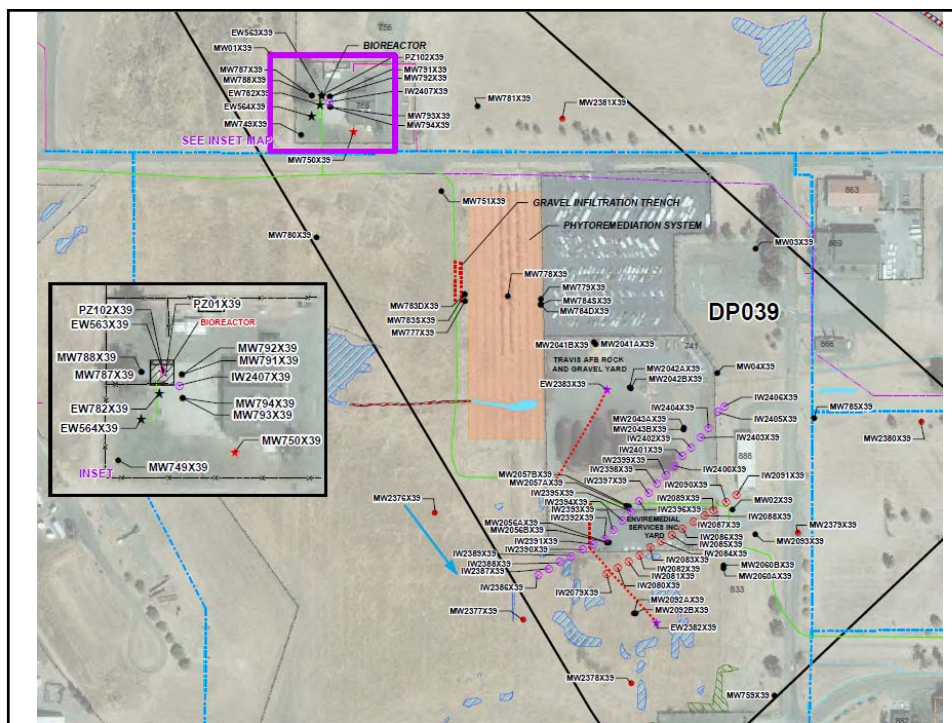
- Site DP039 primarily consists of former Building 755, which had been the Travis AFB Battery and Electric Shop.
- In 1968, Building 755 was originally used to test rocket engines, but only petroleum-based liquid fuel was used at the site as part of this testing.
- Before 1978, battery acid solutions and chlorinated solvents were poured into a sink within Building 755 and conveyed by a pipeline less than 100 feet to a rock-filled acid neutralization sump.
- This practice was discontinued in 1978, when the pipeline was dismantled and reconnected to the sanitary sewer line.
- In July 1993, the sump was excavated and disposed of offbase.
- Building 755 was demolished in 2009, and the lot is currently vacant.

Remedial Action History

- A GET system, which consisted of two (2) dual phase extraction wells, was installed in the Building 755 source area and was operated from 2000 to 2008.
- A Phytoremediation study was initiated in August 1998 to assess the effectiveness of planted trees to hydraulically control and remove VOC contamination from groundwater.
- In November 2008 the GET system at Site DP039 was shut down for the installation of AFCEE demonstration project: an in situ bioreactor in the location of the former sump near Building 755.
- A technology demonstration of enhanced reductive dechlorination (ERD) treatment using an emulsified vegetable oil (EVO) permeable reactive barrier (PRB) was initiated in 2010.
- The Travis AFB Groundwater ROD selected bioreactor, phytoremediation, EVO PRB, and enhanced attenuation (EA) as the final remedy for Site DP039.

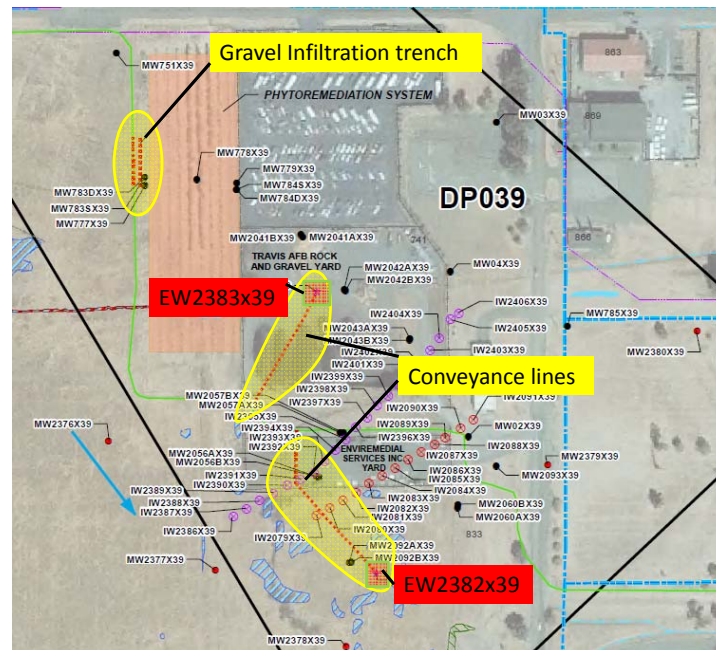
Remedial Action Approach

- The RA approach at Site DP039 is to optimize the existing phytoremediation and bioreactor components, and to supplement the existing EVO PRB in order to promote ERD throughout the portion of the Site DP039 groundwater plume where TCE concentrations exceed 500 µg/L.
- The RA approach for Site DP039 also included expansion of the EA monitoring network in the distal portion of the plume to support the design of an EA monitoring network.
- To implement and optimize the final remedy, 22 new injection wells, two (2) new extraction wells, and six (6) new monitoring wells were installed.



Remedial Action Implementation – Optimization of Phytoremediation System

- The phytoremediation system optimization included installing a gravel infiltration trench along the upgradient side of the phytoremediation system and two (2) solar-powered extraction wells in the downgradient portions of the plume where TCE concentrations exceed 500 µg/L.
- The optimization also included the installation of a new conveyance line which transports the extracted groundwater from EW2382x39 and EW2383x39 to the gravel and mulch filled infiltration trench for treatment by the phytoremediation system.



Infiltration Trench Installation

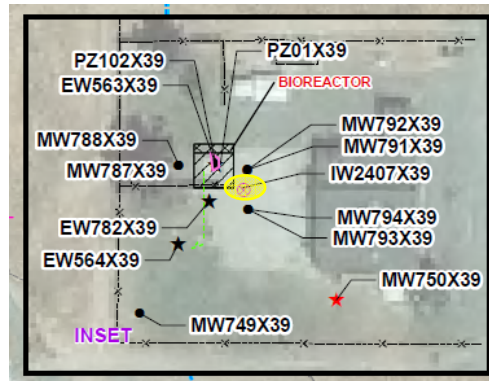
- An infiltration trench was installed along the upgradient western edge of the phytoremediation system.
- The infiltration trench was backfilled with 70/30 mixture of gravel and tree mulch to promote reductive dechlorination of VOCs and provide water and organic carbon to the root zone of the trees.
- Two (2) perforated PVC infiltration pipes were installed immediately above the gravel and mulch mixture and covered with a geotextile fabric.
- One (1) piezometer was installed at the southern end of the infiltration trench for the purpose of monitoring the water level within the infiltration trench.

Extraction Well Installation

- Two (2) new extraction wells (EW2382x39 and EW2383x39) were installed via hollow-stem auger in portions of the plume where TCE concentrations exceed 500 µg/L.
- To power the new extraction well pumps, a solar panel was installed within the southwest corner of the Travis AFB gravel and rock yard.

Remedial Action Implementation – Bioreactor Optimization

- The existing bioreactor was optimized by installing one (1) EVO injection well between the bioreactor and MW750x39, which is currently used as an extraction well to supply the bioreactor with groundwater.



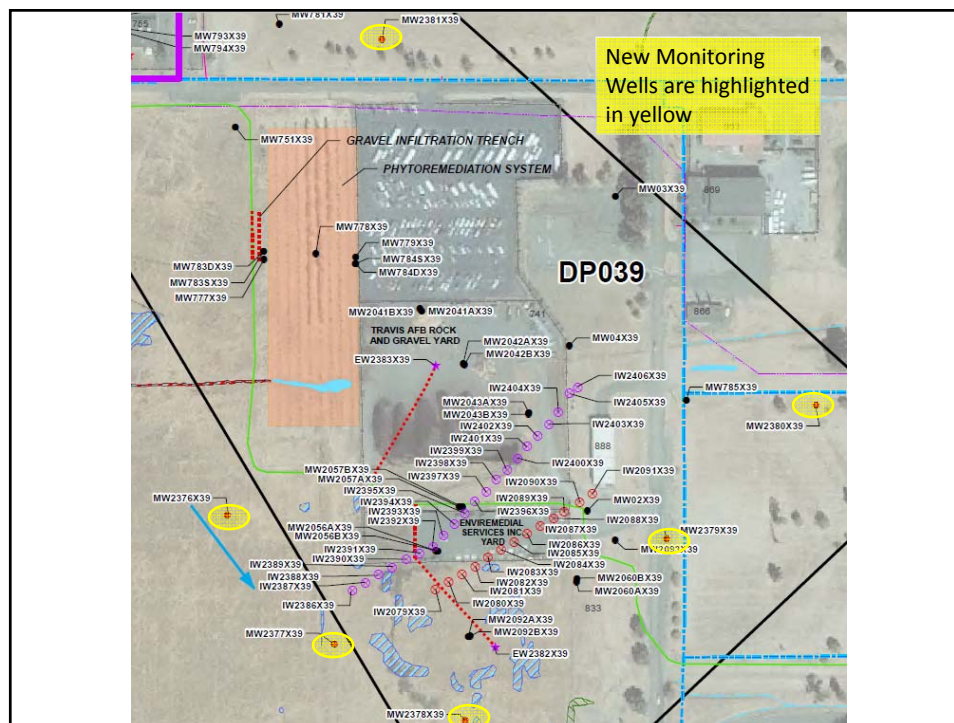
Remedial Action Implementation – EVO PRB Optimization

- In addition to the existing EVO PRB, a second EVO PRB was installed between the phytoremediation area and the existing EVO PRB.
- The second EVO PRB consists of 21 new injection wells installed in a line perpendicular to the groundwater flow direction, similar to the existing EVO PRB.
- The expanded injection well network fully implements ERD treatment within the 500- μ g/L TCE isocontour, consistent with the requirements of the Groundwater ROD.

- Each injection well was drilled to consolidated bedrock and installed as a single-completion 2-inch polyvinyl chloride (PVC) well with 15 to 30 feet of 0.020 prefabricated slot PVC screen spanning the lowest portion of the aquifer.
- The injection wells comprising the new EVO PRB were drilled with a well spacing of approximately 30 feet based on an estimated radius of influence (ROI) for EVO of 15 feet for each injection well.

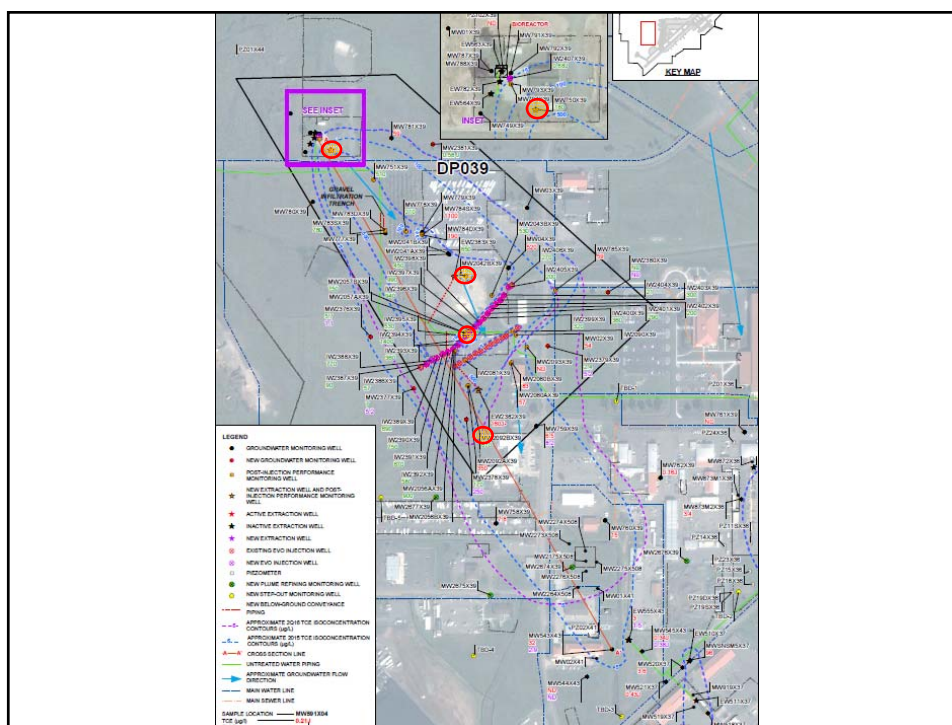
Remedial Action Implementation – Enhanced Attenuation

- To support the design of an EA monitoring network in the distal portion of the plume, six (6) new monitoring wells were installed crossgradient and downgradient of the plume.
- Baseline concentrations of TCE detected above the cleanup level at some of the new monitoring wells indicate that the extent of the Site DP039 TCE plume is not fully defined, and additional plume definition is needed prior to the establishment of an EA network.

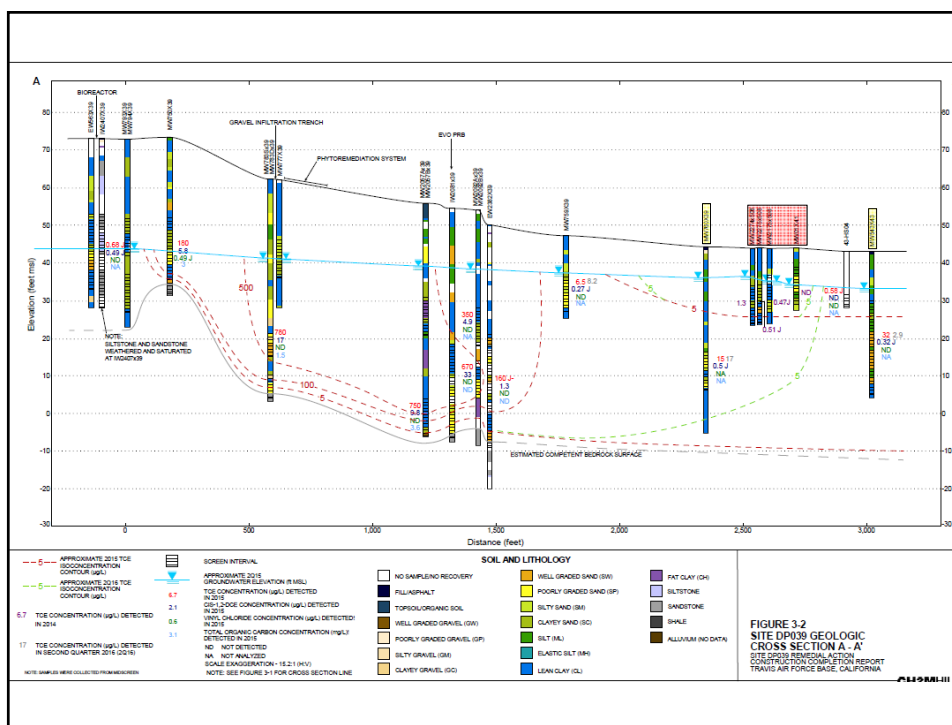
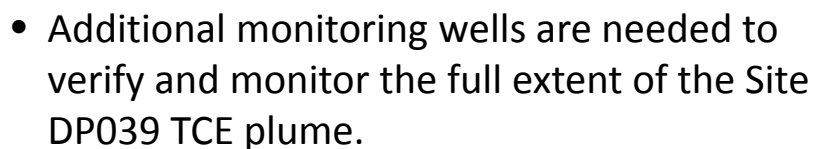


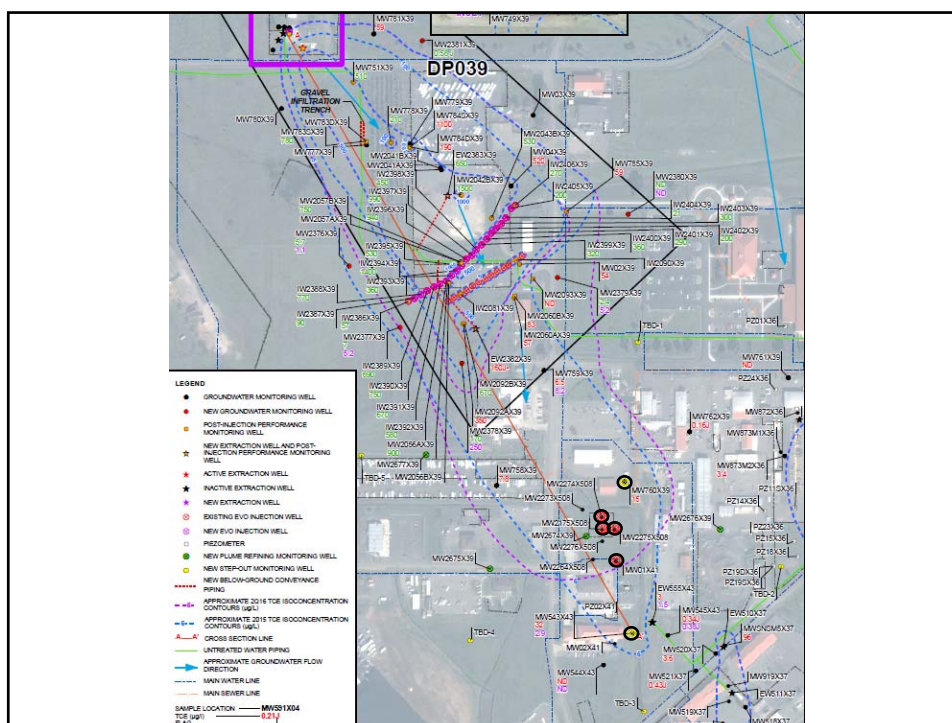
Baseline Groundwater Sampling

- **Bioreactor:** The maximum TCE concentration of 180 µg/L was detected at downgradient well MW750x39.
- **Phytoremediation System:** The maximum TCE concentration detected was 1,500 µg/L at MW2042Bx39, located approximately 200 feet downgradient of the phytoremediation system. New extraction wells EW2382x39 and EW2383x39 had baseline TCE concentrations of 160 J- and 650 µg/L, respectively.
- **EVO PRB:** TCE was detected in all EVO PRB wells with concentrations ranging from 21 to 1,400 µg/L. The maximum TCE concentration of 1,400 µg/L was detected at new injection well IW2394x39, located near the center of the new EVO PRB.
- **Enhanced Attenuation:** Along the western edge of the plume, TCE concentrations detected at wells MW2376x39 (5.7 µg/L) and MW2377x39 (7 µg/L) only slightly exceeded the cleanup level. However, the TCE concentration detected at new well MW2378x39, intended to define the southwestern extent of the plume, was 170 µg/L.



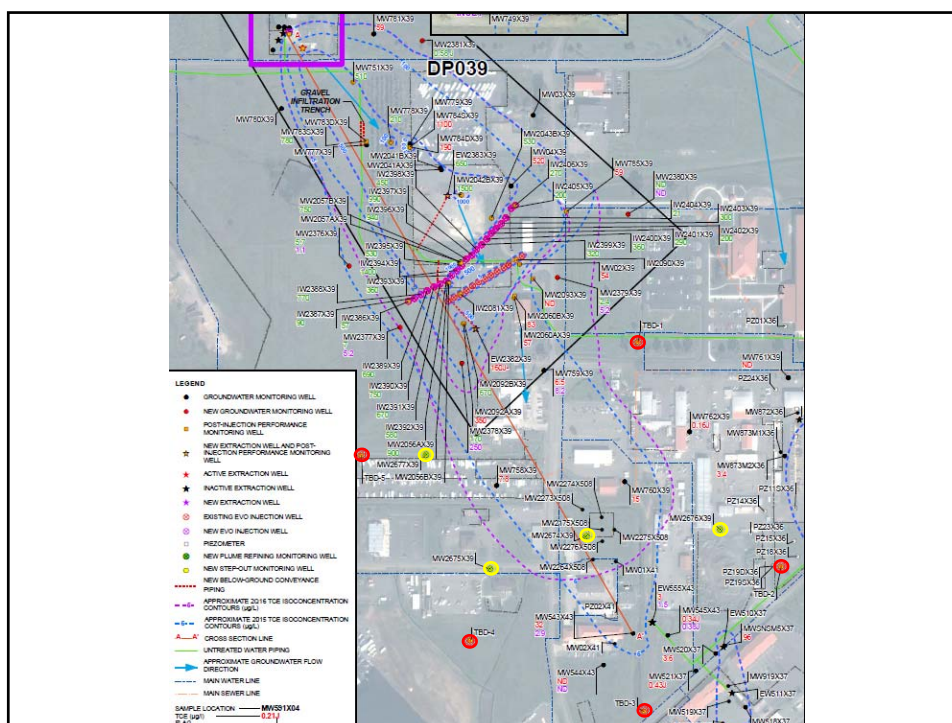
Enhanced Attenuation





Plume Refinement

- To support plume refinement, confirmation groundwater samples will be collected from MW2379x39 and MW543x43 and analyzed for VOCs.
- Four (4) new monitoring wells will be installed, developed and post-development groundwater sample will be collected and analyzed for VOCs.
- Because the TCE plume appears to dive below the shallow wells screened between 10 to 20 feet, the monitoring wells will be drilled to consolidated bedrock and screened across the highest permeability zones encountered below 30 feet bgs to ensure that the TCE plume is captured.
- If the groundwater sampling results exceed the cleanup level for TCE, up to five (5) step-out monitoring wells will be installed.



Plume Refinement

- Data from these additional wells will be used to support design of an appropriate EA monitoring network, which will be documented in a technical memorandum. The technical memorandum will also provide the following:
 - Methods used to carry out the monitoring well installation and baseline sampling
 - Final monitoring well construction details
 - The nature and extent of TCE contamination in groundwater that established baseline conditions at new monitoring well locations
 - Explanation regarding how the baseline sampling results were used to establish the EA network
 - The finalized EA monitoring network

Emulsified Vegetable Oil Injection

- Approximately 147,300 gallons of 3.7 percent EVO solution were injected into the 22 newly installed injection wells at Site DP039, followed by approximately 52,300 gallons of chase water.

Performance Monitoring

- Performance monitoring of the Site DP039 RA will be conducted semiannually for one (1) year and annually thereafter at eight (8) performance monitoring wells located near the new EVO injection sites and the new infiltration trench.
- The other 15 performance monitoring wells, two (2) new extraction wells, two (2) new injection wells, and two (2) existing injection wells will be sampled annually.
- The results of performance monitoring will be reported in the annual GRISRs.

Evaluation of Performance Monitoring Data

- **VOC** data will be used to evaluate the effectiveness of the treatment.
- **TOC** analysis will provide direct data on TOC concentrations within the treatment area.
- **Dissolved gas data** particularly methane, propane, butane and acetylene will be used to assess aerobic degradation and cometabolism in the aerobic/anaerobic groundwater transition area.
- **Geochemical parameters** will support evaluation of geochemical changes in the aquifer favorable to ERD.

Reporting

- Analytical results of the performance monitoring program and optimization opportunities for groundwater treatment at Site DP039 will continue to be presented in the annual GRISRs.
- The EA performance monitoring network will be presented in a technical memorandum, which will also document the confirmation groundwater sampling results and installation of the additional monitoring wells.

Questions?

Travis AFB Restoration Program

Program Update

*RPM Meeting
October 20, 2016*

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

3

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**

4

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

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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**

6

Completed Field Work (3)

- *SS016 Soil Data Gaps Investigation*
- *SD031 Remedial Investigation Soil Sampling (3rd round)*
- *Oil Water Separators Step-out Drilling*

7

Documents In-Progress

CERCLA

- *Community Involvement Plan*
- *Site DP039 RD/RA Construction Completion Report*
- Site FT005 Technology Demonstration Construction Completion Report
- Site TS060 Action Memorandum
- Site TS060 Removal Action Work Plan
- Site LF044 Investigation Work Plan
- 2015 Annual GRISR

8

Documents In-Progress

POCO

- Site FT004 POCO Soil Data Gap Investigation Work Plan
- ***Sites ST028 and ST032 POCO Well Decommissioning Work Plan***
- ***Site CG508 POCO Well Decommissioning and Site Closeout Technical Memorandum***

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Field Work In-Progress

CERCLA

- ***Multi-site Bioaugmentation & EVO Injection***
- ***SD034 Technology Demonstration Bioreactor Installation***
- ***Q4 2016 GRIP Sampling***

POCO

- ***OW040 Soil Excavation/Surface Restoration***
- ***OW057 Soil Excavation/Surface Restoration***
- ***Q4 2016 GRIP Sampling***

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Documents Planned

CERCLA

- ***SD033, SD043, SS046 Risk Assessment Tech Memo*** ***Dec***
- ***SD031 Remedial Investigation Report*** ***Jan***

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Documents Planned

POCO

- Sites OW051, OW053, and OW054 POCO
Evaluation/Closeout Report ***Dec***
- ***ST028 POCO Well Decommissioning/Site Closeout
Report*** ***Nov***
- ***SS014 POCO Completion Report*** ***Jan***

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Field Work Planned

CERCLA

- | | |
|------------------------|-----|
| • LF044 Berm Sampling | TBD |
| • TS060 Removal Action | TBD |

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

13

Field Work Planned

POCO

- | | |
|---|-----|
| • OW055 Close-in-place | Oct |
| • FT004 POCO Soil Data Gaps Investigation | TBD |

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

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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

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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 Memorandum¹⁶

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

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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

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