## Travis Air Force Base Environmental Restoration Program Restoration Program Manager's Meeting Minutes 19 April 2018, 1400 Hours

Mr. Lonnie Duke of the Air Force Civil Engineer Center (AFCEC) Restoration Installation Support Section (ISS) conducted the Restoration Program Manager's (RPM) meeting on 19 April at 1400 hours in Building 248 at Travis AFB, California. Attendees included:

Lonnie Duke	AFCEC/CZOW
Glenn Anderson	AFCEC/CZOW
Milton 'Gene' Clare	AFCEC/CZOW
Angel Santiago Jr.	AFCEC/CZOW
Monika O'Sullivan	AFCEC/CZOW
Haekyung Kim	AFCEC/CZRW
Kurt Grunawalt	60 AMW/JA
Dezso Linbrunner	USACE-Omaha
Sarah Miller	USACE-Omaha
Adriana Constantinescu	RWQCB
Ben Fries	DTSC
Nadia Hollan Burke	USEPA
Indira Balkissoon	Techlaw, Inc.
(via telephone)	
Tony Chakurian	CH2M JACOBS
Mike Wray	CH2M JACOBS

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

Attachment 1	Meeting Agenda
Attachment 2	Master Meeting and Document Schedule
Attachment 3	SBBGWTP Monthly Data Sheet (March 2018)
Attachment 4	CGWTP Monthly Data Sheet (March 2018)
Attachment 5	LF007C GWTP Monthly Data Sheet (March 2018)
Attachment 6	ST018 Monthly Data Sheet (March 2018)
Attachment 7	Presentation: Sites SD043 and SS046 Remedial Action/Remedial Design (RD/RA) Work Plans
Attachment 8	Presentation: Program Update (March 2018)

### 1. ADMINISTRATIVE

### A. Previous Meeting Minutes

The Draft Meeting Minutes were accepted as Final with no changes.

### B. Action Item Review

Action items from March 2018 were reviewed.

Action item 1 is ongoing: Ms. O'Sullivan to provide updates on perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA). 21 April 2018 update: Ms. O'Sullivan presented a figure showing the 17 areas of the base that were sampled. Groundwater and soil were sampled in 14 areas. PFOS/PFOA were detected in groundwater in all 14 of those areas, as well as the influent and effluent from the South Base Boundary Groundwater Treatment Plant. PFOS/PFOA were not detected in sediment samples. The review of the SI report is taking longer than expected. Comments on the SI will not be responded to or addressed with the next version of the SI, but instead will be incorporated into the RI Work Plan. Ms. O'Sullivan and Ms. Kim stressed that drinking water at the base has not been impacted; Mr. Duke added that for this reason, this site is not among the highest priority sites for the Air Force. Ms. Constantinescu noted that because her agency considers groundwater off-base as a drinking water source, she needs assurance that the PFOS/PFOA aren't migrating beyond the base boundary. Ms. Kim stated that additional sampling will be conducted. Ms. O'Sullivan requested that the Water Board document the request for additional sampling related to groundwater migration off-base in a letter, so that the request can be elevated appropriately.

Action Item 2 is ongoing: Mr. Duke will continue to provide design and construction information for the new KC-46 Hangar construction project for agency input ahead of the Air Force/Civil Engineering awarding the construction contract. April 2018 update: Mr. Duke stated that the design subcontractor will complete borings to help with horizontal well replacement in order to simplify contracting. They also plan on using the same passive barrier/venting design as the other 2-bay hangar at the base. Ms. Burke noted that the EPA will be providing comments on the horizontal boring, as well as the vapor intrusion pathway, indicating that data will be needed, and that the 2-bay hangar design may not be adequate. Ms. Constantinescu agreed with Ms. Burke's concerns related to the VI pathway and collection of additional vapor data, noting that there may still be VI risk once soil and groundwater are clean, and that the passive barrier proposed may not be adequate. Ms. Constantinescu mentioned the 2014 EPA's Memorandum that changed the decision-making process for TCE VI risk, as TCE now poses acute risk to pregnant women. Since it is acute risk, we must ensure that there is affectively no exposure of TCE to workers at the hangar. Ms. Constantinescu added that a different venting system might be in order depending on results of sampling;

additional soil gas sampling can be performed during the geotechnical investigation. Mr. Duke reminded the team that a barrier or venting system underneath the hangar bays is not possible, because the floor would not be strong enough; but that the bay doors would be open when work was being done. He added the passive venting/barrier will only be necessary in the offices, which will be in a building overlying tight clay soils, and upgradient of the plume. Mr. Duke stated that the 95% design will be complete soon, and he will find out more details about the planned VI barrier design. He requested that the agencies provide comments related to the VI barrier design and horizontal well as soon as possible in order to have their concerns adequately addressed in the final design.

Action Item 3: Mr. Santiago and Mr. Duke will check past TPH-G data for the CGWTP influent samples. April 2018 update: TPH-G is detected in influent samples sporadically at low concentrations, but there was no trend observed. Mr. Santiago and Mr. Duke will continue to monitor influent detections at this GWTP in future reports. This action item is closed.

Action Item 4: Mr. Duke will follow up on 1,4-dioxane detections in the Subarea LF007C GWTP effluent. April 2018 update: 1,4-dioxane is detected in effluent samples sporadically at low concentrations, but no trend has been observed. Mr. Santiago and Mr. Duke will continue to monitor effluent detections at this GWTP in future reports. This action item is closed.

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

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

### **Travis AFB Annual Meeting and Teleconference Schedule**

The next RPM meeting will be held on Wednesday 16 May 2018, at 0930 hours.

Reminder: The annual RAB tour (which historically has been held in October) will not be formally scheduled and will instead be individual tours given when an interested party would like to see field work. As a result, all agencies agreed to move the October RPM meeting from Thursday, October 18, to Wednesday, October 17, at 0930.

### **Travis AFB Master Document Schedule**

— Community Relations Plan Update (CRP): No change to the schedule. EPA and DTSC comments have been received; Water Board defers to EPA comments. This document is lower in priority than others so the schedule will likely change.

- Amendment to the WABOU Soil ROD for Travis AFB ERP Sites DP039, SD043, and SS046: No change in the schedule. The Air Force is working on responses to EPA comments.
- Amendment to the NEWIOU Soil ROD for the Travis AFB ERP Sites SS016 and SD033: The Draft to Agencies date was changed to 16 May 2018. The rest of the schedule was changed accordingly.
- Site SD031 Soil Remedial Investigation/Feasibility Study: The submittal date of the pre-draft version was changed to 25 May 2018; the rest of the schedule was changed accordingly.
- Site SD043 Remedial Design/Remedial Action Work Plan: The Draft to Agencies date was changed to 10 April 2018 based on the actual delivery date. The rest of the schedule was changed accordingly.
- Site SS046 Remedial Design/Remedial Action Work Plan: The Draft to Agencies date was changed to 12 April 2018. The rest of the schedule was changed accordingly.
- Site SS016 Remedial Design/Remedial Action Work Plan: This is a new schedule for this document; the intent is to expedite the field work upon finalization of the NEWIOU ROD amendment.
- Potrero Hills Annex (FS, PP, and ROD): No change was made to the schedule.
- Data Gap Investigation Results Technical Memorandum for Soil Site SS016: Response to comments due date changed to 23 April 2018. The rest of the schedule was changed accordingly.
- Site SS015 Soil Sampling Plan: The Draft to Agencies date was changed to 30 April 2018. The rest of the schedule was changed accordingly.
- Quarterly Newsletters (June 2018): This is a new schedule for the July 2018 issue.
- 2017 Annual GRISR: The pre-draft date was changed to 9 May 2018. The rest of the schedule was changed accordingly.
- Monitoring Well Installation Technical Memorandum for Site DP039, Addendum to the Site DP039 Remedial Action Construction Completion Report: Draft to Agencies date was changed to 19 April 2018 to reflect actual submittal date. The rest of the schedule was changed accordingly.
- Sites LF006, SS030, and SD031 Aquifer Test Activities Technical Memorandum: No changes were made to the schedule.
- Site FT005 Extraction System Optimization Report: The Draft to Agencies date was changed to 1 May 2018. The rest of the schedule was changed accordingly. The Air Force manager for this document was changed to Gene Clare.
- 2017 Annual CAMU Monitoring Report: No changes were made to the schedule.

- Emulsified Vegetable Oil Sites FT004, SS015, SD031, and SD036 Optimization Injections Report: No changes were made to the schedule.
- Site LF044 Sediment Sampling Report. The Predraft to the Air Force/Service Center date was changed to 12 April. The rest of the schedule was changed accordingly.
- POCO Evaluation/Closure Report for DERA-funded Oil/Water Separators OW040, OW047, OW048, OW049, OW052, OW050, OW052, OW055, OW056, and OW057: No changes were made to the schedule. Ms. Constantinescu noted that the first NFA letter that they will issue will combine OWSs OW051, OW053, and OW054. The remaining nine (9) OWSs have not been reviewed yet.
- Area of Concern TA500 Data Gap Investigation and Closure Report: The Response to Comment due date and the Final Due date were changed to 4 April to reflect actual submittal date. Ms. Constantinescu noted that the Water Board approves NFA for Site TA500.
- The following documents were moved to History:
  - Site TS060 Removal Action Completion Report
  - Site SS035 Site Closure Report

## 2. CURRENT PROJECTS

## **Treatment Plant Operation and Maintenance Update**

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

The South Base Boundary Groundwater Treatment Plant (SBBGWTP) performed at 99.7% uptime, and 6.2 million gallons of groundwater were extracted and treated in March 2018. All treated water was discharged to Union Creek. The average flow rate for the SBBGWTP was 145.4 gallons per minute (gpm). Electrical power usage was 20,247 kWh, and approximately 15,783 pounds of  $CO_2$  were created (based on DOE calculation). Approximately 0.87 pound of volatile organic compounds (VOCs) was removed in March. The total mass of VOCs removed since startup of the system is 499.0 pounds.

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

The SBBGWTP was temporarily shut down in March 2018 to backwash the lead GAC vessel. Troubleshooting and maintenance was performed on three wells at the SBBGWTP in March 2018.

## Central Groundwater Treatment Plant, March 2018 (see Attachment 4)

The Central Groundwater Treatment Plant (CGWTP) performed at 100% uptime with approximately 1,245,530 gallons of groundwater extracted and treated in March 2018. All treated water was discharged to the storm sewer system which discharges to Union Creek. The average flow rate for the CGWTP was 28.0 gpm. Electrical power usage was 2,673 kWh for all equipment connected to the Central Plant, and approximately 2,866 pounds of  $CO_2$  were generated. Approximately 2.69 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 11,486 pounds.

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

Two extraction wells were temporarily offline because the OSA vault was flooded. Rainwater was pumped out and the wells were restarted. Maintenance and upgrade activities included replacement of bag filters, installation of an emergency on/off button, and replacement of a damaged power supply for two extraction wells.

## LF007C Groundwater Treatment Plant, March 2018 (see Attachment 5)

The Subarea LF007C Groundwater Treatment Plant (LF007C GWTP) performed at 100% uptime with approximately 99,228 gallons of groundwater extracted and treated in March 2018. All treated water was discharged to the Duck Pond for beneficial reuse. The average flow rate was 4.4 gpm. Approximately 9.26 x  $10^{-4}$  pound of VOCs was removed from groundwater by the treatment plant in March. The total mass of VOCs removed since the startup of the system is 174.39 pounds. There was no electrical power usage statistics as this plant operates on solar power only.

Per agreement between the Air Force and agencies during the March RPM meeting, due to ongoing issues related to the recent TPH results for this treatment plant, the March 2018 sampling event for this treatment plant has been modified as follows:

- SVOCs were analyzed for influent and effluent samples
- Samples taken from extraction wells EW614x07, EW615x07, and monitoring well MW210x06, and were analyzed for TPH-D, TPH-G, TPH-MO, VOCs and SVOCs
- All TPH-D and TPH-MO samples were split between two laboratories for analysis for comparison purposes, to assist with determination of the source of the TPH recently noted in the effluent.

These results will help determine an appropriate sampling plan for this site going forward.

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

Note: The sump in the LF007C treatment compound is open to the atmosphere. Accumulated rain water must be pumped out by hand. This is done as part of the post-rain event inspections. An automatic pump has been installed to minimize down-time in the future.

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

Site ST018 (MTBE) Treatment Plant (ST018 GWTP) performed at 99.6% uptime with approximately 261,200 gallons of groundwater extracted and treated in March 2018. All treated water was discharged to the Fairfield – Suisun Sewer District. The average flow rate for the ST018 GWTP was 6.1 gpm. Electrical power usage for the month was 151 kWh for all equipment connected to the ST018 GWTP. The total CO<sub>2</sub> equivalent, including an estimate for the carbon change-out, equates to approximately 112 pounds. Approximately 1.11 pound of MTBE, BTEX, VOCs, and TPH was removed in January by the treatment plant, and approximately 0.12 pound of MTBE was removed from groundwater. The total BTEX, MTBE and TPH mass removed since the startup of the system is 44.6 pounds, and the total MTBE mass removed since startup of the system is 10.8 pounds.

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

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

## 3. Presentations:

# A) Sites SD043 and SS046 Remedial Design/Remedial Action (RD/RA) Work Plans (Attachment 7)

Mr. Tony Chakurian provided an overview of the upcoming work planned for Sites SD043 and SS046 this summer. Please refer to Attachment 7 for details. Additional points noted or clarified throughout the presentation include:

- The concrete pad at Site SD043 will not be replaced.
- Soil from 5 small areas will be excavated at Site SS046. There are borings between them with sampling results that indicate that the source of contamination is not contiguous.
- LUCs can be officially removed after the RACR is complete. This will be documented in the annual report, which will make it clear that there are no LUCs to inspect in these areas.

- The Site SD043 soil site can be closed after the remedial action, at which time the groundwater site can also be closed. There is no contamination in the groundwater, so there will be no groundwater LUCs,
- There is no impact to groundwater at Site SS046.

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

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

## 4. New Action Item Review

No new action items were identified.

## 5. PROGRAM/ISSUES/UPDATE

There are no additional program issues or updates at this time.

## 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 will continue to provide design and construction information for the KC-46 Hangar for agency input ahead of the Air Force/Civil Engineering awarding the construction contract.	Ongoing	Open

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

The RPM face-to-face meeting is scheduled for 02:00 PM PST on 19 April, 2018. **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

TREATMENT PLANT OPERATION AND MAINTENANCE UPDATE

### 3. PRESENTATIONS

- A SD043 RD/RA WORK PLAN
- B SS046 RD/RA WORK PLAN
- C PROGRAM UPDATE:

DOCUMENTS & ACTIVITIES COMPLETED, IN PROGRESS AND PLANNED

## 4. NEW ACTION ITEM REVIEW

### 5. PROGRAM/ISSUES/UPDATE

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.

## (2018) Annual Meeting and Teleconference Schedule

Monthly RPM Meeting <sup>1</sup>	RPM Teleconference	Restoration Advisory Board Meeting (Begins at 7:00 p.m.)
(Begins at time noted)	(Begins at time noted)	(Poster Session at 6:30 p.m.)
	01-17-18	
02-21-18	—	—
_	03-21-18	—
04-19-18 (Thursday 2:00 PM)	—	04-19-18
_	05-16-18	—
06-20-18	_	_
_	07-18-18	—
08-15-18	—	
_	09-19-18	
10-17-18	_	May through October <sup>2</sup>
_	11-21-18	_
_	_	_

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

<sup>2</sup> Note: Tentative RAB tour(s) during construction season.

PRIMARY DOCUMENTS				
	Community Relations Plan Update	Amendment to the WABOU Soil ROD for the Travis AFB ERP Sites DP039, SD043, and SS046	Amendment to the NEWIOU Soil ROD for the Travis AFB ERP Sites SS016 and SD033	Site SD031 Soil Remedial Investigation/Feasibility Study
	Travis AFB, Glenn Anderson	Travis AFB, Glenn Anderson	Travis AFB, Glenn Anderson	Travis AFB, Glenn Anderson
Life Cycle	CH2M, Jill Dunphy	CH2M, Latonya Coleman	CH2M, Latonya Coleman	CH2M, Nikki Carlton
Scoping Meeting	NA	NA	NA	NA
Predraft to AF/Service Center	08-23-16	10-09-17	02-28-18	05-25-18
AF/Service Center Comments Due	09-07-16	11-08-17	03-30-18	<mark>06-25-18</mark>
Draft to Agencies	09-28-16 (03-22-18)	11-30-17	<mark>05-16-18</mark>	07-23-18
Draft to RAB	09-28-16 (03-22-18)	11-30-17	<mark>05-16-18</mark>	07-23-18
Agency Comments Due	10-28-16 (04-27-18)	01-31-18	<mark>07-17-18</mark>	<mark>09-21-18</mark>
Response to Comments Meeting	05-16-18	02-21-18	<mark>07-18-18</mark>	<mark>10-17-18</mark>
Agency Concurrence with Remedy	NA	NA	NA	NA
Public Comment Period	NA	NA	NA	NA
Public Meeting	NA	NA	NA	NA
Response to Comments Due	06-07-18	04-27-18	08-02-18	<u>10-31-18</u>
Draft Final Due	06-07-18	04-27-18	08-02-18	<u>10-31-18</u>
Final Due	07-10-18	06-01-18	09-04-18	11-30-18

PRIMARY DOCUMENTS			
	Site SD043 Remedial	Site SS046 Remedial Design/Remedial Action Work Plan	Site SS016 Remedial Design/Remedial Action Work Plan
	Design/Remedial Action Work Plan	CH2M Doug Benwick	CH2M Doug Berwick
Life Cycle	CH2M, Levi Pratt	CAPE, Meg Greenwald	CAPE, Meg Greenwald
Scoping Meeting	NA	NA	NA
Predraft to AF/Service Center	02-22-18	03-02-18	05-07-18
AF/Service Center Comments Due	03-08-18	03-16-18	<mark>05-21-18</mark>
Draft to Agencies	<mark>04-10-18</mark>	04-12-18	<mark>06-08-18</mark>
Draft to RAB	<mark>04-10-18</mark>	04-12-18	<mark>06-08-18</mark>
Agency Comments Due	<mark>05-10-18</mark>	<mark>05-14-18</mark>	<mark>07-09-18</mark>
Response to Comments Meeting	05-16-18	05-16-18	<mark>07-18-18</mark>
Agency Concurrence with Remedy	NA	NA	NA
Public Comment Period	NA	NA	NA
Public Meeting	NA	NA	NA
Response to Comments Due	05-31-18	06-01-18	<mark>08-03-18</mark>
Draft Final Due	05-31-18	06-01-18	<mark>08-03-18</mark>
Final Due	07-02-18	07-03-18	<mark>09-05-18</mark>

PRIMARY DOCUMENTS				
	Potrero Hills Annex Travis, Glenn Anderson			
Life Cycle	FS	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	
<b>Response to Comments Meeting</b>	+ 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	

SECONDARY DOCUMENTS			
Life Cycle	Data Gap Investigation Results Technical Memorandum for Soil Site SS016 Travis AFB, Glenn Anderson CH2M, Doug Berwick CAPE, Meg Greenwald	Site SS015 Soil Sampling Plan Travis AFB, Glenn Anderson CH2M, Levi Pratt	
Scoping Meeting	NA	NA	
Predraft to AF/Service Center	10-04-17	03-13-18	
AF/Service Center Comments Due	10-18-17	03-27-18	
Draft to Agencies	11-30-17	<mark>04-30-18</mark>	
Draft to RAB	11-30-17	<mark>04-30-18</mark>	
Agency Comments Due	01-02-18	<mark>05-31-18</mark>	
Response to Comments Meeting	01-17-18	<mark>06-20-18</mark>	
Response to Comments Due	03-21-18 (04-23-18)	<mark>07-16-18</mark>	
Draft Final Due	NA	NA	
Final Due	03-21-18 (04-23-18)	<mark>07-16-18</mark>	
Public Comment Period	NA	NA	
Public Meeting	NA	NA	

INFORMATIONAL DOCUMENTS			
Quarterly Newsletter     2017 Annual GRISR       (July 2018)     Travis AFB, Glenn Anders       Life Cycle     Travis, Glenn Anderson			
Scoping Meeting	NA	NA	
Predraft to AF/Service Center	06-26-18	<mark>05-09-18</mark>	
AF/Service Center Comments Due	NA	<mark>06-11-18</mark>	
Draft to Agencies	07-03-18	<mark>07-13-18</mark>	
Draft to RAB	NA	<mark>07-13-18</mark>	
Agency Comments Due	07-17-18	<mark>08-13-18</mark>	
Response to Comments Meeting	<mark>07-18-18</mark>	<mark>08-22-18</mark>	
Response to Comments Due	07-19-18	<mark>09-12-18</mark>	
Draft Final Due	NA	NA	
Final Due	07-19-18	<mark>09-12-18</mark>	
Public Comment Period	NA	NA	
Public Meeting	NA	NA	

INFORMATIONAL DOCUMENTS			
	Monitoring Well Installation Technical Memorandum for Site DP039, Addendum to the Site DP039 Remedial Action Construction Completion Report Travis AFB, Glenn Anderson	Sites LF006, SS030 and SD031 Aquifer Test Activities Technical Memorandum Travis AFB, Glenn Anderson	Site FT005 Extraction System Optimization Technical Memorandum Travis AFB, Gene Clare
Life Cycle	CH2M, Levi Pratt	CH2M, Renee Caird	CH2M, Levi Pratt
Scoping Meeting	NA	NA	NA
Predraft to AF/Service Center	02-26-18	02-15-18	03-08-18
AF/Service Center Comments Due	03-14-18	03-02-18	03-22-18
Draft to Agencies	04-19-18	03-21-18	<mark>05-01-18</mark>
Draft to RAB	04-19-18	03-21-18	05-01-18
Agency Comments Due	05-21-18	04-23-18	<mark>06-01-18</mark>
Response to Comments Meeting	<mark>06-20-18</mark>	05-16-18	<mark>06-20-18</mark>
Response to Comments Due	07-27-18	06-04-18	07-18-18
Draft Final Due	NA	NA	NA
Final Due	07-27-18	06-04-18	07-18-18
Public Comment Period	NA	NA	NA
Public Meeting	NA	NA	NA

Life Cycle	2017 Annual CAMU Monitoring Report Travis AFB, Gene Clare CH2M HILL, Levi Pratt	Emulsified Vegetable Oil Sites FT004, SS015, SD031, and SD036 Optimization Injections Technical Memorandum Travis AFB, Glenn Anderson CH2M, Levi Pratt	Site LF044 Sediment Sampling Technical Memorandum Travis AFB, Glenn Anderson CH2M, Doug Berwick CAPE, Meg Greenwald
Scoping Meeting	NA	NA	NA
Predraft to AF/Service Center	04-19-18	05-22-18	<mark>04-12-18</mark>
AF/Service Center Comments Due	05-03-18	06-06-18	<mark>04-26-08</mark>
Draft to Agencies	05-18-18	06-25-18	<mark>05-11-18</mark>
Draft to RAB	05-18-18	06-25-18	<mark>05-11-18</mark>
Agency Comments Due	06-18-18	07-26-18	<mark>06-11-18</mark>
Response to Comments Meeting	07-11-18	08-15-18	06-20-18
Response to Comments Due	07-25-18	08-31-18	07-13-18
Draft Final Due	NA	NA	NA
Final Due	07-25-18	08-31-18	07-13-18
Public Comment Period	NA	NA	NA
Public Meeting	NA	NA	NA

INFORMATIONAL POCO DOCUMENTS			
POCO Evaluation/Closure Report for DERA-funded Oil/Water Separators OW040, OW047, OW048, OW049, OW050, OW052, OW055, OW056, and OW057 Travis AEB, Glenn Anderson		Area of Concern TA500 Data Gap Investigation and Closure Report Travis AFB, Glenn Anderson	
Life Cycle	CH2M, Doug Berwick	CH2M, Renee Caird	
Scoping Meeting	NA	NA	
Predraft to AF/Service Center	02-01-17	12-21-17	
AF/Service Center Comments Due	02-15-17	01-08-18	
Draft to Agencies	12-19-17	01-23-18	
Draft to RAB	12-19-17	01-23-18	
Agency Comments Due	01-30-18	02-23-18 (03-16-18)	
Response to Comments Meeting	02-21-18	03-09-18	
Response to Comments Due	03-07-18 (04-17-18)	03-27-18 <mark>(04-04-18)</mark>	
Draft Final Due	NA	NA	
Final Due	03-07-18 (04-17-18)	03-27-18 <mark>(04-04-18)</mark>	
Public Comment Period	NA	NA	
Public Meeting	NA	NA	

## Travis AFB Master Meeting and Document Schedule

HISTORY					
	Site TS060 Removal Action Completion Report				
	Travis AFB, Glenn Anderson	Site SS035 Site Closure Report			
	CH2M, Doug Berwick	Travis AFB, Glenn Anderson			
Life Cycle	CAPE, Meg Greenwald	CH2M, Leslie Royer			
Scoping Meeting	NA	NA			
Predraft to AF/Service Center	11-08-17	11-07-17			
AF/Service Center Comments Due	11-22-17	11-21-17			
Draft to Agencies	12-11-17	12-21-17			
Draft to RAB	12-11-17	12-21-17			
Agency Comments Due	01-15-18	01-25-18			
Response to Comments Meeting	01-17-18	02-21-18			
Response to Comments Due	03-05-18	03-14-18			
Draft Final Due	NA	NA			
Final Due	03-05-18	03-14-18			
Public Comment Period	NA	NA			
Public Meeting	NA	NA			

# South Base Boundary Groundwater Treatment Plant Monthly Data Sheet

### Report Number: 209Reporting Period: 28 February 2018 – 30 March 2018

Date Submitted: 13 April 2018

This monthly data sheet presents information regarding the South Base Boundary Groundwater Treatment Plant (SBBGWTP) and associated remedial process optimization (RPO) activities.

## **System Metrics**

Table 1 presents operational data from the March 2018 reporting period.

Table 1 – Operations Summary – March 2018						
Initial Data Collec	tion:	2/28/2018 14:20		Final Data Col	lection:	3/30/2018 12:00
Operating Time:		Percent Uptime:		Electrical Powe	er Usage:	
SBBGWTP:	716 hours	SBBGWTP:	99.7%	SBBGWTP:	20,247 kWh (	15,783 lbs CO2 generated <sup>a</sup> )
Gallons Treated: 6.2 million gallons				Gallons Treated Since July 1998: 1,028 million gallons		
Volume Discharged to Union Creek: 6.2 million gallons			IS	Gallons Treated From Other Sources: 0 gallons		
VOC Mass Removed: 0.87 Ibs <sup>b</sup>				VOC Mass Removed Since July 1998: 499.0 lbs		
Rolling 12-Month (	Cost per Pound of	Mass Removed <sup>:</sup> \$	9,586 <sup>c</sup>			
Monthly Cost per F	ound of Mass Re	emoved: \$16,980 <sup>c</sup>				
Ibs = pounds <sup>a</sup> SiteWise <sup>™</sup> estimate that 1 kilowatt hour generated produces 0.74 pounds of GHG. Value also includes approximately 800 pounds of GHG from GAC change out services averaged to a per month basis. <sup>b</sup> Calculated using March 2018 EPA Method SW8260C analytical results. <sup>c</sup> 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) <sup>a</sup> – March 2018							
FT005 <sup>b</sup>				SS	029	SS03	30
EW01x05	Offline	EW743x05	Offline	EW01x29	Offline <sup>c</sup>	EW01x30	12.9
EW02x05	Offline	EW744x05	3.9	EW02x29	Offline <sup>c</sup>	EW02x30	0.0 <sup>d</sup>
EW03x05	Offline	EW745x05	11.4	EW03x29	2.9	EW03x30	15.6
EW731x05	6.2	EW746x05	Offline	EW04x29	5.3	EW04x30	23.6
EW732x05	Offline	EW2291x05	5.2	EW05x29	5.8	EW05x30	15.1
EW733x05	Offline	EW2782x05	Offline <sup>e</sup>	EW06x29	5.6	EW2174x30	9.0
EW734x05	4.6	EW2783x05	8.1	EW07x29	12.2	EW711x30	0.0 <sup>d</sup>
EW735x05	12.2	EW2784x05	8.3		 		
EW736x05	Offline	EW2785x05	6.2		 		
EW737x05	Offline	EW2786x05	17.2		 		
EW742x05	Offline				 		
	FT005 Tc	otal: 83.3		SS029 Tota	al: 31.8	SS030 Total	: 76.2
SBBGWTP Ave	SBBGWTP Average Monthly Flow <sup>f</sup> : 145.4 gpm						
<ul> <li><sup>a</sup> Flow rates pres</li> <li><sup>b</sup> Most extraction Central Groundy</li> </ul>	<ul> <li><sup>a</sup> Flow rates presented are instantaneous measurements taken at the end of the reporting period.</li> <li><sup>b</sup> Most extraction wells at FT005 were taken offline in accordance with the 2008 Annual Remedial Process Optimization Report for the Central Groundwater Treatment Plant, North Groundwater Treatment Plant, and South Base Boundary Groundwater Treatment Plant.</li> </ul>						
<sup>c</sup> Extraction wells taken off line because of persistent fouling of the well pumps and associated discharge piping.							

<sup>d</sup> Extraction well was operational but water levels were recharging field readings were collected.

Extraction well was off line because of low flow alarm.

<sup>f</sup> The average SBBGWTP groundwater flow rate was calculated using the Union Creek Discharge Totalizer and dividing it by the total time the system was operational.

gpm – gallons per minute

SBBGWTP – South Base Boundary Groundwater Treatment Plant

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

## Table 3 – Summary of System Shutdowns

	Shutdown <sup>a</sup>		Restart <sup>a</sup>		
Location	Date	Time	Date	Time	Cause
SBBGWTP	19 March 2018	09:00	19 March 2018	10:30	Backwashed lead GAC vessel

-- = Time not recorded

<sup>a</sup> Shutdown and restart times estimated based on field notes

SBBGWTP = South Base Boundary Groundwater Treatment Plant

## Summary of O&M Activities

Monthly groundwater treatment samples were collected at the SBBGWTP on 7 March 2018. Sample results are presented in Table 4. The total VOC concentration (16.80  $\mu$ g/L) in the influent sample has slightly increased from the February 2018 sample results (15.13  $\mu$ g/L). TCE was the primary VOC detected in the influent sample at a concentration of 15.1  $\mu$ g/L. Several VOCs were detected in the midpoint sampling location, including 1,2-DCA, cis-1,2-DCE, and chloroform. No VOCs were detected at the effluent sampling location. The overall decrease in the total VOC influent concentration is a result of the five (5) new Site FT005 extraction wells pumping groundwater with lower TCE concentrations but higher 1,2-DCA concentrations. Figure 1 presents the 1,2-DCA and TCE concentrations since January 2017.

The SBBGWTP was temporarily shut down in March 2018 for approximately 2 hours to backwash the lead GAC vessel

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

- EW07x29 Replaced the pump motor. Well is currently operating.
- EW04x30 The transducer wires need to be replaced. Well is currently operating.
- EW2783x05 Repaired a leak on the union valve that was causing the pump to cycle. Well is currently operating.

Figure 2 presents a plot of influent concentrations and average flow at the SBBGWTP over the past twelve (12) months. The VOC influent concentrations have generally been fluctuating over the past 12 months with an overall decreasing trend. However, an overall increasing flow rate trend was observed in the past 12 months with the addition of the new extraction wells at Site FT005.

## **Optimization Activities**

No optimization activities occurred at the SBBGWTP in March 2018.

## Sustainability

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

Figure 3 presents the historical GHG production from the SBBGWTP. In March 2018, the SBBGWTP produced approximately 15,783 pounds of GHG, which includes approximately 800 pounds of GHG generated from GAC change out services averaged to a per month basis.

#### TABLE 4

Summary of Groundwater Analytical Data for March 2018 – South Base Boundary Groundwater Treatment Plant

	Instantaneous Maximum*	Detection			7 March 2018 (μg/L)	
Constituent	(μg/L)	(μg/L)	N/C	Influent	Midpoint	Effluent
Halogenated Volatile Organics						
Acetone	NA	1.0	0	ND	ND	ND
Bromodichloromethane	NA	0.15	0	ND	ND	ND
Carbon Tetrachloride	0.5	0.15	0	ND	ND	ND
Chloroform	5.0	0.15	0	0.18 J	0.36 J	ND
Chloromethane	NA	0.15	0	ND	ND	ND
1,1-Dichloroethane	5.0	0.15	0	ND	ND	ND
1,2-Dichloroethane	0.5	0.15	0	0.56	0.80	ND
1,1-Dichloroethene	5.0	0.15	0	ND	ND	ND
cis-1,2-Dichloroethene	5.0	0.15	0	0.96	1.17	ND
trans-1,2-Dichloroethene	5.0	0.15	0	ND	ND	ND
Methylene Chloride	5.0	0.15	0	ND	ND	ND
Tetrachloroethene	5.0	0.15	0	ND	ND	ND
1,1,1-Trichloroethane	5.0	0.15	0	ND	ND	ND
1,1,2-Trichloroethane	5.0	0.15	0	ND	ND	ND
Trichloroethene	5.0	0.15	0	15.1	ND	ND
Vinyl Chloride	0.5	0.15	0	ND	ND	ND
Non-Halogenated Volatile Organi	cs					
Benzene	1.0	0.15	0	ND	ND	ND
Ethylbenzene	5.0	0.15	0	ND	ND	ND
Toluene	5.0	0.15	0	ND	ND	ND
Xylenes	5.0	0.15 – 0.30	0	ND	ND	ND
Other						
Total Petroleum	50	35	0	ND	NM	ND
Hydrocarbons – Gasoline						
Total Petroleum	50	24	0	ND	NM	ND
Hydrocarbons – Diesel			_			
Total Petroleum Hydrocarbons – Motor Oil	50	24	0	ND	NM	ND
1,4-Dioxane	NA	0.19	0	NM	NM	ND

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

Notes:

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

mg/L = milligrams per liter

NA = not applicable

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

ND = not detected

NM = not measured

 $\mu$ g/L = micrograms per liter







South Base Boundary Groundwater Treatment Plant Monthly Data Sheet SBBGWTP\_March2018.docx

# Central Groundwater Treatment Plant Monthly Data Sheet

### Report Number: 224 Reporting Period: 27 February 2018 – 30 March 2018

Date Submitted: 13 April 2018

This monthly data sheet presents information regarding the Central Groundwater Treatment Plant (CGWTP) and its associated technology demonstrations. The ongoing technology demonstrations related to the CGWTP include various emulsified vegetable oil (EVO) injections and two (2) bioreactor treatability studies.

## System Metrics

Table 1 presents operational data from the March 2018 reporting period.

Table 1 – Operations Summary – March 2018						
Initial Data Collect	ion: 2/27/2018 12:10	)	Final Data Collection:	3/30/2	2018 10:20	
Operating Time:		Percent Up	time:	Electrical Pov	ver Usage:	
CGWTP:	742 hours	CGWTP:	100%	CGWTP:	2,673 kWh (2,866 lbs CO <sub>2</sub> generated <sup>a</sup> )	
Gallons Treated (dis 1,245,530 gallons	d (discharge to storm sewer): Gallons Treated Since January 1996: <b>553.9 million gallons</b>					
VOC Mass Remove	ved from groundwater: VOC Mass Removed Since January 1996:					
<b>2.69 lbs</b> <sup>b</sup>		2,800 lbs from groundwater				
			8,686 lbs from vapor			
Rolling 12-Month Co	ost per Pound of Mass Remove	ed <sup>:</sup> \$2,246 <sup>c</sup>				
Monthly Cost per Po	Monthly Cost per Pound of Mass Removed: \$2,561°					
<sup>a</sup> SiteWise <sup>™</sup> estimate from GAC change ou <sup>b</sup> Calculated using Ma <sup>c</sup> Costs include opera system.	e that 1 kilowatt hour generated p It services averaged to a per mo arch 2018 EPA Method SW8260 tions and maintenance, reporting	produces 0.74 nth basis. )C analytical n g, analytical la	pounds of GHG. Value also in esults. boratory, project management	cludes approxim	nately 888 pounds of GHG s related to operation of the	

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

Table 2 – CGWTP Average Flow Rates <sup>a</sup> – March 2018					
Location	Average Flow Rate Groundwater (gpm)				
EW001x16	13.2				
EW002x16	11.0				
EW003x16	0.2				
EW605x16	4.7				
EW610x16	1.9				
CGWTP	28.0				
<ul> <li><sup>a</sup> Flow rates calculated by dividing tota instantaneous readings.</li> <li>gpm = gallons per minute</li> </ul>	al gallons processed by system operating time for the month or the average of the				

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

Table 3 – Summary of System Shutdowns						
	Shutdown <sup>a</sup>		Restart			
Location	Date	Time	Date	Time	Cause	
CGWTP	None.				None.	
= Date/Tin	= Date/Time not recorded					
<sup>a</sup> Shutdown and restart times estimated based on field notes						
CGWTP = 0	Central Groundwater Trea	itment Plan	t			

Table 4 presents a twelve-month summary of the Site DP039 bioreactor recirculation well pulsing dates.

Table 4 – Summary of DP039 Bioreactor "Pulsed Mode" Operations					
Location	Pulse-on Date	Pulse-off Date			
	5 April 2017	7 August 2017			
	7 September 2017	2 October 2017			
	6 November 2017	27 November 2017			
MW750x39	26 December 2017	22 January 2018			
	19 February 2018	21 March 2018			
MW = Monitoring V	Vell				

## Summary of O&M Activities

Monthly groundwater treatment samples were collected at the CGWTP on 6 March 2018. Sample results are presented in Table 5. The total VOC concentration (259.51  $\mu$ g/L) in the March 2018 influent sample has increased from the February 2018 sample (205.91  $\mu$ g/L). TCE was the primary VOC detected in the influent sample at a concentration of 211  $\mu$ g/L. Cis-1,2-DCE (19.2  $\mu$ g/L), vinyl chloride (0.29 J  $\mu$ g/L), and MTBE (0.15 J  $\mu$ g/L) were detected in the sample collected after the first carbon vessel, and vinyl chloride (0.22 J  $\mu$ g/L) was detected in the sample collected after the second carbon vessel. No VOC constituents were detected in the effluent sample. Acetone was also detected in the sample after the second carbon vessel; however, acetone is a common laboratory contaminant and not likely a chemical of concern. Travis AFB will continue to monitor influent, midpoint, and effluent concentrations at the CGWTP for carbon breakthrough, though the carbon treatment remained effective in March 2018. A carbon change out on the lead GAC vessel is being coordinated.

Figure 1 presents a plot of influent concentrations (total VOCs) and the influent flow rate at the CGWTP versus time for the past twelve (12) months. The influent concentrations show a decreasing trend over the past 12 months along with an overall slightly decreasing trend for the flow rate through the treatment plant. The reduction in flow rate is likely a seasonal fluctuation.

The two (2) OSA extraction wells, EW605x16 and EW610x16, were off line for several days because the OSA vault was flooded from the recent rain events. The rainwater in the vault was pumped out, and the wells were restarted.

There were several maintenance and upgrade activities performed at the CGWTP in March 2018 as follows:

- Replaced the bag filters;
- Installed an emergency shutoff/stop button; and
- Replaced a damaged 24-volt power supply for EW605x16 and EW610x16.

The Site DP039 subgrade biogeochemical reactor (SBGR), also known as a bioreactor, continued to operate in a four-week "pulsed mode" to optimize distribution of total organic carbon (TOC). The bioreactor was taken off line on 21 March as planned.

## **Optimization Activities**

No optimization activities occurred at the CGWTP in March 2018.

## Sustainability

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

Figure 2 presents the historical GHG production from the systems associated with the CGWTP. The CGWTP produced approximately 2,866 pounds of GHG during March 2018.

#### TABLE 5

Summary of Groundwater Analytical Data for March 2018 - Central Groundwater Treatment Plant

				6 March 2018 (μg/L)			
Constituent	Instantaneous Maximum* (μg/L)	Detection Limit (µg/L)	N/C	Influent	After Carbon 1 Effluent	After Carbon 2 Effluent	System Effluent
Halogenated Volatile Organics							
Acetone	NA	1.0	0	ND	ND	0.68 J	ND
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	43.3	19.2	ND	ND
1,2-Dichlorobenzene	5.0	0.15	0	0.40 J	ND	ND	ND
1,3-Dichlorobenzene	5.0	0.15	0	0.42 J	ND	ND	ND
1,4-Dichlorobenzene	5.0	0.15	0	0.23 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	0.60	ND	ND	ND
Methylene Chloride	5.0	0.15	0	ND	ND	ND	ND
Methyl tert-Butyl Ether	1.0	0.15	0	ND	0.15 J	ND	ND
Tetrachloroethene	5.0	0.15	0	0.57	ND	ND	ND
1,1,1-Trichloroethane	5.0	0.15	0	ND	ND	ND	ND
1,1,2-Trichloroethane	5.0	0.15	0	ND	ND	ND	ND
trans-1,2-Dichloroethene	5.0	0.15	0	2.68	ND	ND	ND
Trichloroethene	5.0	0.15 – 1.5	0	211	ND	ND	ND
Vinyl Chloride	0.5	0.15	0	0.31 J	0.29 J	0.22 J	ND
Non-Halogenated Volatile Orga	anics						
Benzene	1.0	0.15	0	ND	ND	ND	ND
Ethylbenzene	5.0	0.15	0	ND	ND	ND	ND
Toluene	5.0	0.15	0	ND	ND	ND	ND
Total Xylenes	5.0	0.15 – 0.30	0	ND	ND	ND	ND
Other							
Total Petroleum Hydrocarbons – Gasoline	50	35	0	87.3 J	NM	NM	ND
Total Petroleum Hydrocarbons – Diesel	50	24	0	ND	NM	NM	ND
Total Petroleum Hydrocarbons – Motor Oil	50 (trigger)	24	0	ND	NM	NM	ND
1,4-Dioxane	NA	0.19	0	NM	NM	NM	ND

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

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  $\mu g/L = micrograms per liter$ mg/L = milligrams per liter

Notes:





# Subarea LF007C Groundwater Treatment Plant Monthly Data Sheet

### Report Number: 168Reporting Period: 28 February 2018 – 16 March 2018Date Submitted: 13 April 2018

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

## System Metrics

Table 1 presents operational data from the March 2018 reporting period:

Table 1 – Operations Summary – March 2018						
Initial Data Collection:	2/28/2018 14:00	Final Data Collection:3/16/2018 09:30				
Operating Time:	Percent Uptime:	Electrical Power Usage <sup>a</sup> :				
LF007C GWTP: 378 hours	LF007C GWTP 100% <sup>b</sup>	LF007C GWTP: 0 kWh				
Gallons Treated: <b>99,228 gallons</b>	• 99 228 gallons	Gallons Treated Since March 2000: 87.3 million gallons				
VOC Mass Removed: 9.26 x 10 <sup>-4</sup> pounds <sup>c</sup>		VOC Mass Removed Since March 2000: <b>174.39 pounds</b> (Groundwater)				
Rolling 12-Month Cost per Pound	of Mass Removed: <b>Not Measured</b> <sup>d</sup>					
Monthly Cost per Pound of Mass Removed: Not Measured <sup>d</sup>						
<ul> <li><sup>a</sup> The LF007C GWTP operates on solar power only.</li> <li><sup>b</sup> The system was operational 100% of the available time between 28 February and 16 March (when the system was taken off line due to vernal pool formation).</li> <li><sup>c</sup> VOCs from March 2018 influent sample detected by EPA Method SW8260C.</li> <li><sup>d</sup> Value not calculated since measurement does not accurately represent the cost effectiveness of the system.</li> </ul>						

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

Table 2 – LF007C GWTP Average and Total Flow Rates – March 2018						
Location	Average Flow Rate (gpm) <sup>a</sup>	Total Gallons Processed (gallons)				
EW614x07	3.9	88,873				
EW615x07	0.4	9,287				
LF007C GWTP	4.4	99,228				
<sup>a</sup> 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										
	Shutdown <sup>a</sup>		Restart <sup>a</sup>							
Location	Date	Time	Date	Time	Cause					
LF007C GWTP	16 March 2018	09:30			LF007C GWTP was shut down because vernal pools had formed at Subarea LF007C.					
= Time not recorded										
<sup>a</sup> Shutdown and restart times estimated based on field notes LF007C GWTP = Subarea LF007C Groundwater Treatment Plant										

## Summary of O&M Activities

Monthly groundwater samples were collected at the LF007C GWTP on 7 March 2018. Sample results are presented in Table 4. TCE (1.12  $\mu$ g/L) was detected at the influent sample location. In addition, TPH-d (61  $\mu$ g/L) was detected at the influent sample location. Cis-1,2-DCE was detected at a trace concentration at the midpoint sampling location. No VOC contaminants were detected at the effluent sampling location. However, the effluent sample identified TPH-d at a concentration (43.0 J  $\mu$ g/L), which is less than the effluent limitation of 50  $\mu$ g/L. In addition, 1,4-dioxane was detected in the effluent sample at a concentration of 0.58 J  $\mu$ g/L. There are no established effluent limits for 1,4-dioxane when discharging to non-drinking water receiving waters according to the current VOC and fuel general NPDES permit. No SVOCs were detected from the LF007C GWTP influent and effluent samples.

As per the February 2018 Triad discussions with EPA, Water Board, and DTSC, several revisions were recommended for the March 2018 monthly sampling event. Samples from EW614x07, EW615x07, and MW210x06 were collected and analyzed for TPH-g, TPH-d, TPH-mo, VOCs, and SVOCs in March 2018. These sample results are presented in Table 5. TPH-d was detected in all three (3) wells, and TPH-mo was only detected in EW615x07. No TPH-g, BTEX, or SVOCs were detected in any of the samples.

The March 2018 sample results will be further evaluated and discussed during future Triad meetings to help determine an appropriate monthly sampling plan for the LF007C GWTP.

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

## **Optimization Activities**

No optimization activities occurred at the LF007C GWTP in March 2018.

## Sustainability

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

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

#### TABLE 4

Summary of Groundwater Analytical Data for March 2018 – Subarea LF007C Groundwater Treatment Plant

	Instantaneous Maximum*	Detection		6 March 2018 (μg/L)		
Constituent	(μg/L)	(μg/L)	N/C	Influent	After Carbon 1	Effluent
Halogenated Volatile Organics						
Acetone	NA	0.50	0	ND	ND	ND
Bromodichloromethane	5.0	0.15	0	ND	ND	ND
Bromoform	5.0	0.15	0	ND	ND	ND
2-Butanone	5.0	2.0	0	ND	ND	ND
Carbon Tetrachloride	0.5	0.15	0	ND	ND	ND
Chloroform	5.0	0.15	0	ND	ND	ND
Dibromochloromethane	5.0	0.15	0	ND	ND	ND
1,3-Dichlorobenzene	5.0	0.15	0	ND	ND	ND
1,4-Dichlorobenzene	5.0	0.15	0	ND	ND	ND
1,1-Dichloroethane	5.0	0.15	0	ND	ND	ND
1,2-Dichloroethane	0.5	0.15	0	ND	ND	ND
1,1-Dichloroethene	5.0	0.15	0	ND	ND	ND
cis-1,2-Dichloroethene	5.0	0.15	0	ND	0.17 J	ND
trans-1,2-Dichloroethene	5.0	0.15	0	ND	ND	ND
Methylene Chloride	5.0	0.15	0	ND	ND	ND
Tetrachloroethene	5.0	0.15	0	ND	ND	ND
1,1,1-Trichloroethane	5.0	0.15	0	ND	ND	ND
1,1,2-Trichloroethane	5.0	0.15	0	ND	ND	ND
Trichloroethene	5.0	0.15	0	1.12	ND	ND
Vinyl Chloride	0.5	0.15	0	ND	ND	ND
Non-Halogenated Volatile Organics						
Benzene	1.0	0.15	0	ND	ND	ND
Ethylbenzene	5.0	0.15	0	ND	ND	ND
Toluene	5.0	0.15	0	ND	ND	ND
Xylenes	5.0	0.15 – 0.30	0	ND	ND	ND
Other						
Total Petroleum Hydrocarbons – Gasoline	50	35	0	ND	NM	ND
Total Petroleum Hydrocarbons – Diesel	50	24	1	61.0 J (80 U)	NM	43.0 J (79 U)
Total Petroleum Hydrocarbons – Motor Oil	50	24	0	ND	NM	ND
1,4-Dioxane	NA	0.20	0	NM	NM	0.58 J
Semi-volatile Organic Compounds	NA		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:

() = split sample analyzed at separate laboratory

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  $\mu g/L = micrograms per liter$ U = method blank contamination
#### TABLE 5

Summary of Groundwater Analytical Data for March 2018 – Subarea LF007C Groundwater Treatment Plant

	Detection	8 March 2018 (μg/L)			
Constituent	(μg/L)	EW614x07	EW615x07	MW210x06	
Halogenated Volatile Organics					
cis-1,2-Dichloroethene	0.15	0.15 J	ND	ND	
Trichloroethene	0.15	1.56	ND	ND	
Non-Halogenated Volatile Organics					
Benzene	0.15	ND	ND	ND	
Ethylbenzene	0.15	ND	ND	ND	
Toluene	0.15	ND	ND	ND	
Xylenes	0.15 – 0.30	ND	ND	ND	
Other					
Total Petroleum Hydrocarbons – Gasoline	35	ND	ND	ND	
Total Petroleum Hydrocarbons – Diesel	24	55.0 (82 U)	280 (170 U)	39.0 J (120 U)	
Total Petroleum Hydrocarbons – Motor Oil	24	ND	260 J	ND	
Semi-volatile Organic Compounds		ND	ND	ND	

Notes:

() = split sample analyzed at separate laboratory

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

NM = not measured

U = method blank contamination

μg/L = micrograms per liter





#### Report Number: 085 Reporting Period: 28 February 2018 – 30 March 2018

Date Submitted: 13 April 2018

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

#### **System Metrics**

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

Table 1 – Operations Summary – March 2018					
Initial Data Collection: 2/28/2018 12:35	Final Data Collection:	3/30/2018 13:10			
Operating Time:	Percent Uptime:	Electrical Power Usage:			
ST018GWTP: 718 hours	ST018GWTP: 99.6%	<b>ST018GWTP:</b> 151 kWh (112 lbs CO <sub>2</sub> generated <sup>a</sup> )			
Gallons Treated: 261,200 gallons	Gallons Treated Since March 2011: 14.6 million gallons				
Volume Discharged to Sanitary Sewer: 261,200 gallons	ons Final Totalizer Reading: 14,559,689 gallons				
Cumulative Volume Discharged to Sanitary Sewer since 1 November 2014: <b>8,063,515 gallons</b>					
MTBE, BTEX, VOC, TPH Mass Removed: 1.11 Ibs <sup>b</sup>	MTBE, BTEX, VOC, TPH Mass R	TBE, BTEX, VOC, TPH Mass Removed Since March 2011: 44.6 lbs			
MTBE (Only) Removed: <b>0.12 lbs</b> <sup>b</sup>	MTBE (Only) Mass Removed Sinc	ce March 2011: <b>10.8 lbs</b>			
Rolling 12-Month Cost per Total Pounds of Mass Removed: \$8,955 <sup>bc</sup>					
Monthly Cost per Pound of Mass Removed: \$3,785 <sup>bc</sup>					
<ul> <li><sup>a</sup> SiteWise<sup>™</sup> estimate that 1 kilowatt hour generated produces 0.74 pounds of GHG.</li> <li><sup>b</sup> Calculated using March 2018 EPA Method SW8260C and SW8015B analytical results.</li> <li><sup>c</sup> Costs include operations and maintenance, reporting, analytical laboratory, project management, and utility costs related to operation of the system.</li> </ul>					
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 – March 2018						
Location	Average Flow Rate Groundwater (gpm) <sup>a</sup>	Hours of Operation				
EW2014x18	1.2	718				
EW2016x18	1.2	718				
EW2019x18	1.3	718				
EW2333x18	1.6	718				
ST018GWTP	6.1	718				
<sup>a</sup> 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									
	Shutdown <sup>a</sup>		Restart <sup>a</sup>		Restart <sup>a</sup>		Restart <sup>a</sup>		
Location	Date	Time	Date	Time	Cause				
ST018GWTP	30 March 2018	10:00	30 March 2018	13:00	System was shut down because of high bag filter pressure.				
= Time not recorded <sup>a</sup> 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 6 March 2018. Results are presented in Table 4. The complete March 2018 laboratory data report is available upon request. The influent concentration for MTBE during the March 2018 sampling event was 54.3  $\mu$ g/L, which is a slight decrease from the February 2018 sample result of 57.4  $\mu$ g/L. TPH-d, TPH-g, BTEX components, and 1,2-DCA were also detected in the influent sample. MTBE and TPH-d were detected in the system effluent sampling location at concentrations less than the effluent limitations.

All concentrations of TPH are well below the Fairfield-Suisun Sewer District effluent limitation of 50,000  $\mu$ g/L for TPH-g and TPH-d, or 100,000  $\mu$ g/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  $\mu$ g/L is advised based on worker health and safety. Travis AFB will continue to monitor influent and effluent contaminant concentrations to maintain compliance with the Fairfield-Suisun Sewer District discharge permit.

The ST018GWTP was shut down on 30 March 2018 because of high pressures in the bag filters. The bag filters were changed out the same day, and the system was restarted.

Figure 1 presents plots of the average flow rate and influent total contaminant (MTBE, TPH-g, TPH-d, TPH-mo, BTEX, and VOCs) and MTBE concentrations at the ST018GWTP over the past twelve (12) months. The average flow rate through the ST018GWTP has been cyclical with flow rates decreasing during the dry season (summer and fall) and increasing during the rainy season (winter and spring). The overall average flow rates in the past 12 months show a decreasing trend because of the "pulse-mode" operations that were evaluated between October 2017 and January 2018. The MTBE concentration and total influent concentrations have generally been fluctuating over the past 12 months with a flat trend and an increasing trend, respectively.

#### **Optimization Activities**

No optimization activities occurred at the ST018GWTP in March 2018.

#### Sustainability

Travis AFB is committed to decreasing the amount of GHG produced directly (waste streams discharging GHG) or indirectly (GHG produced as related to electrical energy consumption) from all systems across Travis AFB. Travis AFB continues to optimize each treatment plant to reduce the amount of electrical energy consumed, and to implement sustainable treatment plant optimization programs, such as the solar arrays employed to power the ST018GWTP system.

Figure 2 presents the historical GHG production from the ST018GWTP. The ST018GWTP produced 112 pounds of GHG during March 2018 and treated 261,200 gallons of water. The amount of GHG produced is directly attributed to the amount of water treated through the system because the only line-power electrical use is for a transfer pump through the GAC system.

#### TABLE 4 Summary of Groundwater Analytical Data for March 2018– Site ST018 Groundwater Treatment Plant

	Instantaneous Maximum*	Detection		6 March 2018 (μg/L)	
Constituent	(µg/L)	(μg/L)	N/C	Influent	System Effluent
Fuel Related Constituents					
Methyl tert-Butyl Ether	6,400	0.15	0	54.3	2.60
Benzene	25,000ª	0.15	0	1.91	ND
Ethylbenzene	25,000ª	0.15	0	1.09	ND
Toluene	25,000ª	0.15	0	ND	ND
Total Xylenes	25,000ª	0.15 – 0.30	0	0.34 J	ND
Total Petroleum Hydrocarbons – Gasoline	50,000 <sup>b</sup>	35	0	409	ND
Total Petroleum Hydrocarbons – Diesel	50,000 <sup>b</sup>	15 – 16	0	43.0 J	43.0 J
Total Petroleum Hydrocarbons – Motor Oil	100,000	160 – 170	0	ND	ND
Other					
Acetone	NA	1.0	0	ND	ND
1,2-Dichloroethane	20	0.15	0	0.75	ND

\* In accordance with the Fairfield-Suisun Sewer District Effluent Limitations

Laboratory data available on request.

a – The limit of 25,000  $\mu\text{g/L}$  is a combined limit for BTEX.

b – The limit of 50,000  $\mu g/L$  is a combined limit for TPH-g and TPH-d

 $\mu g/L = micrograms per liter$ 

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

NA = not applicable

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

ND = not detected above method detection limit





#### Sites SD043 and SS046 Remedial Design/Remedial Action (RD/RA) Work Plans

RPM Meeting April 19, 2018

#### Work Plans

- Site SD043 RD/RA Work Plan
- Site SS046 RD/RA Work Plan

# Site SD043 Background

- Site SD043 consists of Building 916, which is an emergency electrical power facility located in west-central portion of the West/Annexes/Basewide Operable Unit (WABOU).
- Diesel-powered generators are housed inside the building.
- A fenced and graveled electrical transformer area was formerly located at the southwest exterior corner of the building.
- This fenced area contained three liquid filled transformers on top of a concrete pad.
- In 1992, one of the transformers leaked PCB-laden oil onto the concrete pad and ground surface.
- In 1993 the transformers and concrete pad were removed.

## Site SD043 Background

- PCB-1254 was detected in the soil near the former transformer pad at concentrations greater than the residential cleanup level.
- Land use restrictions were selected in 2003 for Site SD043 in the WABOU Soil ROD.
- In 2003 a new concrete pad with a generator and a transformer was constructed in the vicinity of the 1992 spill area.
- This new generator and transformer were removed from the concrete pad in 2017 and were not replaced.
- The selected remedial action for Site SD043 was changed in 2018 from Land Use Restrictions to excavation in the WABOU ROD Amendment to allow unlimited use and unrestricted exposure (UU/UE) for Site SD043.



VBROOKSIDEVGIS\_SHAREVENBG00\_PROJAVAIRFORCEVTRAVISAFBMAPFILESV017482366\_TECHMEMOWORKPLAN\_2017/SD043vFIGES-1\_SD043\_LOCATION/MXD\_SSCOPES 1/19/2018 10:40:17 AM

# Site SD043 Nature and Extent of Soil Contamination

- Concentrations of PCB-1254 exceeded the residential cleanup level (0.24 milligrams per kilogram [mg/kg]) in soil samples from three (3) borings (SB05, SH05, and SH08) at depths ranging from 4.0 to 10 feet (ft) below ground surface (bgs).
- The PCB-1254 concentrations in the three borings range from 0.38 to 2.0 mg/kg.
- The highest concentration of PCB-1254 (2.0 mg/kg) was observed in the soil sample that was collected at 10 ft bgs in boring SB05.



- Perform an excavation to remove the contaminated soil area near the former leaking transformer where PCB-1254 concentrations exceed residential cleanup levels.
- Remove the existing concrete pad.
- It is anticipated that the excavation will encompass an area of 5 ft long by 5 ft wide and will extend to a target depth of 10.5 ft bgs.
- Based on the design, approximately ten (10) cubic yards (yd<sup>3</sup>) of soil will be excavated.
- The design dimensions of the excavation may be expanded to allow for equipment and benching as necessary to safely perform the excavation.
- The final soil volume and excavation dimensions may also increase depending on the confirmation sample results.



- Since the excavation will occur near the south side of Building 916, soil buttressing, slot trenching, or shoring may be necessary to stabilize the sidewalls.
- To minimize the potential for side wall collapse, immediately following excavation to the design depth and confirmation sampling, the excavated area will be temporarily backfilled.
- A geotextile fabric will be used to delineate the excavated area from the temporary backfill to allow for sidewall or floor sampling, if necessary.
- As an additional safety measure, the stability of the excavation will be continually evaluated by the Engineer and Competent Person.

- In the event that the groundwater table is encountered and sidewalls are deemed unsafe based on the Engineer's and Competent Person's evaluation, a certified shoring system will be provided immediately.
- By using temporary backfill, dewatering is not anticipated.
- During the excavation, soil will be stockpiled onsite (either at the soil laydown area or at Site SD043) and profiled before being loaded for disposal.
- To separate the stockpiled soils from non-impacted surface soils, a minimum 10-mil polyethylene liner will be installed below the stockpiles.
- A minimum 6-mil sheeting will be used to cover the stockpiles at the end of each work day to prevent wind dispersion or runoff from precipitation events.

• A perimeter berm will also be installed at the base of each stockpile to prevent the release or infiltration of liquids, using either clean soil or wattles as necessary.

# Site SD043 Confirmation Sampling

- Following excavation, five (5) confirmation soil samples will be collected and analyzed for PCB-1254 by EPA Method SW8082A.
  - one (1) from each sidewall and one (1) from the excavation floor.
- The sidewall confirmation samples will be collected from between 4 and 6 ft bgs.

#### Site SD043 Backfill and Site Restoration

- Following excavation and confirmation that the soil containing PCB-1254 above the residential cleanup level has been removed, the excavation will be backfilled with imported clean soils or controlled low strength material.
- Once backfill is completed, the area will be restored to match the adjacent open space.

## Site SD043 Reporting

- Following completion of excavation and backfill, project completion activities will be reported in a Remedial Action Completion Report (RACR).
- The RACR will include the following:
  - Field methods used to carry out the excavation and surface restoration.
  - Soil sampling results and analysis.
  - Final extent of excavation.
  - Final volume and disposition of soil waste.

# Site SSO46 Background

- Site SSO46 is the Railhead Munitions Staging Area located in the north-central portion of the WABOU.
- The site consists of a railroad track and concrete pad that formerly served as a railhead at the south terminus of a spur off the Northern Sacramento and served as a weapons-handling facility from 1953 to 1962.
- The WABOU RI identified that polycyclic aromatic hydrocarbons (PAHs), pentachlorophenol, lead, and arsenic as chemicals of concern (COCs) for Site SS046.
- These contaminants are consistent with normal railroad operations.
- Land use restrictions were selected in 2003 for Site SS046 in the WABOU Soil ROD.

## Site SSO46 Background

- In 2016 and 2017, a data gap investigation was conducted to support risk management decisions based on an update of the risk to human health that considered a residential exposure scenario.
- Results of the data gap investigation facilitated the assessment whether additional remedial actions were necessary to remove the current Land Use Restrictions at Site SS046.
- The data gap investigation samples were collected because the original WABOU RI samples were analyzed using detection limits that are greater than the current residential screening levels.

### Site SSO46 Background

- Results of the data gap investigation indicated that metals, PAHs, and pentachlorophenol are present at concentrations that pose an unacceptable risk to human health based on residential and industrial land use scenarios.
- The selected remedial action for Site SS046 was changed in 2018 from Land Use Restrictions to excavation in the WABOU ROD Amendment. This will allow unlimited use and unrestricted exposure (UU/UE) for Site SS046.





# Site SSO46 Nature and Extent of Soil Contamination

- Concentrations of PAHs, lead, arsenic, and pentachlorophenol exceeded their residential cleanup levels in soil samples from five (5) borings (SB02, SB03, SB04, SB05, and SB06) at depths ranging from the surface to 6.5 ft bgs.
- PAH concentrations exceeded their cleanup levels at the surface in borings SB05 and SB06 and at 6.5 ft bgs in boring SB06.
- Concentrations of lead exceeded the cleanup level at the surface in borings SB02, SB03, and SB05.
- Arsenic concentrations exceeded the cleanup levels at the surface of borings SB02, SB03, and SB04.
- Concentrations of pentachlorophenol exceeded the cleanup levels in the surface at boring SB05.



- Perform a soil excavation to remove concentrations of PAHs, lead, arsenic, and pentachlorophenol that exceed residential cleanup levels from five (5) areas (A1 through A5).
- Four (4) of the soil excavation areas (A1, A2, A3, and A5) will initially be excavated to a depth of 6 inches.
- One (1) soil excavation area (A4) will be initially excavated to a depth of 7.0 ft bgs.
- The anticipated surficial area to be removed at three (3) of the excavation areas (A1, A3, and A4) is 100 square feet (ft<sup>2</sup>) each.
- More than 100 square ft of soil is anticipated to be removed from areas A2 (800 ft<sup>2</sup>) and A5 (650 ft<sup>2</sup>).



- Waste will be stockpiled onsite in roll-off containers.
- Excavated soil designated for offsite disposal will be transported to a suitable facility based on waste characterization results.

# Site SS046 Confirmation Sampling

- Following excavation, four (4) confirmation soil samples will be collected from each of the side walls of each excavation area.
- One (1) confirmation soil sample will be collected from the bottom of the excavation of areas A1, A3, and A4.
- Two (2) confirmation soil samples will be collected from the bottom of the excavation of areas A2 and A5.
- The confirmation samples will be analyzed for PAHs and/or metals by EPA Methods SW8270C/D-SIM and SW6010C, depending on what COCs are being removed from the excavation area.
- The sidewall confirmation samples will be collected from the mid-depth of the sidewall being sampled.

#### Site SSO46 Backfill and Site Restoration

- After final confirmation sample results are verified, the final extent of the excavations will be surveyed and the excavations will be backfilled to their original conditions.
- Clean backfill will be imported to complete the site restoration, and the surface will be graded level with the existing ground surface.

## Site SS046 Reporting

- Following completion of excavation and backfill, project completion activities will be reported in a RACR.
- The RACR will include the following:
  - Methods used to carry out the excavation.
  - Soil sampling results and analysis.
  - Final extent of excavation.
  - Impacts of environmental concern (if any occurred).
#### Questions

### Travis AFB Restoration Program

#### **Program Update**

RPM Meeting April 19, 2018

# Completed Documents (1)

- Vapor Intrusion Assessment Update
   Technical Memorandum
- 2012 CAMU Annual Report
- Old Skeet Range Action Memorandum
- 3<sup>rd</sup> Five-Year Review
- 2012 Annual Groundwater Remediation Implementation Status Report (GRISR)
- Subarea LF007C and Site SS030 Remedial Process Optimization Work Plan
- Pre-Design Site Characterization of SS029 Report
- Old Skeet Range Removal Action Work Plan
- 2013 CAMU Inspection Annual Report

- Groundwater Record of Decision (ROD)
- CG508 POCO Work Plan
- 2013 Annual GRISR
- FT004 Technology Demonstration Work Plan
- Kinder Morgan LF044 Land Use
   Control Report
- SD031 Technology Demonstration Work Plan
- TA500 Data Gap Investigation Work Plan
- ST018 POCO Work Plan Addendum
- SD037 GW RD/RA Work Plan
- Travis AFB UFP-QAPP
- DP039 Lead Excavation Technical Memo

# Completed Documents (2)

- Proposed Plan for ROD Amendment to WABOU Soil ROD
- Proposed Plan for ROD Amendment to NEWIOU Soil, Sediment, & Surface Water ROD
- SD034 Data Gap Investigation Work Plan
- POCO Investigation Work Plan for Oil-Water Separators
- ST032 POCO Soil Excavation Work
   Plan
- SD036 GW RD/RA Work Plan
- SS016 GW RD/RA Work Plan
- SS015 GW RD/RA Work Plan
- FT005 Technology Demonstration Work Plan
- 2014 Annual CAMU Monitoring Report

- Old Skeet Range PAH Delineation Report
- ST028 POCO Work Plan
- SS014 POCO TD Work Plan
- CG508 Site Investigation/Site Closure Request Report
- 2014 Annual CAMU Monitoring Report
- DP039 GW RD/RA Work Plan
- SD031 TDCCR
- ST018 POCO CCR
- Site SS030 Groundwater RA CCR
- Sites SD036 and SD037 Groundwater RACCR
- Site SS016 Groundwater RACCR
- Site SS015 Groundwater RACCR
- 2014 Annual GRISR
- Site CG508 Well Decommissioning Work Plan

# Completed Documents (3)

- Data Gap Investigation TM for Soil Sites SD033, SD043, & SS046
- Site FT004 Technology Demonstration Construction Completion Report
- Site SD031 Soil Remedial
   Investigation Work Plan
- Corrective Action Plan for DERA-Funded Oil Water Separators
- Site ST032 POCO Completion Report
- Site ST028 POCO Completion Report
- 2015 Annual CAMU Monitoring Report
- Site SD031 Remedial Investigation Work Plan
- Site SD034 Technology Demonstration Work Plan
- Site SS016 Soil Data Gaps Investigation Work Plan

- Multi-Site Bioaugmentation Technology Demonstration Work Plan
- Sites ST028 and ST032 POCO Well
   Decommissioning Work Plan
- Site TS060 Action Memorandum
- 2015 Annual GRISR
- FT005 Technology Demonstration Construction Completion Report
- Site CG508 POCO Well Decommissioning and Site Closeout Technical Memorandum
- Site DP039 Remedial Action
   Construction Completion Report
- ST028 POCO Well Decommissioning/Site Closeout Technical Memorandum
- Site TS060 Removal Action Work Plan

# Completed Documents (4)

- Multisite Technology Demonstration Construction Completion Report
- SS014 POCO Technology Demonstration Construction Completion Report
- Site LF044 Investigation Work Plan
- Site FT004 POCO Soil Data Gap
   Investigation Work Plan
- SD034 Technology Demonstration Construction Completion Report
- POCO Evaluation/Closeout Report for DERA-funded oil/water separators OW051, OW053, and OW054
- ST032 POCO Well Decommissioning and Site Closeout Technical Memorandum

- 2016 Annual CAMU Monitoring Report
- Work Plan for Fourth Five-year Review
- 2016 Annual GRISR
- Data Gap Investigation Results, Technical Memorandum for Soil, Sites SD033, SD043, SS046
- TS060 Removal Action Completion Report
- SS035 Site Closure Report
- AOC TA500 Data Gaps Investigation and Closure Report
- Site TS060 No Further Action
   Proposed Plan

## Completed Field Work (1)

- Replace battery banks at ST018
   Groundwater Treatment Plant
- Annual Groundwater Remediation Implementation Program (GRIP) Sampling event
- Well Decommissioning (9 Wells)
- Electrical repairs to FT005 extraction system (well EW01x05)
- Electrical repairs to Site SS029 extraction system
- Site ST018 carbon vessels upgrade
- 2014 GRIP Semiannual Sampling Event
- Pump repairs to Site SS016 well (EW610x16)
- Subsite LF007C optimization upgrades
- 2014 Annual GRIP Sampling Event
- Biological Resource Assessment
- Site CG508 Site Investigation
- Old Skeet Range Characterization Sampling

- 4Q Semiannual GRIP Sampling Event
- SD031 Technology Demonstration Well Installation
- SD037 Well Installation
- SD031 Trench/Conveyance/Power Installation
- SD031 EVO Injection
- ST018 Well Installation
- SS015 Well Installation
- SS016 Well Installation
- Well Development (SD036, SD037)
- ST018 Trench/Conveyance/Power Installation
- SD036 EVO Injection
- Well Development (SS015, SS016)
- Baseline Sampling (SS015, SS016)
- SS014 Data Gap Investigation
- SS016 EVO Injection
- TA500 Data Gaps Investigation

## Completed Field Work (2)

- 2015 Annual GRIP Sampling
- SD037 EVO Injection
- SD034 Data Gaps Investigation
- SS015 EVO Injection
- FT005 Injection Well Installation
- OWS 47, 48, 49 Site Investigations
- SS030 Trench/Conveyance/Power Installation
- FT005 Trench Installation
- FT005 Well Development
- FT004 Well Installation, Well Development, Baseline Sampling
- FT005 Baseline Sampling
- DP039 Well Installation, Well Development, Baseline Sampling
- FT004 EVO Injection
- FT004 Trench/Conveyance/Power Installation
- DP039 Infiltration Trench Installation

- TA500 Groundwater Sampling
- FT005 EVO Injection
- 2016 Q2 GRIP Sampling
- Data Gap Inv. for Soil Sites (SD043, SS046)
- SD031 Remedial Investigation Stepout Sampling (2<sup>nd</sup> round)
- DP039 EVO Injection
- CG508 Well Decommissioning
- SD033 Soil Sampling
- Multi-site Bioaugmentation Well
  Installation
- SD034 Technology Demonstration Well Installation
- SS014 Bioreactor Installation
- ST028 & ST032 Well
   Decommissioning

# Completed Field Work (3)

- SS016 Soil Data Gaps Investigation
- SD031 Remedial Investigation Soil Sampling (3<sup>rd</sup> round)
- Oil Water Separators Step-out Drilling
- OW055 Close-in-place
- Q4 2016 GRIP Sampling
- OW040 Soil Excavation/Surface Restoration
- OW057 Soil Excavation/Surface Restoration
- Multi-site Bioaugmentation & EVO
   Injection
- SD034 Technology Demonstration Bioreactor Installation
- OW050 Soil Sampling at Former Location of OWS

- OW055 Sidewalk Repairs
- SD031 Finish Soil Delineation (NE portion of site)
- Q2 2017 GRIP Sampling Event
- SS015 Optimization: Injection Well Installation
- DP039 Down-gradient Monitoring Well Installation (1<sup>st</sup> round)
- SD036 Optimization: Injection Well
  Installation
- SD031 Optimization: Injection Well Installation
- OW056 Site Excavation/Closure
- Well Re-development
- TS060 Removal Action

# Completed Field Work (4)

- FT004 POCO Soil Data Gaps
   Investigation
- LF044 Sediment Sampling
- FT004 EVO Optimization
- DP039 Install downgradient monitoring wells (2<sup>nd</sup> round)
- FT005 Install Extraction Wells
- DP039 Repair SBGR distribution headers
- Q4 2017 GRIP Sampling
- SD036 EVO Optimization
- SS015 EVO Optimization
- SD031 EVO Optimization
- FT005 Installation of Pumps and Controls in 5 New Extraction Wells
- Q1 2018 GRIP Sampling

• SD037 EVO reinjection

### **Documents In-Progress**

#### CERCLA

- Data Gap Investigation Results, Technical Memorandum for Site SS016
- Amendment to the WABOU Soil ROD for sites DP039, SD043, and SS046
- LF006, SS030, SD031 Aquifer Test Activities Tech Memo
- Monitoring Well Installation Tech Memo for Site DP039, Addendum to the RACCR
- SD043 RD/RA Work Plan
- Community Relations Plan (revised draft)
- SS046 RD/RA Work Plan

### **Documents In-Progress**

#### POCO

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

### Field Work In-Progress

#### CERCLA

• None

POCO

• None

### **Documents Planned**

CERCLA

•	SS015 Soil Sampling Plan	Apr
•	Amendment to the NEWIOU Soil ROD for Sites	
	SS016 and SD033	May
•	FT005 Extraction System Optimization Tech Memo	May
•	2017 Annual CAMU Monitoring Report	May
•	LF044 Sediment Sampling Report	May
•	EVO Sites FT004, SS015, SD031, & SD036 Optimization	
	Injections Tech Memo	Jun
•	SS016 RD/RA Work Plan	Jun
•	SD031 Soil RI/FS	Jul
•	2017 Annual GRISR	Jul

#### **Documents Planned**

POCO

• None

### Field Work Planned

CERCLA

•	Q2 2018 GRIP Sampling	Apr
•	SD034 Install barricade around SBGR	May
•	SD034 Repair collar around EW2450x34	May
•	FT005 EVO injection	May
•	SS015 Soil sampling	Jun
•	SD043 Soil excavation	Jul
•	SS046 Soil excavation	Aug
•	SS016 Soil excavation	Aug

#### POCO

•	FT004 POCO Soi	il Investigation
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Note: Contact Lonnie Duke if you would like to observe planned field work events Jun

#### Petroleum Technology Demonstration Projects (1)

- SS014: Recycled Drywall SBGR
  - Evaluate the effectiveness of sulfate (gypsum from crushed drywall) to enhance anaerobic biodegradation of petroleum in groundwater
  - Installation was completed November 2016
  - Results through first 9 months
    - TPH-G: 99% reduction in source area (1,900 to 15 J  $\mu g/L),$  34% for remaining 6 site wells (was 18% after 3 months)
    - TPH-D: 98% reduction in source area (5,500 to 130 J  $\mu\text{g/L}),$  61% for remaining 6 site wells (was 33% after 3 months)
    - Benzene: 98% reduction (22 to 0.24 J μg/L), 61% for remaining 6 site wells (was 49% after 3 months)
- SD034: Washboard SBGR
  - Evaluate the effectiveness of an oxygen-enhanced aerobic SBGR on reducing TPH as diesel (TPH-D) in groundwater
  - Installed six (6) SBGR trenches in November 2016
  - Below SBGR trench (MW811x34/PZSSAx34) through first 9 months
  - TPH-DRO baseline 9,600 ug/L reduced to 160 ug/L (98% reduction)
  - TPH-MRO baseline 2,300 ug/L reduced to 210 ug/L (91% reduction)
  - Plume hot spot monitoring well (MW02x34) through first 9 months
  - TPH-DRO baseline 8,300 ug/L reduced to 1,100 ug/L (87% reduction)
  - TPH-MRO baseline 1,500 ug/L reduced to 420 ug/L (72% reduction)
- \* SBGR = Subgrade Biogeochemical Reactor

#### CVOC Technology Demonstration Projects (2)

- Multisite Bioaugmentation: EVO and KB-1 Plus
  - Evaluate if addition of bioaugmentation substrate to an EVO injection will increase the rate of CVOC degradation
  - Initial injections were completed (Nov 2016)
  - Limited TOC dispersal at SD036, so installed additional injection wells and reinjected with nanoEVO in 2017
  - Too early to evaluate degradation rates; however:
    - ~50-70% TCE reduction at ST027B bioaugmentation area and low/fluctuating reductions at EVO only area
    - TCE fluctuations at SD036 bioaugmentation area (but 62% DCE decrease) and 99% decrease at EVO only area
- FT005: Distribution of EVO and KB-1 Plus
  - Evaluate total organic carbon (TOC) dispersion distances and rates for optimizing the remediation of 1,2-dichloroethane (DCA) in groundwater
  - Installation completed May 2016
  - Slightly elevated TOC and reduced COC concentrations in the north, TOC increase has not yet been observed in the central test area yet (distance may be too far for TOC dispersal using EVO)
  - Optimizated the GETs in southern portion of site in 2017, which may help accelerate TOC dispersal to support this TD

#### CVOC Technology Demonstration Projects (3)

- FT004: Distribution of EVO via SBGR and/or Groundwater Extraction
  - Determine effectiveness of TOC distribution through two different enhanced reductive dechlorination (ERD) approaches: (1) groundwater TOC recirculation using a combination EVO injection, infiltration SBGR trenches, and groundwater extraction; and (2) EVO injection with groundwater extraction
  - Installation completed April 2016
  - COC concentrations declined through year 1
    - ~50% total molar reduction plume-wide through first year
    - Max monitoring well TCE concentration reduced from 560 to 140  $\mu$ g/L
  - Limited TOC dispersal, additional EVO injection conducted with nanoEVO in 2017 to determine if this can enhance TOC dispersal (too early to evaluate results of reinjection)
    - Concentrations rebounded in 4Q17, but 2017 reinjection should support further reductions

#### **CVOC** Technology Demonstration Projects (4)

- SD031: EVO distribution via Gravel Chimneys
  - Determine if EVO injection and recirculation of groundwater through gravel chimneys can effectively distribute TOC horizontally in the subsurface to support ERD of 1,1dichloroethene (DCE)
  - Installation completed in April 2015
  - Early indications:
    - Reducing conditions have initiated as expected throughout the TD area and are supporting anaerobic degradation
    - TOC concentrations are increasing at several wells
    - Recirculation through chimneys has been successful relative to our design assumptions
    - 1,1-DCE (primary COC) concentrations have reduced by 96% (was 93%) (sum of key wells within TD area, excluding 2 wells to SW that increased)
    - Total Molar concentration (sum of CVOCs) has reduced by 93% (was 84%) (sum of key wells within TD area, excluding 2 wells to SW that increased)
    - Four (4) new EVO wells installed to SW to enhance TOC in problem areas (plume being pulled back towards extraction well causing increasing concentrations in this area), conducted reinjection of EVO in 2017
    - Too early to evaluate effect of reinjection on cross-gradient area

## Completed Documents (Historical1)

- Basewide Health & Safety Plan (HSP)
- Action Plan
- 2007/2008 GSAP Annual Report
- LF007C RPO Work Plan
- LF008 Rebound Study Work Plan
- SS014 Tier 1 POCO Evaluation Work
   Plan
- ST027B Site Characterization Work
   Plan
- SS030 RPO Work Plan
- ST032 POCO Technical Memo
- DP039 Bioreactor Work Plan
- 2008 Annual GWTP RPO Report
- Passive Diffusion Bag (PDB) Technical Memo
- RD/RA QAPP Update
- ST032 Tier 1 POCO Evaluation Work
   Plan
- Phytostabilization Demonstration Technical Memo
- Model QAPP

- LF008 Rebound Test Technical Memo
- Comprehensive Site Evaluation Phase II Work Plan
- Field Sampling Plan (FSP)
- SS016 RPO Work Plan
- ST018 POCO RA Work Plan
- Vapor Intrusion Assessment Report
- GSAP 2008/2009 Annual Report
- FT005 Data Gap Work Plan
- First, Second, & Third Site DP039 Sustainable Bioreactor Demonstration Progress Reports
- DP039 RPO Work Plan
- SD036/SD037 RPO Work Plan
- ST027B Site Characterization Report
- 2009 GWTP RPO Annual Report Natural Attenuation Assessment Report (NAAR)
- Union Creek Sites SD001 & SD033 Remedial Action Report
- CAMU 2008-2009 Monitoring Annual Report

## Completed Documents (Historical 2)

- Phytostabilization Study Report
- 2009/2010 Annual GSAP Report
- SS015 Remedy Optimization Field
   Implementation Plan
- Sites SS014 and ST032 Tier 1 POCO Evaluation Report
- SD036 Remedy Optimization Field
   Implementation Plan
- 2010 Annual CAMU Inspection Report
- Site ST018 POCO Baseline Implementation Report
- FT005 Data Gaps Investigation Report
- Comprehensive Site Evaluation Phase
   II Report
- 2010 Groundwater RPO Annual Report
- Focused Feasibility Study (FFS)
- Site ST027-Area B Human Health Risk Assessment
- Site ST027-Area B Ecological Risk
   Assessment
- Work Plan for Assessment of Aerobic Chlorinated Cometabolism Enzymes

- 2010/2011 Annual GSAP Report
- Baseline Implementation Report (Sites SS015, SS016, SD036, SD037, and DP039)
- 2011 CAMU Annual Report
- Technical and Economic Feasibility Analysis (TEFA)
- Work Plan for RPO of Sites SS016 and SS029
- Site LF007C Data Gaps Investigation Technical Memorandum
- Technical Memorandum for Assessment of Aerobic Chlorinated Cometabolism Enzymes
- Old Skeet Range Engineering Evaluation/Cost Analysis
- 2011 Groundwater Treatment RPO Annual Report
- Groundwater Proposed Plan (PP)
- FT005 Remedial Action Completion Report
- 2012 GSAP Technical Memorandum21

## Completed Field Work (Historical1)

- ST027B Gore Sorber Survey–Phase 1
- ST027B Field Sampling Phase 2
- GSAP 2008 Semi-annual Event
- ST027B Installation of Wells Phase 3
- SS014 Site Characterization
- LF008 Rebound Study
- GSAP Annual Sampling Event 2009
- SS030 Site Characterization–Phase 1
- ST027 Site Characterization Phase 3
- ST014 Monitor Well Install Subsite 3
- SD001/SD033 Sediment RA
- SS016 Site Characterization (OSA source area)
- ST018 Site Characterization
- SS030 Site Characterization (Off-base VOC Plume)
- DP039 Site Characterization (for Biobarrier Placement)
- SS014 & ST032 Q1 2010 MNA Sampling (2<sup>nd</sup> 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 (4<sup>th</sup> 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