

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

21 August 2013, 0930 Hours

Mr. Mark Smith, Travis Air Force Base (AFB), conducted the Restoration Program Manager's (RPM) meeting on 21 August 2013 at 0930 hours, at Travis AFB, California. Attendees included:

- | | |
|----------------------------|--|
| • Mark Smith | Travis AFB |
| • Glenn Anderson | Travis AFB |
| • Gregory Parrott | Travis AFB |
| • Dave Leeson (via phone) | AFCEC/ERC |
| • William Hall (via phone) | AFCEC/CZRW |
| • Dezso Linbrunner | USACE-Omaha |
| • Adriana Constantinescu | California Regional Water Quality Control Board (RWQCB) |
| • Jose Salcedo | California Department of Toxic Substances Control (DTSC) |
| • Nadia Hollan Burke | United States Environmental Protection Agency (USEPA) |
| • Wilson Clayton | Trihydro Corp. |
| • Glenn Leong | Trihydro Corp. |
| • Tony Chakurian | CH2M HILL |
| • Loren Krook | CH2M HILL |
| • Ashley Shaddy | CH2M HILL |
| • Mike Wray | CH2M HILL |

Handouts distributed at the meeting, and presentations included:

- | | |
|----------------|--|
| • Attachment 1 | Meeting Agenda |
| • Attachment 2 | Master Meeting and Document Schedule |
| • Attachment 3 | SBBGWTP Monthly Data Sheet (July 2013) |
| • Attachment 4 | CGWTP Monthly Data Sheet (July 2013) |
| • Attachment 5 | NGWTP Monthly Data Sheet (July 2013) |
| • Attachment 6 | ST018 Monthly Data Sheet (July 2013) |
| • Attachment 7 | Presentation: LF007C/SS030 Optimizations |

- Attachment 8 Presentation: SS029 Pre-Design Site Characterization
- Attachment 9 Presentation: Program Update: Activities Completed, In Progress and Upcoming

1. ADMINISTRATIVE

A. Previous Meeting Minutes

The 17 July 2013 RPM meeting minutes were approved and finalized as written.

Mr. Smith introduced Mr. Wilson Clayton, technical advisor with Trihydro.

B. Action Item Review.

Action items from July were reviewed.

Action item 1 still open: Travis AFB to research beneficial reuse of treated water. AFCEE is in agreement with treated water reuse using Defense Environmental Restoration Account (DERA) funds under the authority of a “net-zero policy” for the Air Force. Update, 16 January 2013: Mr. Duke said that an Air Force energy reduction contractor is looking into the cost of installing a pipe to convey treated water from the central plant to the duck pond. Update, 20 March 2013: Mr. Duke said Travis AFB is looking into energy management projects with respect to ways of reducing water usage. Due date changed to TBD. Update, 18 April 2013: Mr. Smith said that they have the attention of Civil Engineering Operations Flight regarding beneficial reuse.

21 August 2013: Mr. Linbrunner inquired if trucks with portable tanks could use the treated water for irrigation in remote areas. Mr. Smith thanked Mr. Linbrunner for the idea, but stated that such trucks on base are owned by the Horizontal Shop and used for very infrequent dust suppression operations. He further stated that they only hold about 2,000 gallons and the shop personnel prefer to fill them faster with our potable water supply.

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 18 September 2013. Mr. Linbrunner announced that the new PBC contract should be awarded at the end of August, and that a kick-off meeting will occur within a day or two around the September RPM meeting. An invitation will go out when a date has been selected that will coordinate with the regulatory agencies schedules.

Travis AFB Master Document Schedule

- Groundwater Record of Decision (ROD): The Draft to Agencies date is highlighted to note when Appendix A was sent to the agencies for review. Appendix A is a compendium of the groundwater conceptual site model information for all sites. Mr. Anderson reminded the agencies that a meeting is scheduled this afternoon and any comments regarding Appendix A can be discussed. Travis AFB will assist in any way to help accelerate the review process by means of weekly teleconferences if needed. Mr. Smith mentioned that, as part of the new PBC contract, periodic updates are to be made to the conceptual site models.
- 3rd Five-Year Review: No change to the schedule. This document is also scheduled to be discussed in the afternoon meeting.
- Potrero Hills Annex: (FS, PP, and ROD): No change to the schedule. Mr. Anderson said the Potrero Hills responsible parties have issued two reports: The Vegetation Investigation Report and The Oxidation Pond Report. Both reports have been submitted to RWQCB. The Oxidation Pond Report investigation concluded that perchlorate was not present in the oxidation pond. The Vegetation Investigation Report that investigated the vegetation and soil samples collected along the hillside between the Annex and Suisun Marsh (soil samples were collected about an inch below the vegetation) identified positive detections of perchlorate in all vegetation and soil samples. The risk evaluation concluded that the concentrations were below perchlorate levels that could pose potential adverse impacts to livestock and humans. The responsible parties believe the concentration levels to be a “non-issue”. However, it is up to the RWQCB to make that determination. Ms. Constantinescu asked if the reports draw any correlation of the well that had significant perchlorate levels with the oxidation pond or the vegetation investigation. Mr. Anderson said no and that is why more investigation is needed to define the perchlorate contaminant migration. He added that the next steps taken will be based on the guidance received from the RWQCB.
- Old Skeet Range Action Memorandum: No change to the schedule. This document is also on the schedule to be discussed in the afternoon meeting.
- Subarea LF007C and Site SS030 Remedial Process Optimization Work Plan: The Draft to Agencies date was changed to reflect the actual date the document was submitted. Mr. Chakurian said the document review is important because LF007C is located on a vernal pool and fieldwork needs to be conducted before the rainy season. A presentation will be provided later in this RPM meeting.
- Quarterly Newsletter (July 2013): All new dates need to be populated to reflect the 4th quarter. Topics to include ROD update status, and Old Skeet range.

- Groundwater Remediation Implementation Status Report (GRISR): Agency Comments Due date changed to reflect the date the comments were actually received. No changes made to the rest of the dates.
- Kinder Morgan LF044 Land Use Control Report: Dates are still TBD. Travis AFB is waiting on Kinder Morgan to prepare the report. Mr. Smith said he would make a note to follow up with them tomorrow.
- Pre-Design Site Characterization of SS029 Report: New document, all new dates. A presentation of the report will be made later in this RPM meeting.
- 2012 CAMU Annual Report: Moved to history.

Mr. Smith asked about suggesting a document review priority for the Regulatory Agencies. Mr. Anderson suggested that the document priority be determined in the meeting this afternoon pending agency comments.

2. CURRENT PROJECTS

Treatment Plant Operation and Maintenance Update

Mr. Duke is on leave, and could not attend this meeting, so Ms. Ashley Shaddy (CH2MHILL) reported on the treatment plant status.

South Base Boundary Groundwater Treatment Plant (see Attachment 3)

The South Base Boundary Groundwater Treatment Plant (SBBGWTP) performed at 100% uptime, and 3.8 million gallons of groundwater were extracted and treated during the month of July 2013. All of the treated water was discharged to Union Creek. The average flow rate for the SBBGWTP was 80.4 gallons per minute (gpm). Electrical power usage was 16,140 kWh and approximately 22,112 pounds of CO₂ were created (based on DOE calculation). Approximately 0.70 pounds of volatile organic compounds (VOCs) were removed in July. The total mass of VOCs removed since startup of the system is 439 pounds.

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

Ms. Shaddy said that all extraction wells are up and running with the exception of EW02x29 which the pump and motor will soon be replaced. Mr. Wray added site SS030 extraction wells have been completely rewired as well as site SS029, save the aforementioned well, and one electrical repair at FT005. No optimizations are planned at this point but will be considered in the future. Mr. Salcedo asked when the bioreactor will be sampled again. Mr. Chakurian said it is scheduled to be sampled in November 2013.

Central Groundwater Treatment Plant (see Attachment 4)

The Central Groundwater Treatment Plant (CGWTP) performed at 100% uptime with approximately 1.5 million gallons of groundwater extracted and treated during the

month of July 2013. All treated water was discharged to the storm drain. The average flow rate for the CGWTP was 31.4 gpm. Electrical power usage was 2,250 kWh for all equipment connected to the Central plant, and approximately 3,083 pounds of CO₂ were generated. Approximately 3.27 pounds of VOCs were removed from groundwater by the treatment plant in July. The total mass of VOCs removed since the startup of the system is 11,337 pounds.

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

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

North Groundwater Treatment Plant (see Attachment 5)

The North Groundwater Treatment Plant (NGWTP) performed at 100% uptime with approximately 20,240 gallons of groundwater extracted and treated during the month of July 2013. The average flow rate at the NGWTP was 0.17 gpm and electrical power use was 536 kWh for all the equipment connected to the North plant; approximately 734 pounds of CO₂ was generated. Approximately 5.2×10^{-4} pounds of VOCs were removed from the groundwater in July. The total mass of VOCs removed since the startup of the system is 174.3 pounds.

Optimization Activities for NGWTP: No optimization activities to report for the month of July.

Site ST018 Groundwater (MTBE) Treatment Plant (see Attachment 6)

The Site ST018 (MTBE) Treatment Plant (ST018 GWTP) performed at 91.3% uptime with approximately 214 thousand gallons of groundwater extracted and treated during the month of July 2013. All treated water was diverted to the storm drain. The average flow rate for the ST018 GWTP was 4.88 gpm. Electrical power usage for the month was 128 kWh for all equipment connected to the ST018 GWTP plant, which equates to the creation of approximately 175 pounds of CO₂. Approximately 0.32 pounds of BTEX, MTBE and TPH were removed from groundwater in July from the treatment plant. The total BTEX, MTBE and TPH mass removed since the startup of the system is 24.6 pounds.

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

Optimization Activities for ST018: On 5 July 2013 the trip point for the pressure switch on the treatment system was increased from 25 to 35 pounds per square inch. This increased our ability to treat groundwater by three times. See ST018 July monthly report for more details.

Presentations:

LF007C and SS030 Remedial Process Optimizations (see Attachment 7)

Mr. Chakurian and Ms. Shaddy reported on the LF007C and SS030 Remedial Process Optimizations Work Plan. Mr. Chakurian presented the previous and current investigations conducted at these sites, Ms. Shaddy presented on the optimization. See Attachment 7 for details. Highlights included:

Mr. Chakurian gave the presentation on the previous and current investigation conducted at sites LF007C and SS030:

Summary of Subarea LF007C objectives:

- Delineate the horizontal and vertical extent of the VOC plume off-base.
- Evaluate hydraulic connection of the vernal pool with the underlying groundwater.
- Evaluate VOC plume capture scenarios.

Subarea LF007C Previous Investigations:

- Installed 9 temporary piezometers and 4 monitoring wells at LF007C in October and November 2011 to delineate the off-base portion of the TCE plume.
- A groundwater elevation survey was conducted with the LF007C extraction wells were turned off in November 2011 and identified a groundwater trough beneath the TCE plume.
- Review of the lithologic logs of LF007C indentified a bedrock depression in the subsurface beneath the TCE plume. The bedrock depression, low area, causes a directional groundwater flow.
- Performed limited pump tests at the two extraction wells on 30 December 2011, which confirmed that the extraction wells can pump at a higher rate.
- Conducted groundwater modeling for pumping rates needed to achieve plume capture, a combined 'increased' extraction rate of 10 gpm for both extraction wells. Note: the two existing extraction wells were the first solar powered wells installed at Travis AFB, and were installed in 2004. The solar panels are small and the pumping rates achieved are <1 gpm per well.
- Results of the investigations concluded the need to delineate the southwestern portion of the TCE plume, an on base portion of the plume, to evaluate if existing extraction wells can achieve plume capture.

Follow-on Investigations (which is part of the initial investigation):

- Conducted continuous groundwater elevation survey inside the off-base portion of the vernal pool area from December 2011 to June 2012 using transducers to evaluate hydraulic connection between groundwater and the vernal pool.
- Installed 2 monitoring wells, converted 1 temporary piezometer into a monitoring well, and as part of the requirements of the biological opinion, Travis AFB abandoned 8 temporary piezometers, which were in the footprint of the vernal pool.
- Conducted groundwater elevation survey with extraction wells pumping to determine if the off-base portion of the TCE plume is captured.
- Performed a follow-up 72 hour pump test at extraction wells EW614x07 and EW615x07.
- Modeled groundwater capture with the maximum sustained pumping rates for the two extraction wells determined from the 72 hour pump test.

Winter 2011-2012 Groundwater Elevation Survey:

- Conducted continuous groundwater elevation surveys at 3 monitoring wells from, December 2011 to June 2012, using transducers to evaluate the connection between the vernal pool and the groundwater aquifer. This occurred during a very dry winter.
- The study results indicate the vernal pool appears to be connected hydraulically to the groundwater aquifer. (see attached maps for the groundwater elevations/contours, placement of the piezometers and monitor wells and TCE concentrations details)

Monitoring Well Installations and Temporary Piezometer Abandonments:

- Installed 2 new monitoring wells to delineate the southwestern portion of the TCE groundwater plume.
- Converted one of the temporary piezometers (in the vernal pool HP2007x07) into monitoring well MW2007x07 which had the highest TCE concentrations, in order to monitor the off-base portion of the TCE plume.
- Abandoned 8 temporary piezometers as required by the USFWS Biological Opinion from August 22 to 24 2012.
- Conducted groundwater elevation survey on 22 August 2012 with extraction well EW614x07 pumping (the 8 piezometers had not yet been removed providing more data points) to determine if the off-base portion of the TCE plume is captured. A groundwater depression was observed from the data, right within the center of the TCE plume.

72-Hour Groundwater Pump Test:

- Conducted a 72 hour groundwater pump test in September 2012.

- Baseline groundwater elevation survey with the two extraction wells turned off showed a groundwater trough beneath the TCE plume.
- The pump test showed maximum sustained pumping rates of 4.7 and 2.5 gpm at wells EW614x07 and EW615x07.

Groundwater Modeling:

- Two groundwater pumping scenarios were modeled.
- Groundwater pumping at 4 gpm in EW614x07 and 1.1 gpm in EW615x07 for 6 months per year does not appear to achieve plume capture.
- Groundwater pumping at 4 gpm in EW614x07, 1.1 gpm in EW615x07, and 4 gpm in a new on-base extraction well appears to achieve capture.
- The plan is to optimize LF007C in 2 phases: Phase 1 – optimize extraction well EW614x07 (i.e., upgrade the solar panels and battery system) and observe for 1 year to see if capture is obtained. Phase 2 – install new on-base extraction well if capture is not obtained. (see attached maps for the different groundwater modeling scenarios details)

Site SS030 Background:

- The existing Site SS030 Groundwater Extraction Treatment System (GETS) has obtained capture of TCE plume and is reducing the plume.
- Groundwater in the western and central portion of the plume has been remediated.
- Highest concentrations of the remaining TCE plume are located about 250 feet east of existing extraction wells.
- Installing an extraction well within the remaining TCE plume will significantly improve the efficiency of the SS030 GETS.
- Mr. Chakurian referred to a map of SS030 that shows Travis AFB base boundary and the plume contours. (see attached maps for details)

Ms. Burke asked if the private property owners have water rights, and do they have production well. Mr. Anderson said yes, one well and the well is about 80 feet deep and is monitored annually. The samples collected have all been non-detect. Mr. Chakurian added there are three extraction wells that help keep the TCE plume inside base easement on the private property.

Ms. Burke wanted guidance in reviewing the report. Specifically, is the focus on capture of the plume or cleanup. Mr. Smith said for off base plumes the goal is cleanup. Mr. Wray added that this plume is getting cleaned up pretty rapidly.

Ms. Shaddy gave the presentation on the optimization portion of the work plan:

Subarea LF007C GETS Optimization:

- Currently a 1 inch piping system connects the extraction wells to the NGWTP by running the groundwater from the extraction wells about 2,600 feet to the treatment plant. Then a transfer pump pushes the treated groundwater back to the Duck Pond. The optimization design is to build a new treatment plant in the vicinity of the extraction wells, install 2 inch piping that will tie into the existing 4 inch piping that goes directly to the Duck Pond. This system optimization will greatly reduce the pump sizing needed to extract groundwater, and push the water through the treatment system, and then to the Duck Pond. (see attached map for details)
- Upgrade the pump and solar panel at EW614x07 to maximize pumping capacity.
- Install an additional extraction well at subarea LF007C after one year of operation if capture has not been obtained.
- Relocate the treatment facility for subarea LF007C to reduce the pump distance and to maximize flow. (see attached map for details)
- The new treatment facility will tie into the existing Duck Pond conveyance line. (see attached that shows the design of the new treatment system)
- The new treatment plant will have a concrete pad, with fencing around it. The pad and fencing are being designed in accordance with Travis AFB architectural requirements.

Site SS030 GETS Optimization:

- The new extraction well will be installed in the lower portion of the plume. Install new power and control conduits and new conveyance pipe. This well will be tied into the SBBGWTP (see attached map for details)

Ms. Burke inquired about the desired work schedule. Mr. Wray said that the drilling companies are booked and to get this work completed this summer Travis AFB had to get on their calendar. The work will begin mid September. Mr. Wray reminded the regulators that these are all just upgrades. Mr. Smith said he will contact the landowners to notify them about when the work will be conducted.

SS029 Pre-Design Site Characterization Report (see Attachment 8)

Mr. Anderson gave a brief introduction on how this presentation ties into the previous presentation and also ties into the ROD. Currently the ROD states SS029 is a pump-and-treat site. This report is designed to assist the contractor who wins the new PBC contract to look at ways of optimizing cleanup; similar to the work plan presented on site SS030 and LF007C. Site SS029 is the most challenging plume on base due to its connection with site SS016. This site characterization was conducted to look at alternative ways of cleaning up the southern portion of the base. The South Base Boundary Groundwater Treatment Plant (SBBGWTP) is old, and in constant need of repair work, rewiring, and replacement of pumps and motors. In

addition, the amount of energy it takes to run the plant is high. Travis AFB wanted to look at alternatives to clean up the groundwater at the southern portion of the base more efficiently.

Mr. Leong gave the presentation on the SS029 Pre-Design Site Characterization Report:

Mr. Leong began by stating the focus on this investigation is to collect enough data for future evaluation for potential optimization “post ROD”. The investigation was mainly focused on Site SS029. The draft report was handed out to the agencies during the RPM meeting.

Background:

- Site SS016 and SS029 TCE and cis-1,2-DCE plumes are starting to commingle.
- The investigation of data gaps for evaluation of post-ROD potential remedial process optimization for SS016 and SS029 groundwater plumes.
- Focus was on the SS029 leading edge of the groundwater plume.
- The Final Work Plan was approved in September 2012: Proposed installing 12 groundwater wells; 9 soil borings (identify competent bedrock, in-situ treatment was an option); chemical, physical, microbiological testing; bench-scale column testing (site groundwater and site soil sent to lab for testing); aquifer testing; initial groundwater modeling was conducted to see how the groundwater would flow with FT005 and SS029 extraction wells turned off separately; and revision of initial groundwater modeling based on investigation.

Field Implementation:

- Installed 10 groundwater wells in July 2012; final depths between 18 to 30 feet; 2 well locations did not yield water and bedrock was encountered at 6 to 8 feet below ground surface (bgs); wells developed in August 2012. (see attached map for well placement locations)
- 9 soil borings completed in July 2012; bedrock encountered in some borings between 6 to 8 feet bgs, some bedrock daylighted toward the west (i.e., outcrops); and at other locations bedrock was encountered between 29 to 30 feet.
- Soil and groundwater samples were collected; chemical, physical, microbiological testing; bench scale column testing using zero valent iron and biological amendment.
- Aquifer testing; slug test, step-down test and continuous rate pumping.

Results:

- Groundwater samples for chlorinated solvents similar to current groundwater samples in the area.

- Developed groundwater well boring logs, soil boring logs and used historical boring logs to map competent bedrock. A ridge present along western edge that may affect groundwater flow, regardless of pumping.
- Microbiological testing indicates limited detection of dehalococcoides bacteria. But low chlorinated solvent mass and aerobic conditions at leading edge of SS029 not conducive to dehalogenation via dehalococcoides.
- Column testing using spiked groundwater yielded effective degradation for ZVI and biological treatment to MCLs.
- Revised groundwater modeling incorporated: Soil physical testing results, boring logs and aquifer testing.
- Revised groundwater modeling under various scenarios indicates similar groundwater flow as currently observed with slight widening at the leading edge.
- The data generated and evaluation may be used post-ROD to evaluate potential remedial process optimization.

Mr. Anderson invited the regulatory agencies when reviewing this report to make any recommendations/suggestions for the next PBC contractor.

Mr. Smith thanked the regulatory agencies for allowing Travis AFB to conduct this investigation. Mr. Smith also thanked Trihydro and CH2M HILL for their calibrating efforts in sharing/exchanging data to pull this report together.

Program Update: Activities Completed, In Progress and Upcoming (see Attachment 9)

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

Newly Completed Documents: 2012 CAMU Annual report.

Newly Completed Field Work: Electrical repairs to FT005 extraction system (well EW01x05).

In-Progress Documents: Groundwater Record of Decision, 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.

In-Progress Field Work: Electrical repairs to Site SS029 extraction system. Pump repairs to Site SS016 (well EW610x16).

Upcoming Documents: Kinder Morgan LF044 Land Use Control Report.

Upcoming Field Work: Subsite LF007C optimization upgrades, Site SS030 optimization upgrades, Site ST018 carbon vessel upgrades, SCADA upgrade for CGWTP and SBBGWTP, Wellhead Maintenance (approximately 20 wells).

Mr. Wray said the Perimeter Road is closed due to repaving this month and samples have not been collected at SBBGWTP due to the road closure. If Perimeter Road reopens in August, the confirmation sample data analysis collected for SBBGWTP maybe late for September's RPM meeting.

4. New Action Item Review

Mr. Smith/Travis AFB will contact AMEC to provide an update to regulatory agencies on the LF044 Land Use Control Report.

5. PROGRAM/ISSUES/UPDATE

Mr. Smith said this could be the last RPM meeting held in this conference room. Environmental Restoration is in line to move into a new building, the decision will be finalized in a meeting this afternoon.

6. Action Items

| Item # | Responsible | Action Item Description | Due Date | Status |
|--------|-------------|--|----------|--------|
| 1. | Travis AFB | Research beneficial reuse of treated water and give update. Update (13 June 2012): AFCEE is in agreement with treated water reuse using Defense Environmental Restoration Account (DERA) funds under the authority of a "net-zero policy" for the Air Force. Update (15 August 2012): Mr. Duke reported that irrigation lines were destroyed by a communications contractor and not repaired because the system was inactive. Travis AFB will get the system design information to determine if the trunk line is still intact and repairs can be made to get the system running. Update, 16 | TBD | Open |

| | | | | |
|----|------------|---|-----|------|
| | | January 2013: Mr. Duke said that an Air Force energy reduction contractor will look into the cost of installing a pipe to convey treated water from the central plant to the duck pond. Update, 20 March 2013: Mr. Duke said Travis AFB is looking into energy management projects with respect to ways of reducing water usage. Due date changed to TBD. | | |
| 2. | Travis AFB | Smith/Travis AFB will contact AMEC to provide an update to regulatory agencies on the LF044 Land Use Control Report. | TBD | Open |

TRAVIS AIR FORCE BASE
ENVIRONMENTAL RESTORATION PROGRAM
RESTORATION PROGRAM MANAGER'S MEETING
BLDG 570, Main Conference Room
21 August 2013, 9:30 A.M.
AGENDA

1. ADMINISTRATIVE

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

2. CURRENT PROJECTS

- A. TREATMENT PLANT OPERATION AND MAINTENANCE UPDATE

3. PRESENTATION

- A. LF007C/SS030 OPTIMIZATIONS (CH2M HILL)
- B. SS029 PRE-DESIGN SITE CHARACTERIZATION (TRI-HYDRO)
- C. PROGRAM UPDATE: ACTIVITIES COMPLETED, IN PROGRESS AND UPCOMING

4. NEW ACTION ITEM REVIEW

5. PROGRAM/ISSUES/UPDATE

NOTES: AFTER THE RPM MEETING WE WILL HOLD SEVERAL SEPARATE MEETINGS TO DISCUSS REGULATORY COMMENTS ON THE NEW APPENDIX A OF THE DRAFT GROUNDWATER ROD, THE THIRD FIVE-YEAR REVIEW REPORT, AND THE DRAFT OLD SKEET RANGE ACTION MEMORANDUM. ALL PARTICIPANTS ARE WELCOME TO ATTEND.

(2013)
Annual Meeting and Teleconference Schedule

| Monthly RPM Meeting¹ (Begins at 9:30 a.m.) | RPM Teleconference (Begins at 10:00 a.m.) | Restoration Advisory Board Meeting (Begins at 7:00 p.m.) (Poster Session at 6:30 p.m.) |
|--|--|---|
| 01-16-13 | — | — |
| 02-20-13 | — | — |
| 03-20-13 | — | — |
| 04-18-13 (Thur 2:00 PM) | — | 04-18-13 |
| 05-22-13 | — | — |
| Cancelled | — | — |
| 07-17-13 | — | — |
| 08-21-13 | — | — |
| 09-18-13 ² | — | — |
| 10-17-13 (Thur 2:00 PM) | — | 10-17-13 |
| 11-20-13 | — | — |
| — | — | — |

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

² Note: Meetings will alternate between face to face and teleconferences after the GW ROD is final.

Travis AFB Master Meeting and Document Schedule

| PRIMARY DOCUMENTS | | |
|-------------------------------------|---|--|
| Life Cycle | Groundwater Record of Decision Travis, Glenn Anderson CH2M HILL, Leah Waller | 3 rd Five-Year Review Travis AFB, Glenn Anderson J.C. Palomar, Chris Bason |
| Scoping Meeting | 01-24-07 (11-30-11) | 10-31-12 |
| Predraft to AF/Service Center | 11-28-12 | 03-08-13 |
| AF/Service Center Comments Due | 12-12-12 | 03-27-13 |
| Draft to Agencies | 01-02-13 ¹ | 05-21-13 |
| Draft to RAB | 01-02-13 ¹ | 05-21-13 |
| Agency Comments Due | 03-03-13 (04-05-13) | 07-23-13 |
| Response to Comments Meeting | TBD² | 08-06-13 |
| Public Comment Period | NA | NA |
| Public Meeting | NA | NA |
| Response to Comments Due | TBD | 08-20-13 |
| Draft Final Due | TBD | 08-26-13 |
| Final Due | TBD | 09-25-13 |

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

² Pending Air Force legal review of responses to agency comments

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 | MMRP Old Skeet Range Action Memorandum Travis AFB, Glenn Anderson Baywest, Steve Thornton | Subarea LF007C and Site SS030 Remedial Process Optimization Work Plan Travis AFB, Lonnie Duke CH2M HILL, Tony Chakurian |
| Scoping Meeting | NA | NA |
| Predraft to AF/Service Center | 01-10-13 | 07-19-13 |
| AF/Service Center Comments Due | 01-28-13 | 08-02-13 |
| Draft to Agencies | 02-20-13 | 08-09-13 (08-07-13) |
| Draft to RAB | 02-20-13 | 08-09-13 (08-07-13) |
| Agency Comments Due | 03-22-13 (04-08-13) | 09-09-13 |
| Response to Comments Meeting | TBD | 09-18-09 |
| Response to Comments Due | TBD | 09-25-13 |
| Draft Final Due | NA | NA |
| Final Due | TBD | 09-25-13 |
| Public Comment Period | NA | NA |
| Public Meeting | NA | NA |

Travis AFB Master Meeting and Document Schedule

| INFORMATIONAL DOCUMENTS | | | | |
|---|--|--|--|---|
| Life Cycle | Quarterly Newsletters (July 2013) Travis, Glenn Anderson | Groundwater Remediation Implementation Status Report Travis AFB, Lonnie Duke CH2M HILL, Royer/Berwick | Kinder Morgan LF044 Land Use Control Report Travis AFB, Glenn Anderson Kinder Morgan, Nick Ricono | Pre-Design Site Characterization of SS029 Travis AFB, Lonnie Duke Tri-Hydro, Glenn Leong |
| Scoping Meeting | NA | NA | NA | NA |
| Predraft to AF/Service Center | NA | 03-28-13 | TBD | 06-27-13 |
| AF/Service Center Comments Due | NA | 04-11-13 (04-18-13) | TBD | 07-29-13 |
| Draft to Agencies | 07-10-13 | 05-14-13 | TBD | 08-21-13 |
| Draft to RAB | NA | 05-14-13 | TBD | 08-21-13 |
| Agency Comments Due | 07-24-13 | 06-13-13 (07-03-13) | TBD | 09-20-13 |
| Response to Comments Meeting | TBD | 08-21-13 | TBD | 09-25-13 |
| Response to Comments Due | 07-31-13 | 09-04-13 | TBD | 10-16-13 |
| Draft Final Due | NA | NA | NA | NA |
| Final Due | 07-31-13 | 09-04-13 | TBD | 10-16-13 |
| Public Comment Period | NA | NA | NA | NA |
| Public Meeting | NA | NA | NA | NA |

Travis AFB Master Meeting and Document Schedule

| HISTORICAL | |
|-------------------------------------|--|
| Life Cycle | 2012 CAMU Annual Report |
| | Travis AFB, Lonnie Duke ITSI, Rachel Hess |
| Scoping Meeting | NA |
| Predraft to AF/Service Center | 03-25-13 |
| AF/Service Center Comments Due | 04-01-13 |
| Draft to Agencies | 04-15-13 |
| Draft to RAB | 04-15-13 |
| Agency Comments Due | 05-15-13 |
| Response to Comments Meeting | 05-22-13 |
| Response to Comments Due | 05-31-13 (07-12-13) |
| Draft Final Due | NA |
| Final Due | 05-31-13 (07-15-13) |
| Public Comment Period | NA |
| Public Meeting | NA |

South Base Boundary Groundwater Treatment Plant

Monthly Data Sheet

Report Number: 155

Reporting Period: 28 June 2013 – 31 July 2013

Date Submitted: 19 August 2013

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 operation data from the July 2013 reporting period.

| Table 1 – Operations Summary – July 2013 | | | |
|--|-----------|--|---|
| Initial Data Collection: | | 06/28/2013 16:30 | Final Data Collection: 07/31/2013 16:00 |
| Operating Time: | | Percent Uptime: | Electrical Power Usage: |
| SBBGWTP: | 791 hours | SBBGWTP: | 100 % |
| | | SBBGWTP: | 16,140 kWh (22,112 lbs CO ₂ generated ^a) |
| Gallons Treated: 3.8 million gallons | | Gallons Treated Since July 1998: 829 million gallons | |
| Volume Discharged to Union Creek: 3.8 million gallons | | | |
| VOC Mass Removed: 0.70 lbs ^b | | VOC Mass Removed Since July 1998: 439 lbs | |
| Rolling 12-Month Cost per Pound of Mass Removed: \$9,871 ^c | | | |
| Monthly Cost per Pound of Mass Removed: \$11,165 | | | |
| lbs = pounds | | | |
| ^a Based on Department of Energy estimate that 1 kilowatt hour generated produces 1.37 pounds of GHG. | | | |
| ^b Calculated using July 2013 EPA Method SW8260B analytical results. | | | |
| ^c Costs include operations and maintenance, reporting, analytical laboratory, project management, and utility costs related to operation of the system. | | | |

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

| Table 2 – SBBGWTP Average Flow Rate (gpm) ^{a,b} | | | | | | | |
|---|---------|----------|---------|-------------------|---------|-------------------|------|
| FT005 ^c | | | | SS029 | | SS030 | |
| EW01x05 | 2.6 | EW736x05 | Offline | EW01x29 | 0.5 | EW01x30 | 1.8 |
| EW02x05 | 1.7 | EW737x05 | Offline | EW02x29 | Offline | EW02x30 | 2.4 |
| EW03x05 | Offline | EW742x05 | Offline | EW03x29 | 4.8 | EW03x30 | 1.9 |
| EW731x05 | Offline | EW743x05 | Offline | EW04x29 | 6.0 | EW04x30 | 23.5 |
| EW732x05 | Offline | EW744x05 | Offline | EW05x29 | 8.0 | EW05x30 | 19.1 |
| EW733x05 | Offline | EW745x05 | Offline | EW06x29 | Dry | EW06x30 | Dry |
| EW734x05 | 4.2 | EW746x05 | Offline | EW07x29 | Dry | EW711x30 | 18.6 |
| EW735x05 | 11.0 | | | | | | |
| FT005 Total: 19.5 | | | | SS029 Total: 19.3 | | SS030 Total: 86.6 | |
| SBBGWTP Average Monthly Flow ^c : 80.4 gpm | | | | | | | |
| ^a Extraction well flow rates are based on instantaneous weekly readings collected at the end of the month. | | | | | | | |
| ^b The average groundwater flow rate was calculated using the Union Creek Discharge Totalizer and dividing it by the total time in the reporting period. | | | | | | | |
| ^c Most extraction wells at FT005 were taken offline in accordance with the 2008 Annual Remedial Process Optimization Report for the Central Groundwater Treatment Plant, North Groundwater Treatment Plant, and South Base Boundary Groundwater Treatment Plant. | | | | | | | |
| gpm – gallons per minute | | | | | | | |
| Recharge –not pumping while the well recharges. | | | | | | | |
| SBBGWTP – South Base Boundary Groundwater Treatment Plant | | | | | | | |

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

| Table 3 – Summary of System Shutdowns | | | | | |
|---|----------|------|---------|------|-------|
| Location | Shutdown | | Restart | | Cause |
| | Date | Time | Date | Time | |
| | None | NA | | | |
| SBBGWTP = South Base Boundary Groundwater Treatment Plant | | | | | |

Summary of O&M Activities

Monthly groundwater samples at the SBBGWTP were collected on 16 July 2013. Sample results are presented in Table 4. The total VOC concentration (22.0 µg/L) in the influent sample has increased since the June 2013 sample (7.7 µg /L) was collected. 1,2-DCA (0.48 J µg/L), chloroform (0.18 J µg/L), cis-1,2-DCE (0.81 J µg/L), and TCE (20.5 µg/L) were detected at the influent sampling location in July 2013. Cis-1,2-DCE (0.42 J µg/L) and TCE (0.23 J µg/L) were also detected at the midpoint sampling location. No contaminants were detected at the effluent sampling location.

At the conclusion of wiring repair activities at Site SS029 in June, additional equipment failures were identified at three (3) Site SS029 extraction wells, EW02x29, EW06x29, and EW07x29. On 5 July 2013, a new variable frequency drive (VFD) was installed at EW07x29, along with a repaired 24VDC converter and a transformer, relocated from EW06x29, and the extraction well was brought on line. A new transformer was received and installed at EW06x29 and 10 July 2013. A new pump has been ordered for installation at EW02x29, which will be installed in August. The power wiring for extraction well EW01x05 was also replaced on 5 July 2013 after heavy corrosion was identified on the wiring resulting in a ground fault. With the exception of EW02x29, all of the extraction wells feeding the SBBGWTP are now on line as planned.

Figure 1 presents a plot of influent concentrations and average flow at the SBBGWTP over the past twelve (12) months. The influent concentration has begun to increase as expected with the Site SS029 extraction wells back online. Extraction wells at Site SS029 typically produce groundwater with very high TCE concentrations relative to others that contribute to the SBBGWTP.

Optimization Activities

No optimization activities were performed in July 2013.

Sustainability

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

Figure 2 presents the historical GHG production from the SBBGWTP. The SBBGWTP produced approximately 22,112 pounds of GHG during July 2013. GHG production has decreased (from 24,496 pounds) since June 2013. However, it is suspected that this decrease is the result of data collection from a different electric meter than what was read during the previous reporting period. During optimization activities at Site SS030, troubleshooting will be performed to identify and correct potential discrepancies between the two electric meters. The overall energy consumption levels remain consistent with the general decrease in energy demand since the air stripper was bypassed, and the GAC system was brought online.

TABLE 4

Summary of Groundwater Analytical Data for July 2013 – South Base Boundary Groundwater Treatment Plant

| Constituent | Instantaneous Maximum* (µg/L) | Detection Limit (µg/L) | N/C | 16 July 2013 (µg/L) | | |
|---|-------------------------------------|------------------------------|-----|------------------------|----------|----------|
| | | | | Influent | Midpoint | Effluent |
| Halogenated Volatile Organics | | | | | | |
| Carbon Tetrachloride | 0.5 | 0.14 | 0 | ND | ND | ND |
| Chloroform | 5.0 | 0.16 | 0 | 0.18 J | ND | ND |
| 1,1-Dichloroethane | 5.0 | 0.50 | 0 | ND | ND | ND |
| 1,2-Dichloroethane | 0.5 | 0.15 | 0 | 0.48 J | ND | ND |
| 1,1-Dichloroethene | 5.0 | 0.19 | 0 | ND | ND | ND |
| cis-1,2-Dichloroethene | 5.0 | 0.19 | 0 | 0.81 J | 0.42 J | ND |
| trans-1,2-Dichloroethene | 5.0 | 0.33 | 0 | ND | ND | ND |
| Methylene Chloride | 5.0 | 0.66 | 0 | ND | ND | ND |
| Tetrachloroethene | 5.0 | 0.21 | 0 | ND | ND | ND |
| 1,1,1-Trichloroethane | 5.0 | 0.14 | 0 | ND | ND | ND |
| 1,1,2-Trichloroethane | 5.0 | 0.20 | 0 | ND | ND | ND |
| Trichloroethene | 5.0 | 0.19 | 0 | 20.5 | 0.23 J | ND |
| Vinyl Chloride | 0.5 | 0.18 | 0 | ND | ND | ND |
| Non-Halogenated Volatile Organics | | | | | | |
| Benzene | 1.0 | 0.17 | 0 | ND | ND | ND |
| Ethylbenzene | 5.0 | 0.22 | 0 | ND | ND | ND |
| Toluene | 5.0 | 0.14 | 0 | ND | ND | ND |
| Xylenes | 5.0 | 0.23 – 0.5 | 0 | ND | ND | ND |
| Other | | | | | | |
| Total Petroleum Hydrocarbons – Gasoline | 50 | 8.5 | 0 | NM | NM | ND |
| Total Petroleum Hydrocarbons – Diesel | 50 | 50 | 0 | NM | NM | ND |
| Total Suspended Solids (mg/L) | NE | 1.0 | 0 | 20 | NM | NM |

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

Notes:

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

mg/L = milligrams per liter

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

ND = not detected

NE = not established

NM = not measured

µg/L = micrograms per liter

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

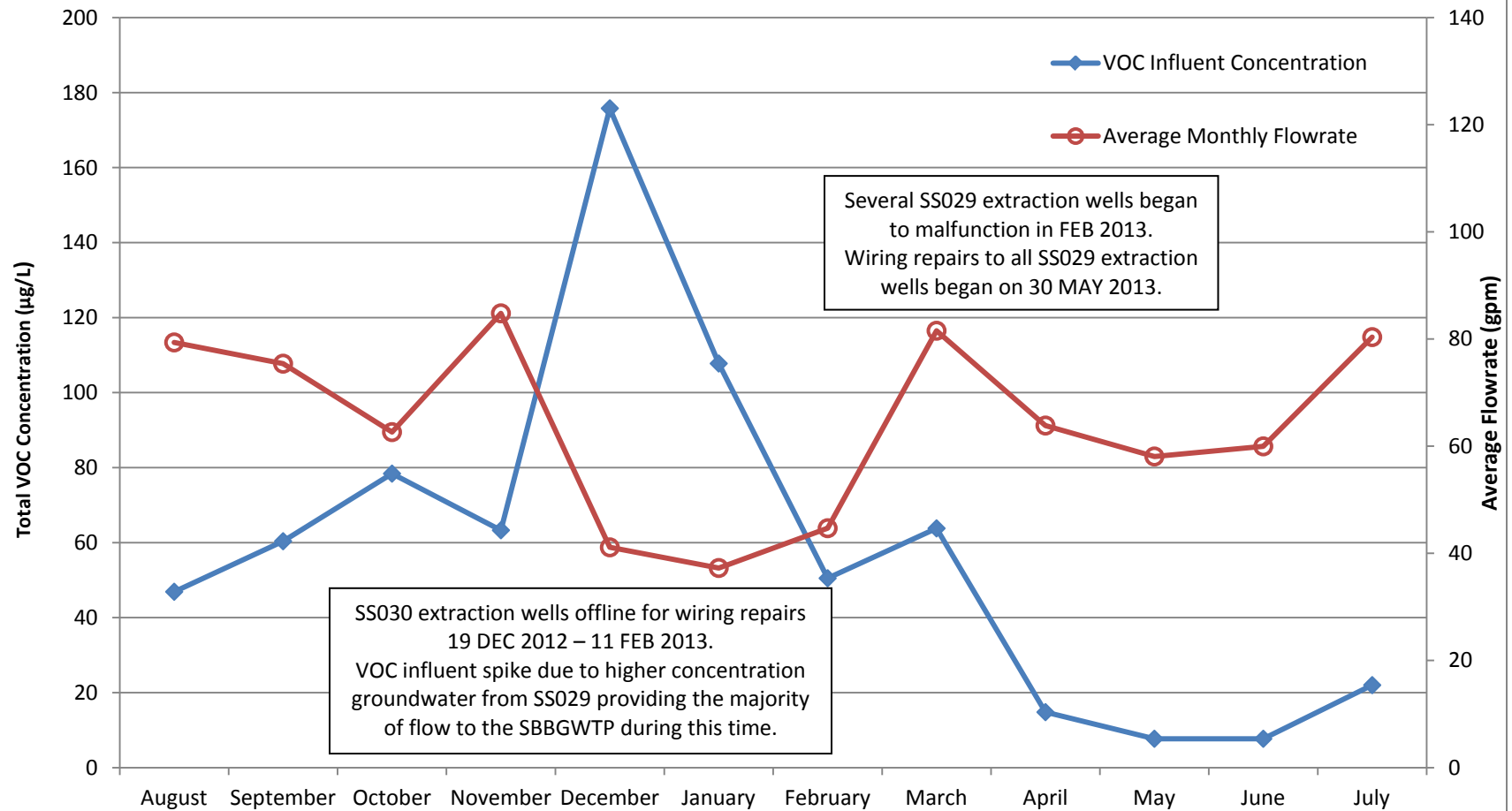
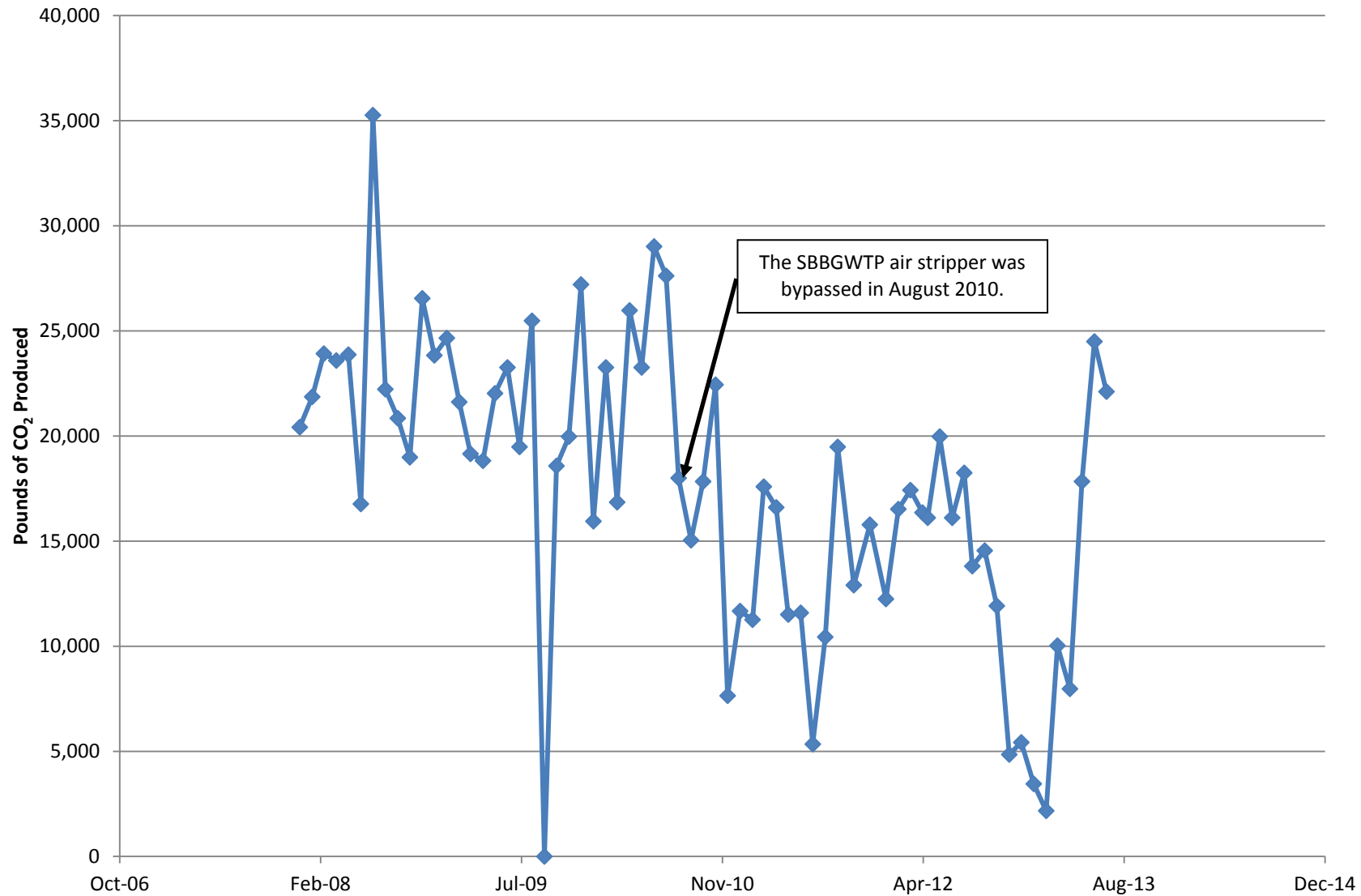


Figure 2

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



Central Groundwater Treatment Plant Monthly Data Sheet

Report Number: 168

Reporting Period: 28 June 2013 – 31 July 2013

Date Submitted: 19 August 2013

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

System Metrics

Table 1 presents operational data from the July 2013 reporting period.

| Table 1 – Operations Summary – July 2013 | | | |
|--|------------------|---|--|
| Initial Data Collection: | 06/28/2013 12:15 | Final Data Collection: | 07/31/2013 17:45 |
| Operating Time: | | Percent Uptime: | Electrical Power Usage: |
| CGWTP: 798 hours | | CGWTP: 100% | CGWTP: 2,250 kWh (3,083 lbs CO ₂ generated ^a) |
| WTP: Water: 0 hours Vapor: 0 hours | | WTP: Water: 0% Vapor: 0% | WTP: 0 kWh |
| Gallons Treated: 1.5 million gallons | | Gallons Treated Since January 1996: 483 million gallons | |
| VOC Mass Removed: | | VOC Mass Removed Since January 1996: | |
| 3.27 lbs ^b (groundwater only) | | 2,651 lbs from groundwater | |
| 0 lbs (vapor only) | | 8,686 lbs from vapor | |
| Rolling 12-Month Cost per Pound of Mass Removed: \$3,000 ^c | | | |
| Monthly Cost per Pound of Mass Removed: \$1,753 | | | |
| ^a Based on Department of Energy estimate that 1 kilowatt hour generated produces 1.37 pounds of GHG. | | | |
| ^b Calculated using July 2013 EPA Method SW8260B analytical results. | | | |
| ^c Costs include operations and maintenance, reporting, analytical laboratory, project management, and utility costs related to operation of the CGWTP and are reported based on the calendar month. | | | |

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

| Table 2 – CGWTP Average Flow Rates ^a | | |
|---|-------------------|--------------------------------|
| Location | Average Flow Rate | |
| | Groundwater (gpm) | Soil Vapor (scfm) ^b |
| EW01x16 | 20.1 | Offline |
| EW02x16 | 7.2 | Offline |
| EW03x16 | 0.2 ^c | Offline |
| EW605x16 | 7.3 | Offline |
| EW610x16 | 0.0 | Offline |
| CGWTP | 31.4 | -- |
| WTTP | -- ^b | Offline |

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

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

| Table 3 – Summary of System Shutdowns | | | | | |
|---|----------|------|---------|------|-------|
| Location | Shutdown | | Restart | | Cause |
| | Date | Time | Date | Time | |
| CGWTP (Groundwater) | | | | | |
| | None | NA | | | |
| WTTP | | | | | |
| | None | NA | | | |
| CGWTP = Central Groundwater Treatment Plant WTTP = West Transfer Treatment Plant | | | | | |

Summary of O&M Activities

Monthly groundwater samples were collected at the CGWTP on 16 July 2013. Sample results are presented in Table 4. The total VOC concentration (261.20 µg/L) in the influent sample has decreased since the June 2013 sample (354.81 µg/L) was collected. Concentrations of 1,1-Dichloroethene (0.68 µg/L), cis-1,2-DCE (29.2 µg/L), tetrachloroethene (0.84 µg/L), trans-1,2-Dichloroethene (2.2 µg/L), TCE (228 µg/L), and vinyl chloride (0.28 µg/L) were detected at the influent sampling location. Vinyl chloride was also detected at the sample location after the Carbon 1 vessel.

No contaminants were detected downstream of the Carbon 2 vessel or in the effluent sampling locations. Travis Air Force Base will continue to monitor contaminant concentrations at the CGWTP for breakthrough at the Carbon 1 vessel.

Figure 1 presents a plot of influent concentrations (total VOCs) and the influent flow rate at the CGWTP versus time for the past twelve (12) months. The average flow rate through the treatment plant continued to decrease in July 2013. Additional troubleshooting at extraction well EW610x16 revealed that the splines had been stripped. A replacement pump has been ordered and is expected to be installed in August 2013.

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

Optimization Activities

No optimization activities occurred at CGWTP in July 2013.

Sustainability

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

Figure 2 presents the historical GHG production from the systems associated with the CGWTP. The CGWTP produced approximately 3,083 pounds of GHG during July 2013. This is an increase from the amount produced in June 2013 (approximately 2,614 pounds) and can be attributed to an increase in the number of gallons treated and a longer reporting period.

TABLE 4
Summary of Groundwater Analytical Data for July 2013 – Central Groundwater Treatment Plant

| Constituent | Instantaneous Maximum* (µg/L) | Detection Limit (µg/L) | N/C | 16 July 2013 (µg/L) | | | |
|-----------------------------------|-------------------------------------|------------------------------|-----|------------------------|-------------------------------|-------------------------------|--------------------|
| | | | | Influent | After Carbon 1 Effluent | After Carbon 2 Effluent | System Effluent |
| Halogenated Volatile Organics | | | | | | | |
| Carbon Tetrachloride | 0.5 | 0.14 | 0 | ND | ND | ND | ND |
| Chloroform | 5.0 | 0.16 | 0 | ND | ND | ND | ND |
| cis-1,2-Dichloroethene | 5.0 | 0.19 | 0 | 29.2 | ND | ND | ND |
| 1,1-Dichloroethane | 5.0 | 0.5 | 0 | ND | ND | ND | ND |
| 1,2-Dichloroethane | 0.5 | 0.15 | 0 | ND | ND | ND | ND |
| 1,1-Dichloroethene | 5.0 | 0.19 | 0 | 0.68 | ND | ND | ND |
| Methylene Chloride | 5.0 | 0.66 | 0 | ND | ND | ND | ND |
| MTBE | 1.0 | 0.5 | 0 | ND | ND | ND | ND |
| Tetrachloroethene | 5.0 | 0.21 | 0 | 0.84 | ND | ND | ND |
| 1,1,1-Trichloroethane | 5.0 | 0.14 | 0 | ND | ND | ND | ND |
| 1,1,2-Trichloroethane | 5.0 | 0.2 | 0 | ND | ND | ND | ND |
| Trichloroethene | 5.0 | 0.19 | 0 | 228 | ND | ND | ND |
| trans-1,2-Dichloroethene | 5.0 | 0.33 | 0 | 2.2 | ND | ND | ND |
| Vinyl Chloride | 0.5 | 0.18 | 0 | 0.28 J | 0.36 J | ND | ND |
| Non-Halogenated Volatile Organics | | | | | | | |
| Benzene | 1.0 | 0.17 | 0 | ND | ND | ND | ND |
| Ethylbenzene | 5.0 | 0.22 | 0 | ND | ND | ND | ND |
| Toluene | 5.0 | 0.14 | 0 | ND | ND | ND | ND |
| Total Xylenes | 5.0 | 0.23 – 0.5 | 0 | ND | ND | ND | ND |
| Other | | | | | | | |
| Total Dissolved Solids (mg/L) | NA | 10 | 0 | NM | NM | NM | NM |

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

Notes:

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

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

ND = not detected

µg/L = micrograms per liter

mg/L = milligrams per liter

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

| Table 5 – Summary of DP039 Bioreactor “Pulsed Mode” Operations | | |
|---|----------------------------|-----------------------------|
| Location | Pulse On Start Date | Pulse Off Start Date |
| EW782x39 | 20 July 2012 | 3 August 2012 |
| MW750x39 | 5 September 2012 | 16 September 2012 |
| | 28 September 2012 | 13 October 2012 |
| | 29 October 2012 | 9 November 2012 |
| | 21 November 2012 | 7 December 2012 |
| | 21 December 2012 | 4 January 2013 |
| | 18 January 2013 | 4 February 2013 |
| | 15 February 2013 | 1 March 2013 |
| | 15 March 2013 | 29 March 2013 |
| | 12 April 2013 | 26 April 2013* |
| | 10 May 2013 | 24 May 2013 |
| | 7 June 2013 | 21 June 2013 |
| | 15 July 2013 | 26 July 2013 |
| * Damage to the above ground discharge pipe feeding the bioreactor was observed at shutdown. The piping was repaired prior to the 10 May 2013 restart. CGWTP = Central Groundwater Treatment Plant EW = Extraction Well | | |

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

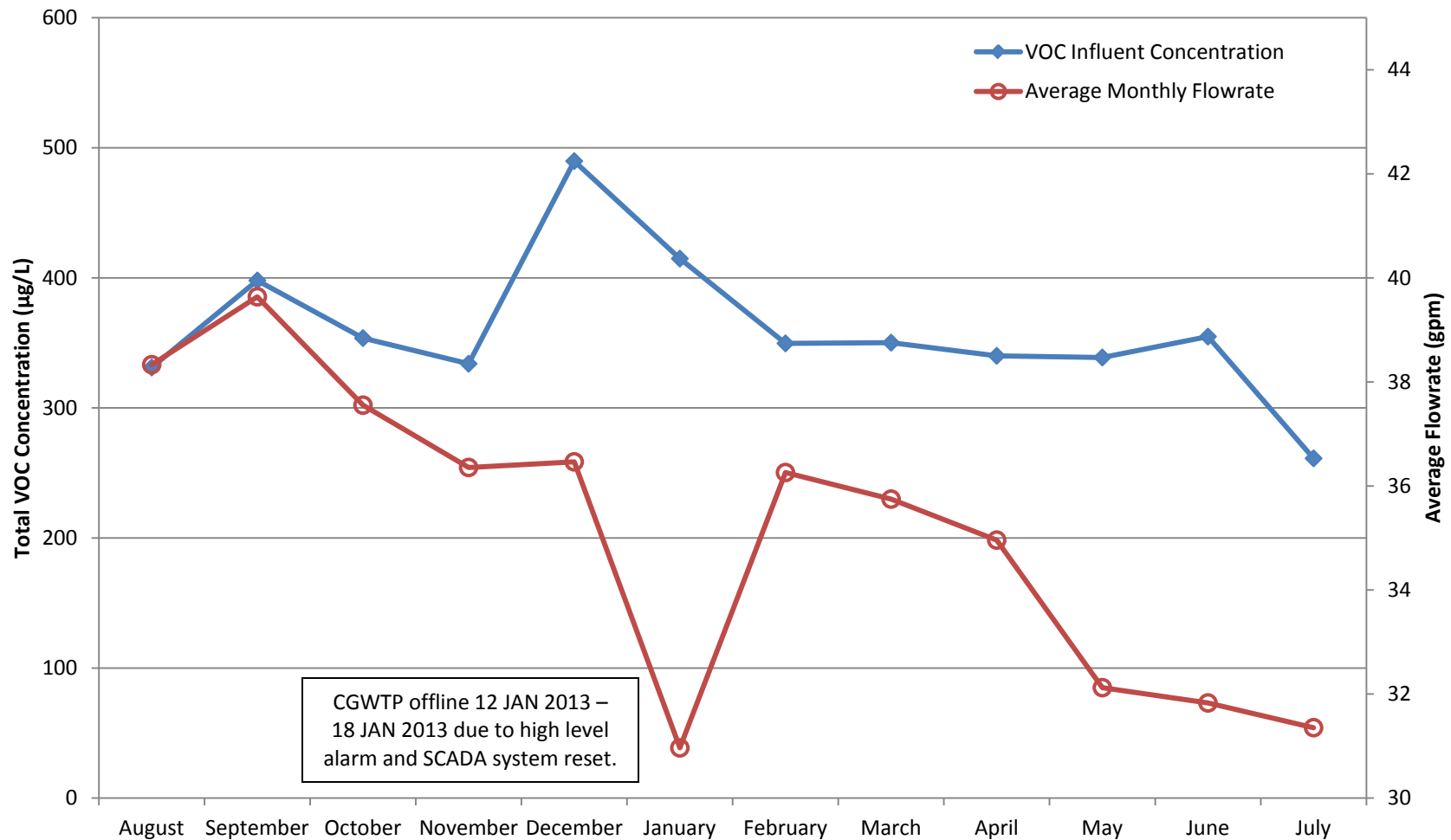
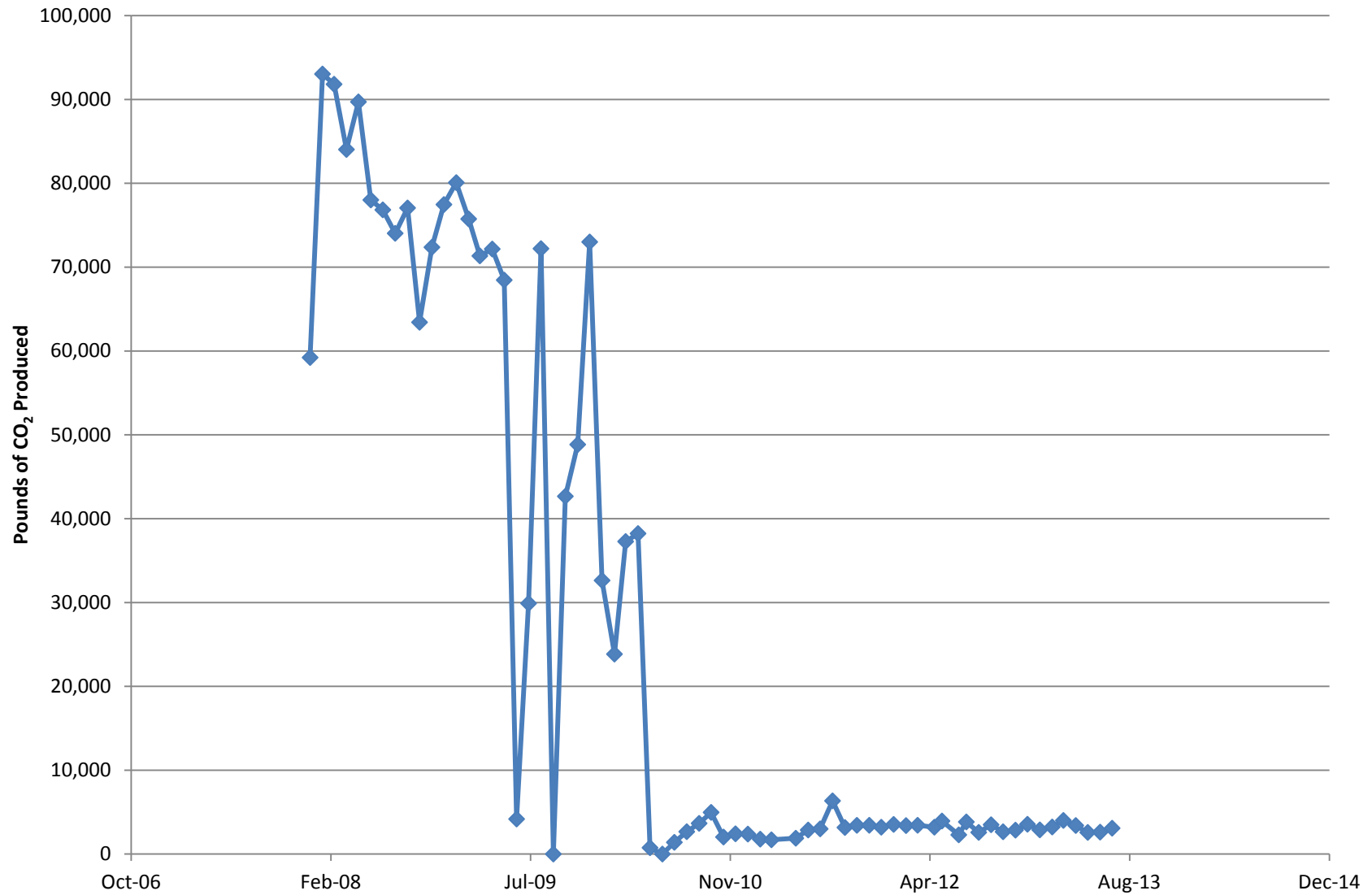


Figure 2

Equivalent Pounds of CO₂ Produced by the Central Groundwater Treatment Plant



North Groundwater Treatment Plant Monthly Data Sheet

Report Number: 133

Reporting Period: 28 June 2013 – 31 July 2013

Date Submitted: 19 August 2013

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

System Metrics

Table 1 presents operational data from the July 2013 reporting period:

| Table 1 – Operations Summary – July 2013 | | | | | |
|--|-----------|------------------|--|-------------------------|---|
| Initial Data Collection: | | 06/28/2013 14:00 | Final Data Collection: | 07/31/2013 17:30 | |
| Operating Time: | | Percent Uptime: | | Electrical Power Usage: | |
| NGWTP: | 796 hours | NGWTP: | 100% | NGWTP: | 536 kWh (734 lbs CO ₂ generated ^a) |
| Gallons Treated: 20,240 gallons | | | Gallons Treated Since March 2000: 82.8 million gallons | | |
| Volume Discharged to Duck Pond: 20,240 gallons | | | Volume Discharge to Storm Drain: 0 gallons | | |
| VOC Mass Removed: 5.2 x 10⁻⁴ pounds^b | | | VOC Mass Removed Since March 2000: 174.3 pounds (Groundwater) | | |
| Rolling 12-Month Cost per Pound of Mass Removed: Not Measured^c | | | | | |
| Monthly Cost per Pound of Mass Removed: Not Measured^d | | | | | |
| ^a Based on Department of Energy estimate that 1 kilowatt hour generated produces 1.37 pounds of GHG. | | | | | |
| ^b VOCs from July 2013 influent sample detected by EPA Method SW8260B. | | | | | |
| ^c Value not calculated since measurement does not accurately represent the cost effectiveness of the system. | | | | | |
| ^d Value not calculated since measurement does not accurately represent the potential effectiveness of the system. O&M costs are low, but very little contaminant mass is being treated. | | | | | |

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

| Table 2 – NGWTP Average and Total Flow Rates – July 2013 | | |
|--|--------------------------------------|-----------------------------------|
| Location | Average Flow Rate (gpm) ^a | Total Gallons Processed (gallons) |
| EW614x07 | 0.13 | 15,180 |
| EW615x07 | 0.05 | 5,870 |
| NGWTP | 0.17 | 20,240 |
| ^a Average flow rate calculated by dividing the total gallons processed collected from wellhead totalizers by the reporting period operating time. The total gallons processed are determined by readings collected at wellhead and system influent totalizers. The discrepancy between the sum of both wells and the NGWTP influent can be attributed to the piping between the wells and the NGWTP, which has to be filled before flow registers at the NGWTP. gpm = gallons per minute | | |

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

| Table 3 – Summary of System Shutdowns | | | | | |
|---|----------|------|---------|------|-------|
| Location | Shutdown | | Restart | | Cause |
| | Date | Time | Date | Time | |
| | None | NA | | | |
| NGWTP = North Groundwater Treatment Plant | | | | | |

Summary of O&M Activities

Analytical data from the 16 July 2013 sampling event are presented in Table 4. Cis-1,2-DCE (0.36 J µg/L) and TCE (2.7 µg/L) were detected at the influent sample location. No contaminant concentrations were measured at the midpoint or effluent sampling locations.

Figure 1 presents a chart of influent concentrations (total VOCs) at the NGWTP versus time for the past twelve (12) months. Analytical data (Table 4) continue to indicate effective treatment of the influent process stream with only two (2) operating GAC drums online. As required by US Fish and Wildlife Service (USFWS), the NGWTP was taken off line (“System Shutdown”) on 30 November 2012 when vernal pools had formed at Site LF007C. The NGWTP resumed operation on 1 May 2013 when the vernal pools no longer contained standing water.

Optimization Activities

No optimization activities were performed during July 2013.

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. The NGWTP is taken off line when vernal pools are filled with water at Site LF007C. The NGWTP used 536 kWh, which calculates to approximately 734 pounds of GHG generation, in July 2013. This is more than June 2013 when the NGWTP produced approximately 575 pounds of GHG. This increase can be attributed to a longer operating period in July 2013. The overall GHG generation remains considerably lower than traditional GWTPs since the system is predominantly powered by solar arrays.

TABLE 4
Summary of Groundwater Analytical Data for July 2013 – North Groundwater Treatment Plant

| Summary of Groundwater Analytical Data for July 2013 - North Groundwater Treatment Plant | | | | | | |
|--|-------------------------------------|------------------------------|-----|------------------------|----------------|----------|
| Constituent | Instantaneous Maximum* (µg/L) | Detection Limit (µg/L) | N/C | 16 July 2013 (µg/L) | | |
| | | | | Influent | After Carbon 1 | Effluent |
| Halogenated Volatile Organics | | | | | | |
| Bromodichloromethane | 5.0 | 0.15 | 0 | ND | ND | ND |
| Bromoform | 5.0 | 0.19 | 0 | ND | ND | ND |
| Carbon Tetrachloride | 0.5 | 0.14 | 0 | ND | ND | ND |
| Chloroform | 5.0 | 0.16 | 0 | ND | ND | ND |
| Dibromochloromethane | 5.0 | 0.13 | 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 | 0.19 | 0 | ND | ND | ND |
| cis-1,2-Dichloroethene | 5.0 | 0.19 | 0 | 0.36 J | ND | ND |
| trans-1,2-Dichloroethene | 5.0 | 0.33 | 0 | ND | ND | ND |
| Methylene Chloride | 5.0 | 0.66 | 0 | ND | ND | ND |
| Tetrachloroethene | 5.0 | 0.21 | 0 | ND | ND | ND |
| 1,1,1-Trichloroethane | 5.0 | 0.14 | 0 | ND | ND | ND |
| 1,1,2-Trichloroethane | 5.0 | 0.2 | 0 | ND | ND | ND |
| Trichloroethene | 5.0 | 0.19 | 0 | 2.7 | ND | ND |
| Vinyl Chloride | 0.5 | 0.18 | 0 | ND | ND | ND |
| Non-Halogenated Volatile Organics | | | | | | |
| Benzene | 1.0 | 0.17 | 0 | ND | ND | ND |
| Ethylbenzene | 5.0 | 0.22 | 0 | ND | ND | ND |
| Toluene | 5.0 | 0.14 | 0 | ND | ND | ND |
| Xylenes | 5.0 | 0.23 – 0.5 | 0 | ND | ND | ND |
| Other | | | | | | |
| Total Petroleum Hydrocarbons – Gasoline | 50 | 8.5 | 0 | NM | NM | ND |
| Total Petroleum Hydrocarbons – Diesel | 50 | 50 | 0 | NM | NM | ND |
| Total Dissolved Solids (mg/L) | NA | 10 | 0 | NM | NM | NM |

* 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

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

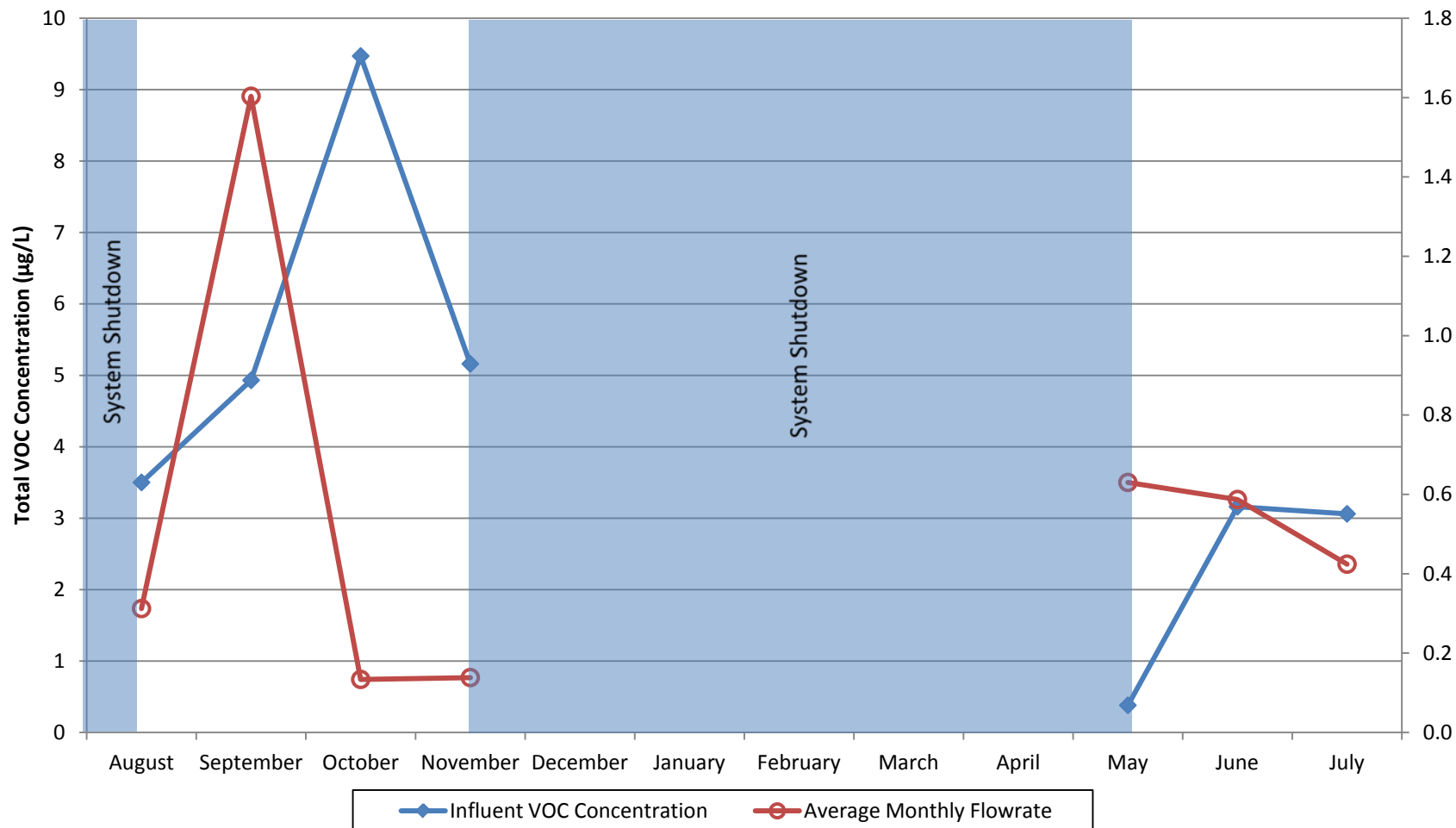
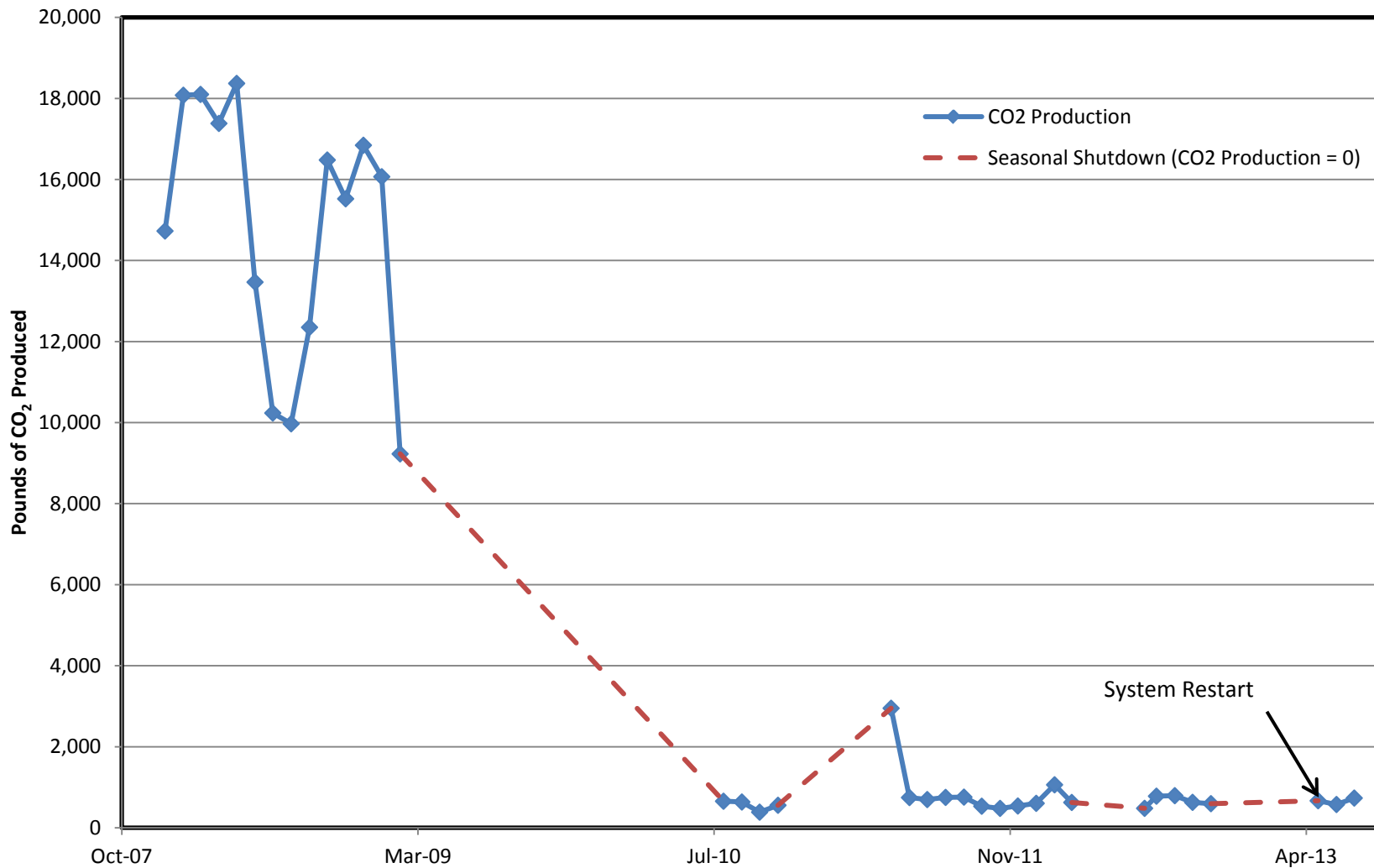


Figure 2
Equivalent Pounds of CO₂ Produced by the North Groundwater Treatment Plant



Note: Dashed line represents seasonal shutdowns due to the presence of vernal pools at Site LF007C during which no CO₂ production occurred.

Site ST018 Groundwater Treatment Plant Monthly Data Sheet

Report Number: 029

Reporting Period: 28 June 2013 – 31 July 2013

Date Submitted: 19 August 2013

This monthly data sheet presents information regarding the Site ST018 Groundwater Treatment Plant (ST18GWTP).

System Metrics

Table 1 presents operation data from the July 2013 reporting period.

| Table 1 – Operations Summary – July 2013 | | | |
|--|--|--|--|
| Initial Data Collection: | | 06/28/2013 09:15 | |
| Final Data Collection: | | 07/31/2013 17:00 | |
| Operating Time: | | Percent Uptime: | |
| ST018GWTP: 730 hours | | ST018GWTP: 91.3% | |
| | | Electrical Power Usage: | |
| | | ST018GWTP: 128 kWh (175 lbs CO ₂ generated ^a) | |
| Gallons Treated: 214.0 thousand gallons | | Gallons Treated Since March 2011: 4.26 million gallons | |
| Volume Discharged to Union Creek: 214.0 thousand gallons | | | |
| BTEX, MTBE, TPH Mass Removed: 0.32 lbs ^b | | BTEX, MTBE, TPH Mass Removed Since March 2011: 24.6 lbs | |
| Rolling 12-Month Cost per Total Pounds of Mass Removed: \$20,616 ^c | | | |
| Monthly Cost per Pound of Mass Removed: \$17,271 | | | |
| ^a Based on Department of Energy estimate that 1 kilowatt hour generated produces 1.37 pounds of GHG. | | | |
| ^b Calculated using July 2013 EPA Method SW8260B analytical results. Influent samples are collected on a quarterly basis. | | | |
| ^c Costs include operations and maintenance, reporting, analytical laboratory, project management, and utility costs related to operation of the system. | | | |
| lbs = pounds | | | |

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

| Table 2 – S18GWTP Average Flow Rates | | |
|--|--|--------------------|
| Location | Average Flow Rate Groundwater (gpm) ^a | Hours of Operation |
| EW2014x18 | 2.22 | 725 |
| EW2016x18 | 1.47 | 725 |
| EW2019x18 | 1.65 | 718 |
| Site ST018 GWTP ^b | 4.88 | 730 |
| ^a Flow rates calculated by dividing total gallons processed by the hours of operation, from the totalizer and hour meter at each location. ^b Treatment system hour meter installed 5 July 2013 and began recording hours at 15:45. Operating time prior to initialization estimated based on notes of field technician. gpm = gallons per minute S18GWTP = Site ST018 Groundwater Treatment Plant | | |

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

| Table 3 – Summary of System Shutdowns | | | | | |
|---|--------------------------|-------|--------------|-------|---|
| Location | Shutdown | | Restart | | Cause |
| | Date | Time | Date | Time | |
| S18GWTP | NA ^a | | 1 July 2013 | 12:00 | Restarted after shut down due to high pressure. |
| S18GWTP | NA ^a | | 5 July 2013 | 15:45 | Restarted after shut down due to high pressure. |
| S18GWTP | 9 July 2013 ^b | 11:12 | 10 July 2013 | 08:45 | Restarted after shut down due to high pressure. |
| ^a Hour meter installed 5 July 2013 to record operating time at the treatment plant. Prior to installation, downtimes estimated to last 24 hours. ^b Shutdown time is estimated based on the difference between the amount of time that passed between consecutive hour meter readings and the hours recorded by the hour meter. S18GWTP = Site ST018 Groundwater Treatment Plant | | | | | |

Summary of O&M Activities

Groundwater samples were collected at the S18GWTP on 17 July 2013. Quarterly influent sample results and monthly midpoint and effluent sample results from the July sampling event are presented in Table 4. Toluene (0.34 J µg/L) and MTBE (1.3 µg/L) were detected at the midpoint sampling location (Carbon 2) in July 2013. No contaminant concentrations were detected at the effluent sampling location.

The total influent concentration (benzene, toluene, ethylbenzene, total xylenes, MTBE, TPH-gas, TPH-diesel, and TPH-motor oil) in the quarterly (3Q13) influent sample was 181 µg/L, which is a decrease from the previous (2Q13) influent concentration of 340 µg/L. This decrease is largely due to TPH-motor oil not being detected in the influent sample this quarter. During 2Q13, the influent concentration of TPH-motor oil was 180 J µg/L. The influent concentration for MTBE during 3Q13 was 131 µg/L. This is a slight decrease from the 2Q13 influent concentration for MTBE of 155 µg/L. Figure 1 presents a plot of influent quarterly total VOC (TPHg, TPHd, MTBE, and BTEX) and MTBE concentrations at the S18GWTP versus time.

An hour meter was installed to record the operating time of the treatment system on 5 July 2013. This hour meter installation will allow for more accurate accounting of treatment system runtime. It will also allow the source of shutdowns at the system and individual extraction wells to be more easily identified.

The sump pump at the ST018GWTP began to malfunction in July. Motor lubricant from the pump was observed to have leaked into the sump. Standing water in the sump was bailed into the influent tank, but the sump pump continued to cycle. Troubleshooting revealed that the air/vacuum valves installed on each carbon vessel were leaking causing the sump pump to cycle more frequently. Further troubleshooting will be performed in August 2013 to repair the leaking air/vacuum valves and determine if the valves and/or the sump pump will require replacement.

Optimization Activities

On 5 July 2013 the trip point for the pressure switch on the treatment system was increased from 25 to 35 pounds per square inch (psi). Increasing the trip point should reduce downtimes associated with pressure building in the granular activated carbon vessels, which are prone to sedimentation due to the nature of the soils at Site ST018. Increased runtime of the treatment system was observed in July 2013 and approximately three times the number of gallons were processed this month as compared to the previous reporting period.

Sustainability

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

The S18GWTP produced approximately 175 pounds of GHG during this reporting period. This is an increase from June 2013 (77 pounds) resulting from increased operating time and greater gallons treated during the reporting period. Figure 2 presents the historical GHG production from the S18GWTP. The overall GHG generation remains considerably lower than traditional GWTPs since the system is predominantly powered by solar arrays.

TABLE 4

Summary of Groundwater Analytical Data for July 2013 – Site ST018 Groundwater Treatment Plant

| Summary of Groundwater Analytical Data for July 2013 - Site 07010 Groundwater Treatment Plant | | | | | | | |
|---|---|------------------------------|-----|------------------------|----------------|----------------|-----------------|
| Constituent | Instantaneous Maximum ^a (µg/L) | Detection Limit (µg/L) | N/C | 17 July 2013 (µg/L) | | | |
| | | | | Influent ^b | After Carbon 1 | After Carbon 2 | System Effluent |
| Fuel Related Constituents | | | | | | | |
| MTBE | 5 | 0.5 | 0 | 131 | NM | 1.3 | ND |
| Benzene | 5 | 0.17 | 0 | 1.1 | NM | ND | ND |
| Ethylbenzene | 5 | 0.22 | 0 | 0.55 | NM | ND | ND |
| Toluene | 5 | 0.14 | 0 | ND | NM | 0.34 J | ND |
| Total Xylenes | 5 | 0.23 – 0.5 | 0 | 0.43 J | NM | ND | ND |
| Total Petroleum Hydrocarbons – Gasoline | 50 | 8.5 | 0 | 48 J | ND | NM | ND |
| Total Petroleum Hydrocarbons – Diesel | 50 | 50 | 0 | ND | ND | NM | ND |
| Total Petroleum Hydrocarbons – Motor Oil | -- | 160 | -- | ND | ND | NM | ND |

^a In accordance with the National Pollutant Discharge Elimination System (NPDES) Effluent Limitations^b Values taken from July 2013 (3Q13) sample data. Influent sampling is conducted on a quarterly basis.

µg/L = micrograms per liter

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

ND = not detected above method detection limit

NM = not measured this month

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

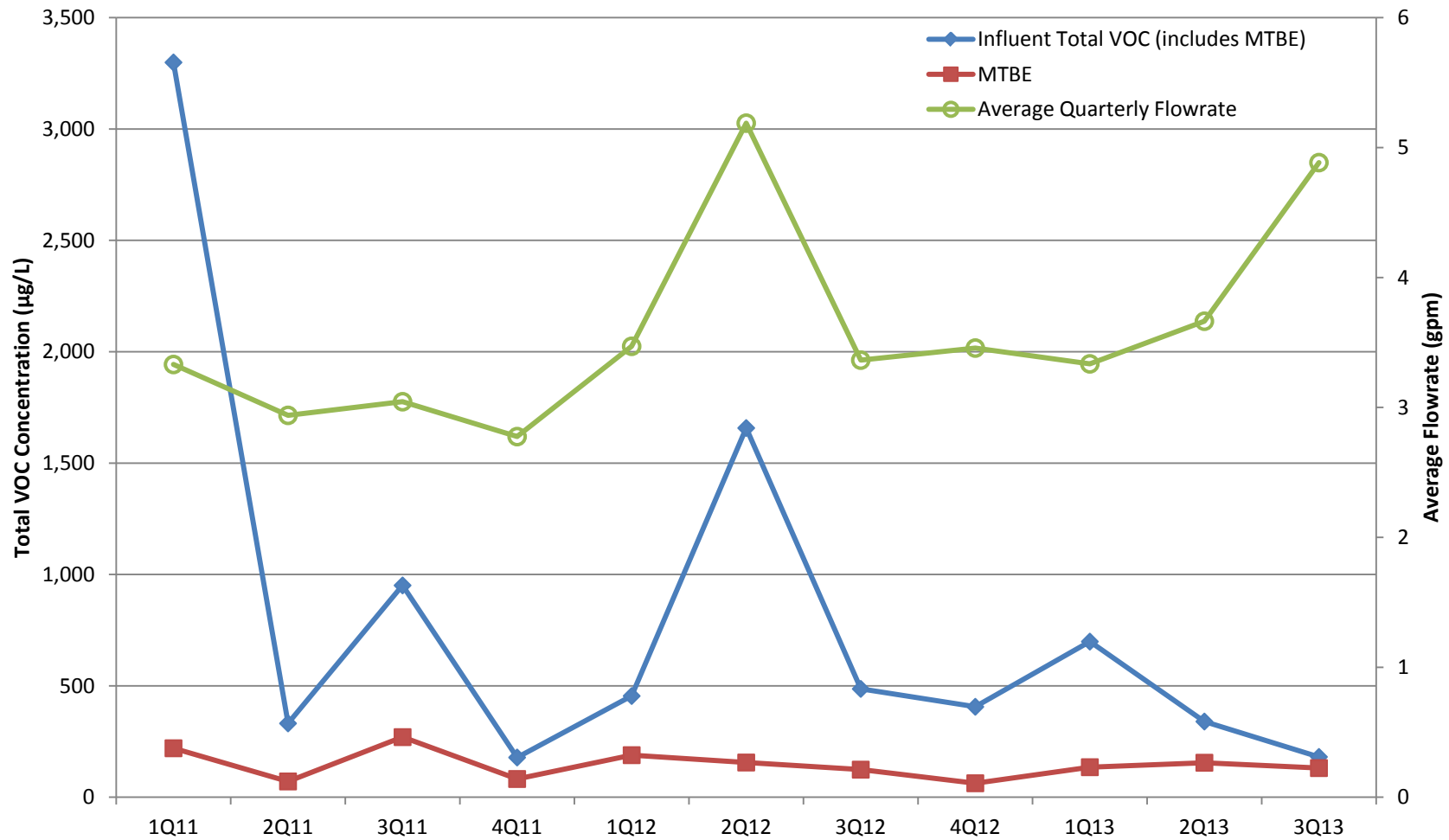
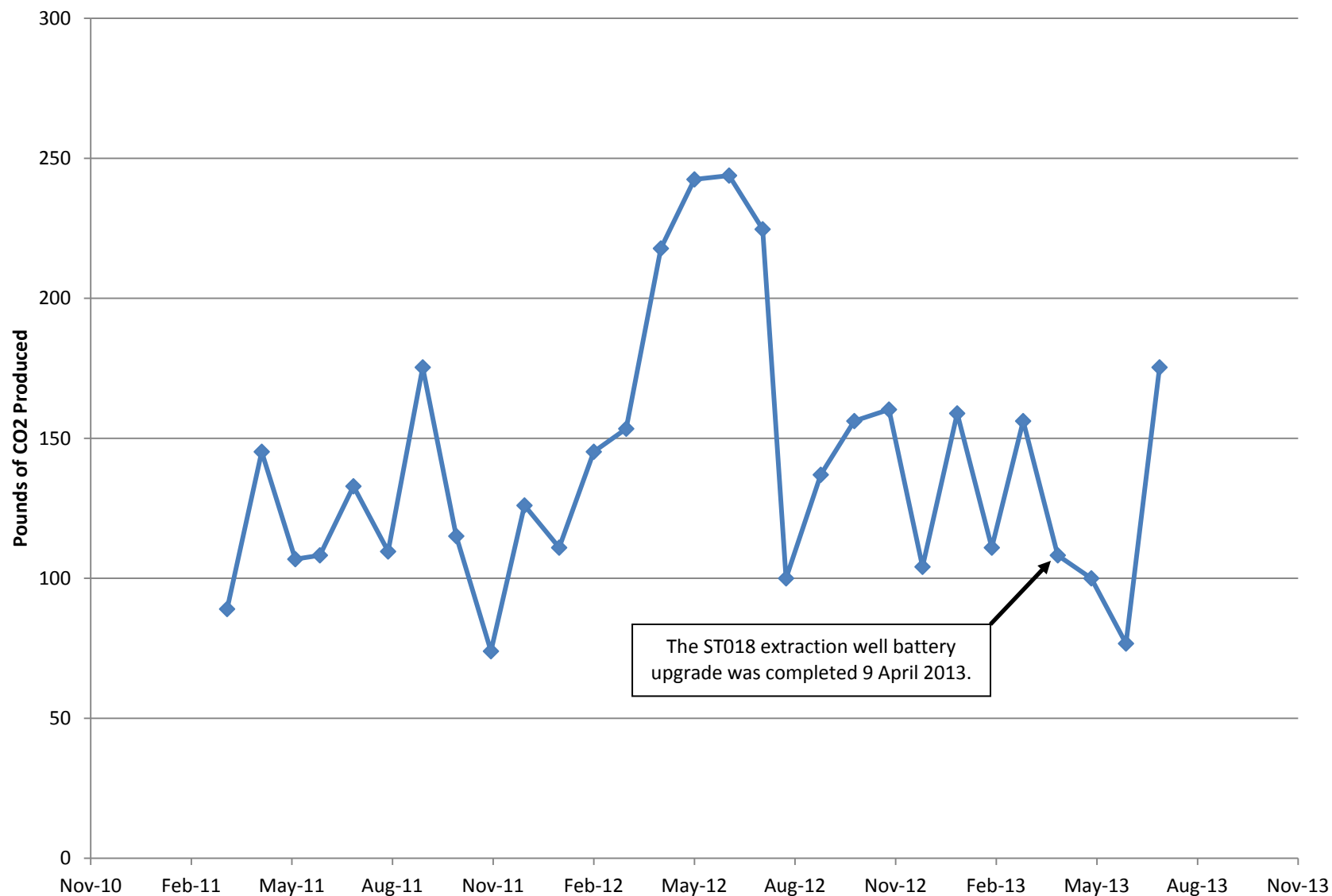


Figure 2
Equivalent Pounds of CO2 Produced by the Site ST018 Groundwater Treatment Plant



The ST018 extraction well battery upgrade was completed 9 April 2013.

Subarea LF007C and Site SS030 Remedial Process Optimization Work Plan

RPM Meeting
August 21, 2013

Agenda

- Summary of Subarea LF007C Objectives and Investigation Activities
- Subarea LF007C Investigations
 - Groundwater Elevation Survey
 - Monitoring Well Installation and Temporary Piezometer Abandonments
 - 72-hour Groundwater Pump Test
 - Groundwater Modeling
- Site SS030 Background
- Subarea LF007C GETS Optimization
 - Replace pumps, solar panels, and conveyance line
- Site SS030 GETS Optimization
 - Install new extraction well and associated conveyance line

Subarea LF007C Objectives

- Delineate horizontal and vertical off-base extent of VOC plume.
- Evaluate hydraulic connection of vernal pool with the underlying groundwater.
- Evaluate VOC plume capture scenarios.

Subarea LF007C Previous Investigations

- Installed 9 temporary piezometers and 4 monitoring wells at Subarea LF007C in October and November 2011 to delineate the off-base portion of the TCE plume.
- A groundwater elevation survey conducted with the LF007C extraction wells off in November 2011: identified a groundwater trough beneath the TCE plume.
- Review of the lithologic logs of LF007C: identified a bedrock depression in the subsurface beneath the TCE plume.

Subarea LF007C Previous Investigations (continued)

- Performed limited pump tests at the two extraction wells on December 30, 2011.
- Conducted groundwater modeling for pumping rates needed to achieve plume capture.
 - Combined extraction rate of 10 gpm for both extraction wells.
- Results of investigations
 - Need to delineate southwestern portion of TCE plume.
 - Need to evaluate if existing extraction wells can achieve plume capture.

Follow-on Investigations

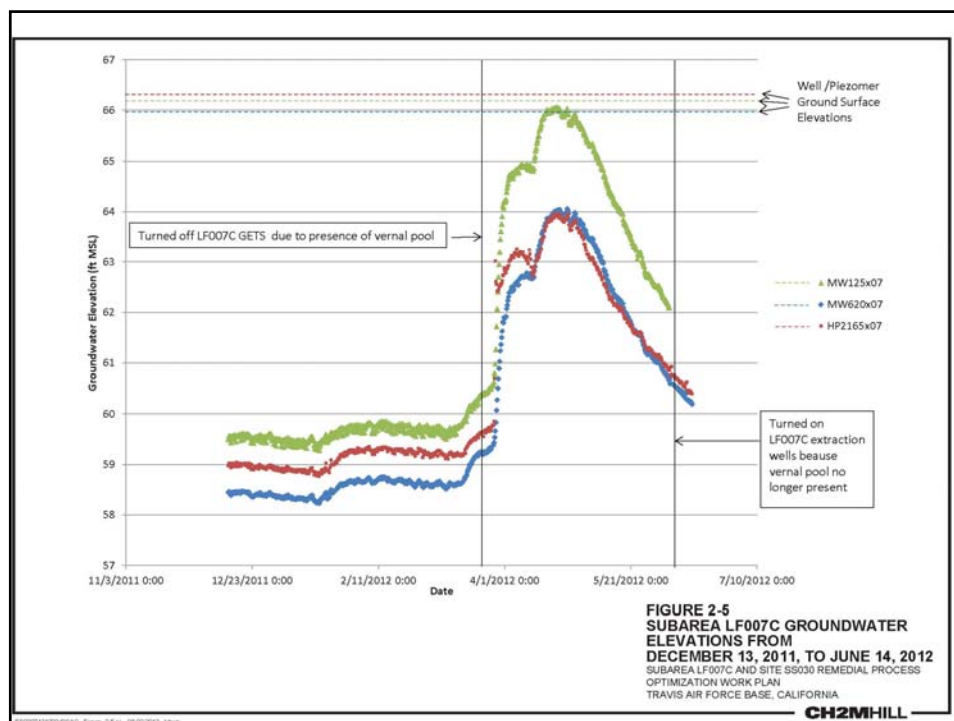
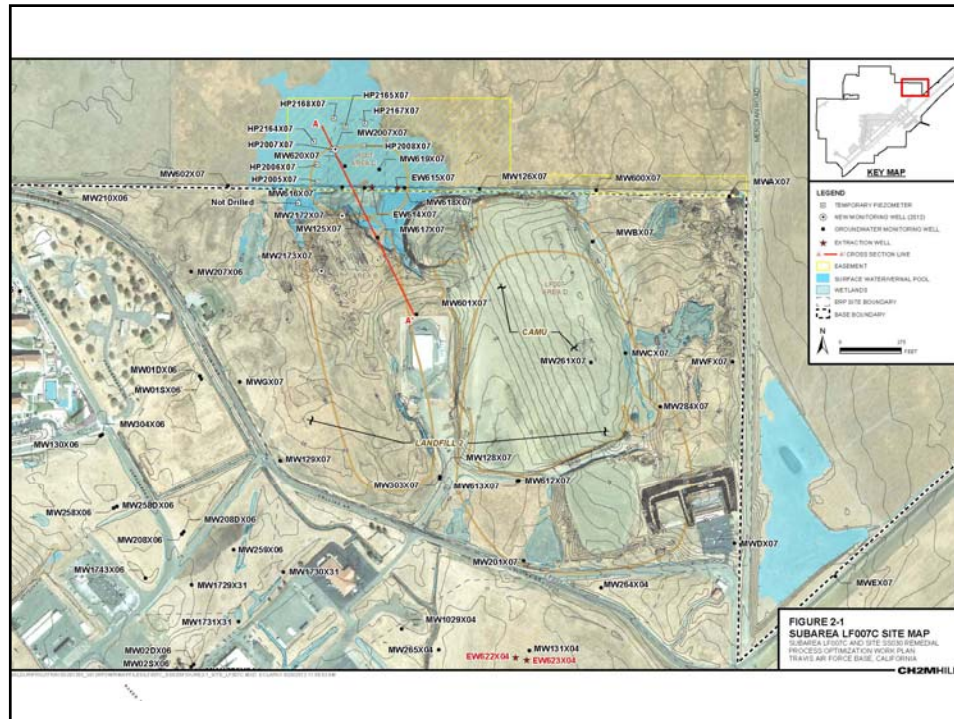
- Conduct continuous groundwater elevation survey from December 2011 to June 2012 using transducers to evaluate hydraulic connection between groundwater and the vernal pool.
- Install 2 monitoring wells, convert 1 temporary piezometer into a monitoring well, and abandon 8 temporary piezometers.
- Conduct groundwater elevation survey with extraction wells pumping to evaluate if off-base portion of the TCE plume is captured.

Follow-on Investigations (Continued)

- Perform 72 hour pump test at extraction wells EW614x07 and EW615x07.
- Model groundwater capture with the maximum sustained pumping rates for the two extraction wells determined from 72 hour pump test.

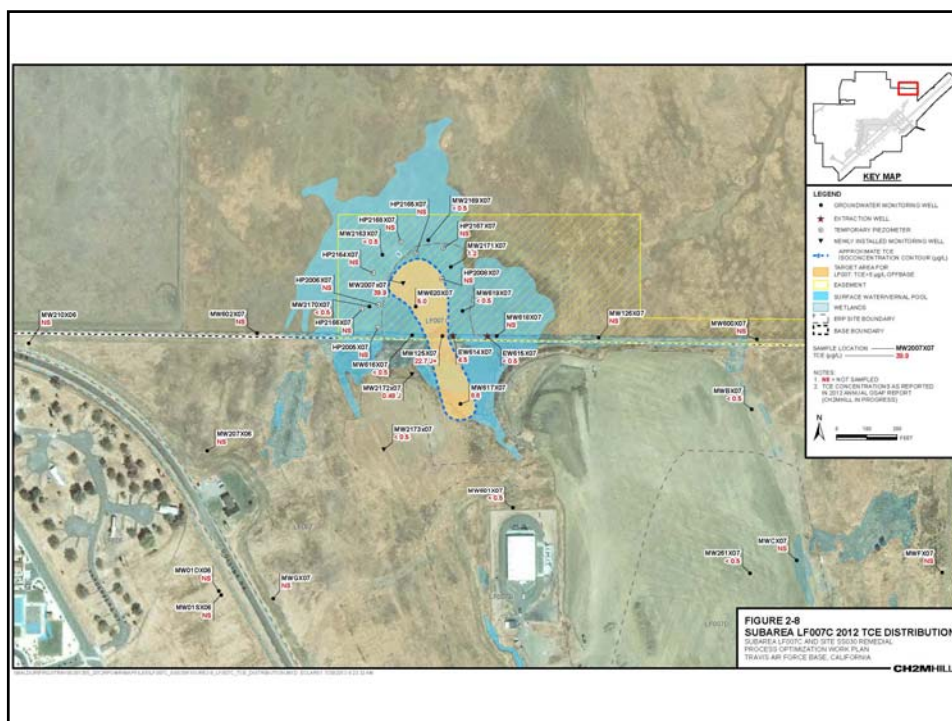
Winter 2011-2012 Groundwater Elevation Survey

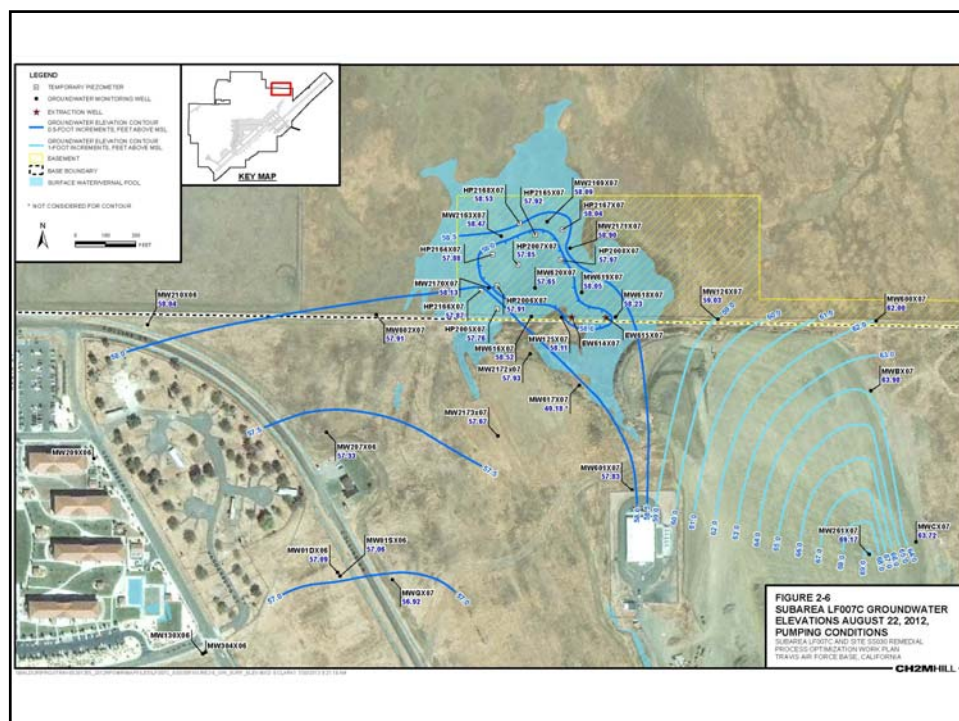
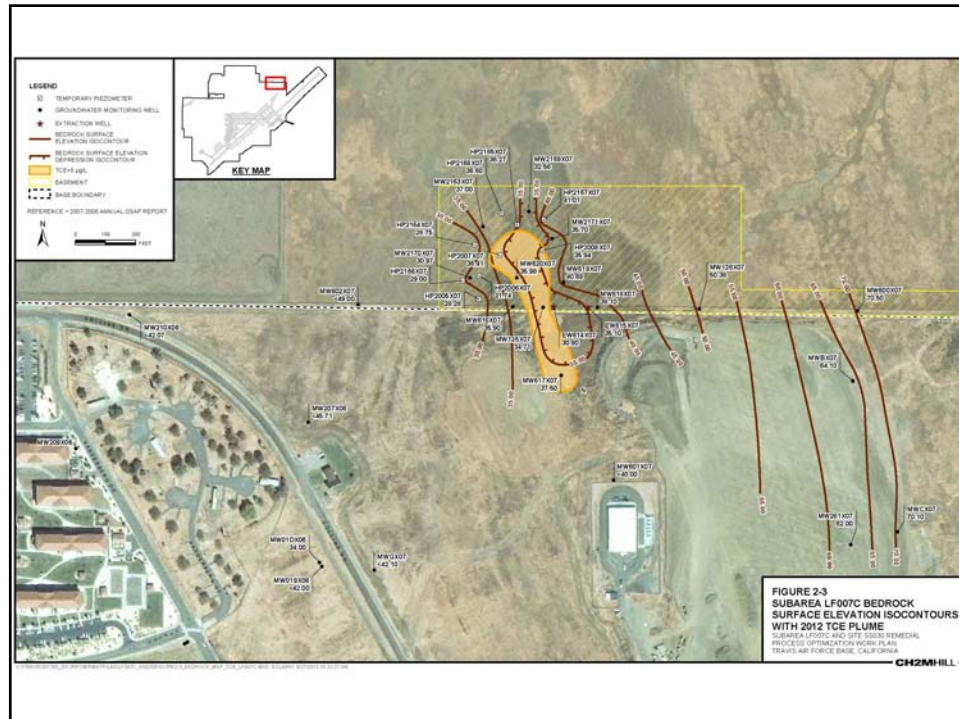
- Conducted continuous groundwater elevation survey at 3 monitoring wells from December 2011 to June 2012 using transducers to evaluate the connection between the vernal pool and the groundwater aquifer.
- The study results indicate the vernal pool appears to be connected hydraulically to the groundwater aquifer.



Monitoring Well Installations and Temporary Piezometer Abandonments

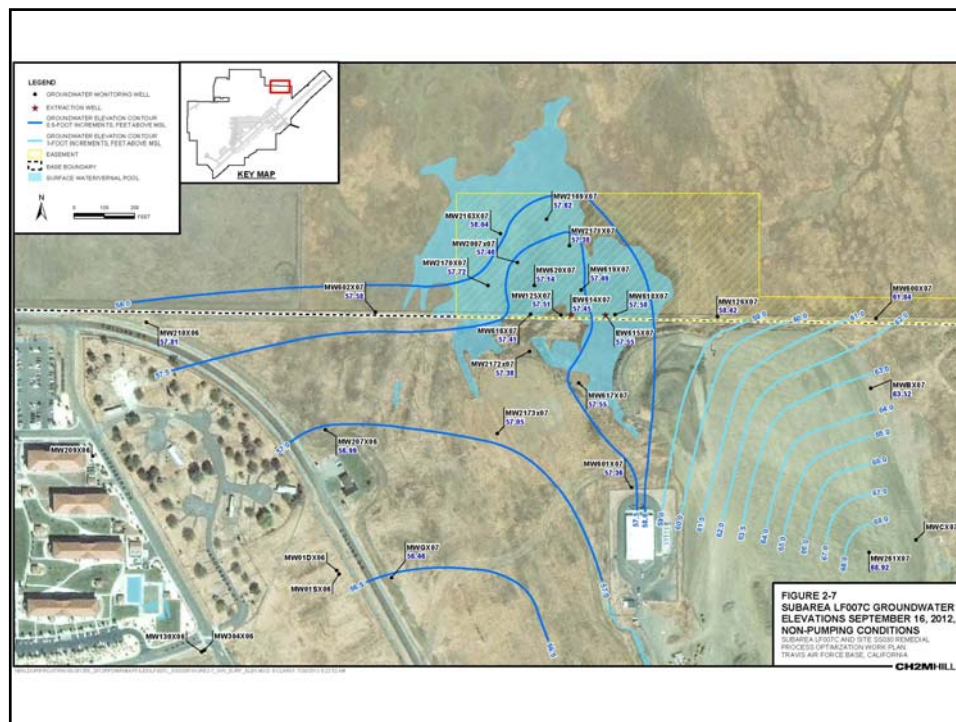
- Installed 2 new monitoring wells to delineate the southwestern portion of the TCE groundwater plume.
- Converted temporary piezometer (in the vernal pool: HP2007x07) into monitoring well MW2007x07 to monitor the highest concentration of off-base portion of the TCE plume.
- Abandoned 8 temporary piezometers as required by the USFWS Biological Opinion from August 22 to 24, 2012.
- Conducted groundwater elevation survey on August 22, 2012 with extraction well EW614x07 pumping to determine if the off-base portion of the TCE plume is captured.
 - Groundwater depression within the TCE plume.

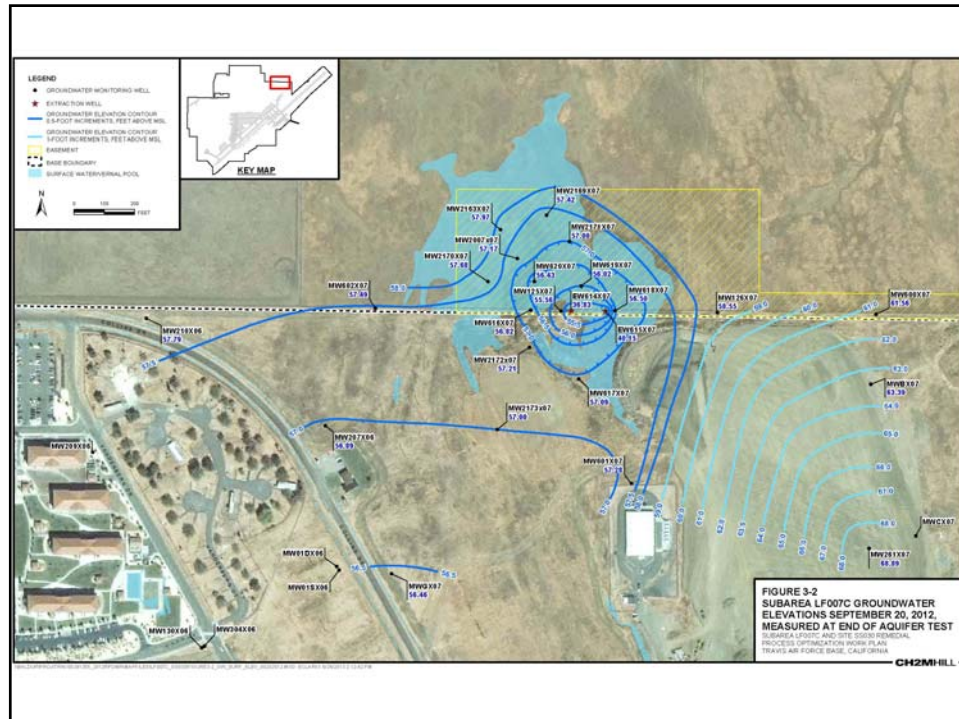




72-Hour Groundwater Pump Test

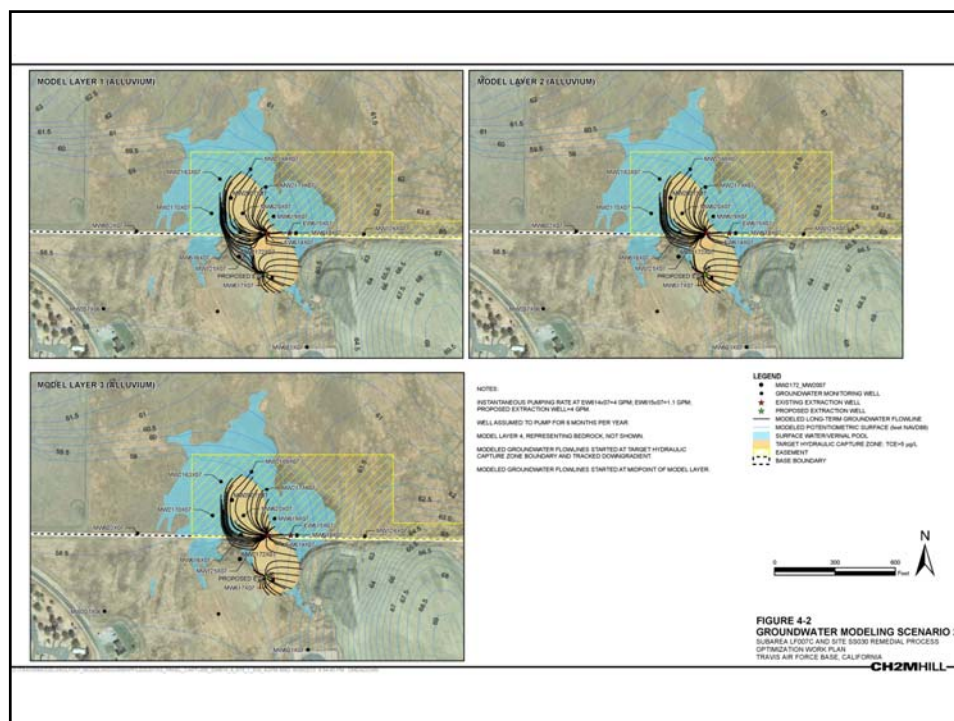
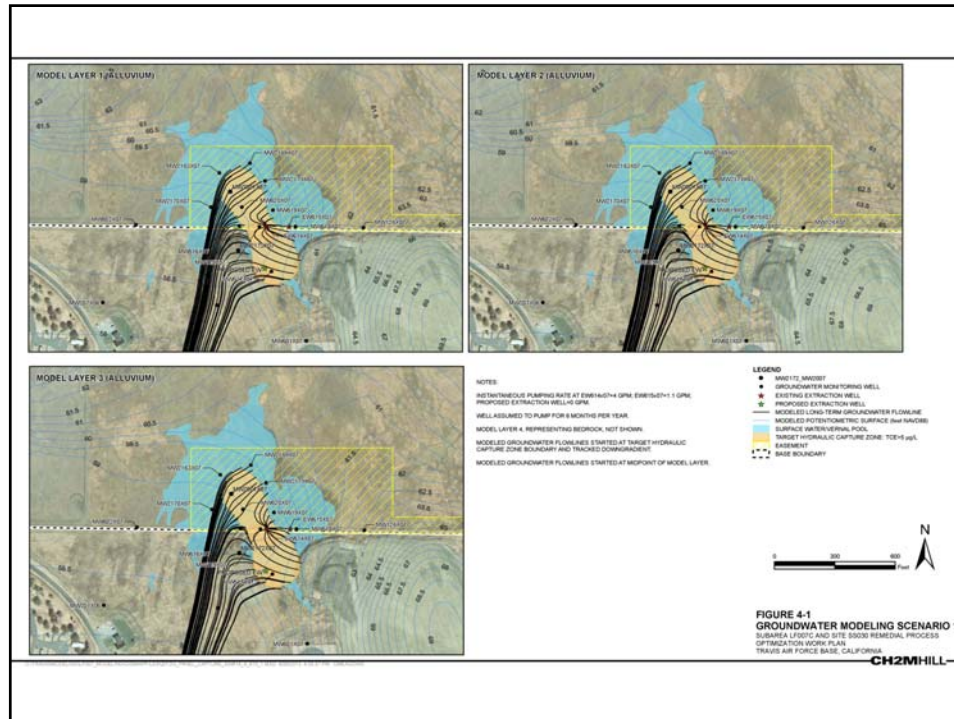
- Conducted 72 hour groundwater pump test in September 2012.
- Baseline groundwater elevation survey with the two extraction wells off showed a groundwater trough beneath the TCE plume.
- The pump test showed maximum sustained pumping rates of 4.7 and 2.5 gpm at EW614x07 and EW615x07.





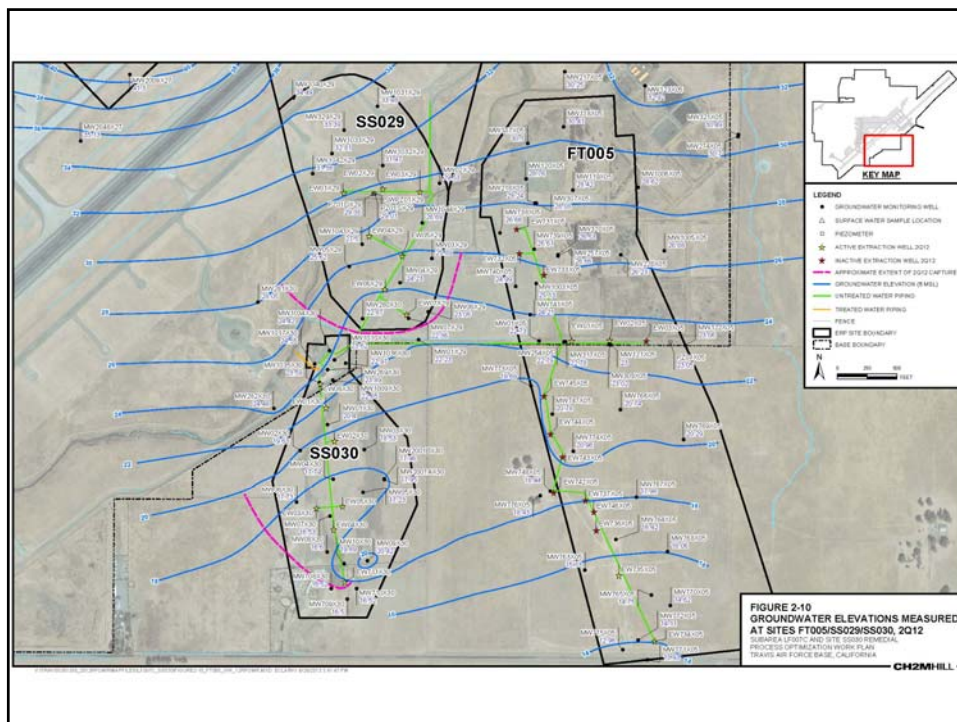
Groundwater Modeling

- Two groundwater pumping scenarios modeled.
- Groundwater pumping at 4 gpm in EW614x07 and 1.1 gpm in EW615x07 for 6 months per year does not appear to achieve plume capture.
- Groundwater pumping at 4 gpm in EW614x07, 1.1 gpm in EW615x07, and 4 gpm in a new on-base extraction appears to achieve capture.
- Plan is to optimize LF007C in 2 Phases
 - Phase 1 - Optimize extraction well EW614x07 and observe for 1 year to see if capture is obtained.
 - Phase 2 - Install new on-base extraction well if capture is not obtained.



Site SS030 Background

- Existing Site SS030 GETS has obtained capture of TCE plume and is reducing the plume.
- Groundwater in the western and central portion of the plume has been remediated.
- Highest concentrations of remaining TCE are located east of existing extraction wells.
 - 250 feet east of the nearest extraction well.
- Installing an extraction well within the remaining TCE plume will significantly improve the efficiency of the SS030 GETS.



Subarea LF007C GETS Optimization

LOCATION OF PAD WITH TREATMENT EQUIPMENT

NEW TIE-IN POINT TO EXISTING DISCHARGE PIPING

NEW CONVEYANCE AND DISCHARGE PIPING

LOCATION OF NEW SOLAR PANELS AND BATTERY BANK (S)

LOCATION OF PHASE 2 EXTRACTION WELL

BYPASS EXISTING SECTIONS OF CONVEYANCE AND DISCHARGE PIPING

SD031

FT004

LF007

KEY MAP

LEGEND

- PROPOSED EXTRACTION WELL
- NEW CONVEYANCE AND DISCHARGE PIPING
- EXISTING CONVEYANCE AND DISCHARGE PIPING
- FENCE
- SURFACE WATER
- CANAL BOUNDARY
- APPROXIMATE GROUNDWATER FLOW DIRECTION
- MAIN WATERLINE
- UTILITY BOUNDARY
- SDP SITE BOUNDARY
- BASE BOUNDARY

0 100 200 FEET

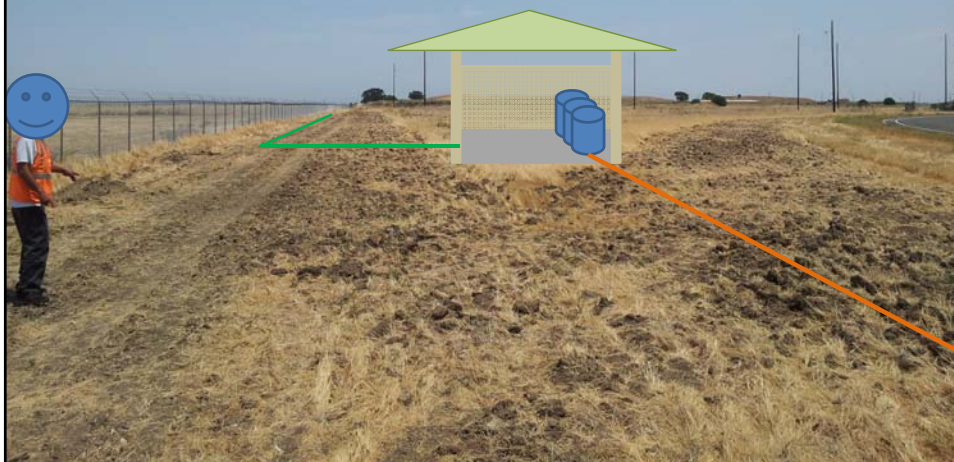
FIGURE 3-1
SUBAREA LF007C NEW EXTRACTION WELL LOCATION AND DETAILS
SUBAREA LF007C NEW EXTRACTION WELL LOCATION AND DETAILS
PROCESS OPTIMIZATION WORK PLAN
TRANS AND FORCE MAIN, CALIFORNIA

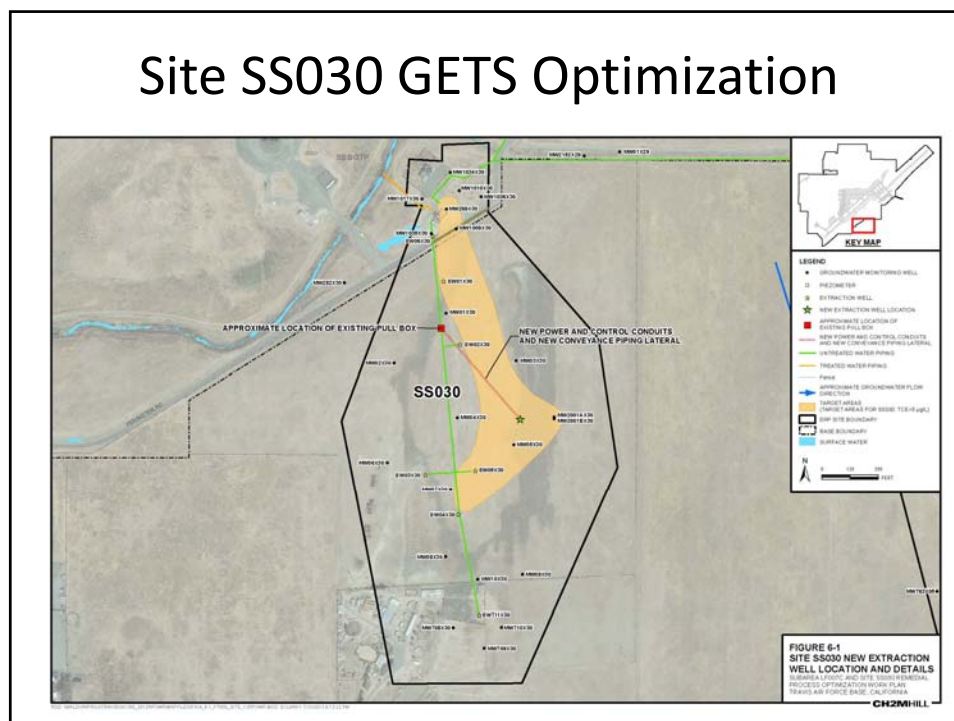
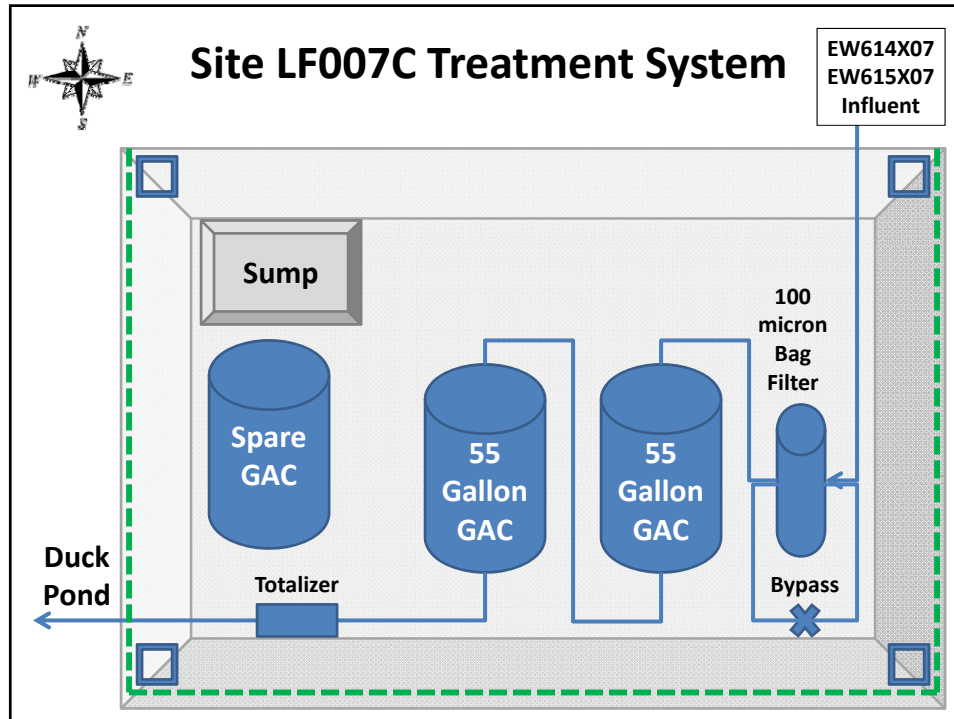
CH2M HILL

- Upgrade the pump and solar panel at extraction well EW614x07 to maximize pumping capacity.
- Install an additional extraction well at Subarea LF007C after 1 year of operation if capture has not be obtained.



- Relocate the treatment facility for Subarea LF007C to reduce the pumping distance and maximize flow.
- The new treatment facility will tie in to the existing Duck Pond conveyance line.



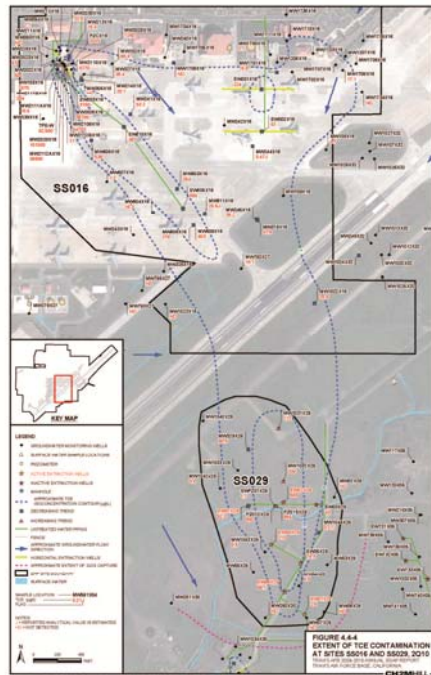


Pre-Design Site Characterization Report

SS016 and SS029 South Base Boundary
Groundwater Treatment Plant
Travis AFB, California

Overview

- Background
- Field Implementation
- Results



Background

- SS016 and SS029 TCE and cis-1,2-DCE Plumes Starting to Commingle
- Investigation for Data Gaps for evaluation of post-ROD potential Remedial Process Optimization for SS016 and SS029 Groundwater Plumes
- Focus on SS029 leading edge of groundwater plume

Background

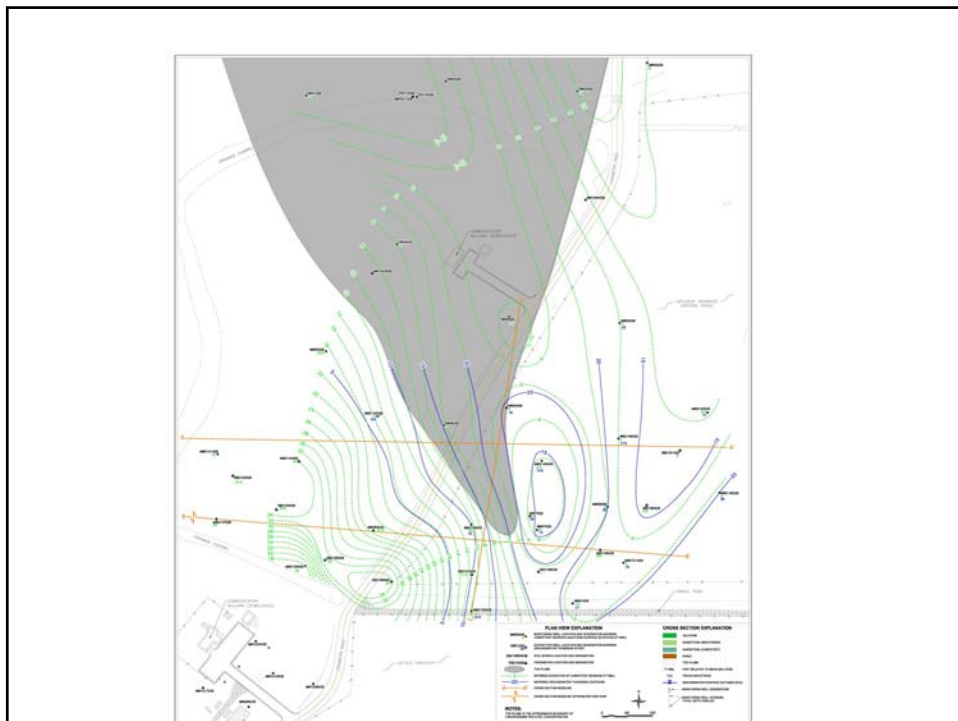
- Final Work Plan (September 2012)
 - Interim approval in July 2012
 - Proposed 12 Groundwater Wells
 - Proposed 9 Soil Borings (Identify competent bedrock)
 - Chemical, Physical, Microbiological Testing
 - Bench-Scale Column Testing
 - Aquifer Testing
 - Initial Groundwater Modeling Conducted
 - Revision of Initial Groundwater Modeling based on investigation

Field Implementation

- 10 Groundwater Wells Installed (July 2012)
 - Final depths between 18 to 30 feet
 - 2 well locations did not yield water (not completed)
 - Bedrock was encountered at 6-8 feet below ground surface
 - Wells developed in August 2012
- 9 Soil Borings (July 2012)
 - Bedrock encountered between 6-8 feet toward west
 - Bedrock encountered between 29-39 at other locations

Results

- Groundwater samples for chlorinated solvents similar to current groundwater samples in area
- Groundwater well boring logs, soil boring logs and historical boring logs used to map competent bedrock
 - Ridge present along western edge may affect groundwater flow
- Microbiological testing indicates limited detection of *dehalococcoides spp.* but low chlorinated solvent mass and aerobic conditions at leading edge of SS029 not conducive to dehalogenation.
- Column testing using spiked groundwater yielded effective degradation for ZVI and biological treatment to MCLs



Results (Continued)

- Revised Groundwater Modeling incorporated:
 - Soil physical testing results
 - Boring logs
 - Aquifer testing
- Revised groundwater modeling under various scenarios indicates similar groundwater flow as currently observed with slight widening at leading edge.
- Data generated and evaluation may be used post-ROD to evaluate potential remedial process optimization

Report Review

- Contract Period of Performance ends October 31, 2013
- Require comments/questions by September 21, 2013

Travis AFB Restoration Program

Program Overview

RPM Meeting
August 21, 2013

Completed Documents

- 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 (cont'd)

- Phytostabilization Study Report
- 2009/2010 Annual GSAP Report
- SS015 Remedy Optimization Field Implementation Plan
- Sites SS014 and ST032 Tier 1 POCO Evaluation Report
- SD036 Remedy Optimization Field Implementation Plan
- 2010 Annual CAMU Inspection Report
- Site ST018 POCO Baseline Implementation Report
- FT005 Data Gaps Investigation Report
- Comprehensive Site Evaluation Phase II Report
- 2010 Groundwater RPO Annual Report
- Focused Feasibility Study (FFS)
- Site ST027-Area B Human Health Risk Assessment
- Site ST027-Area B Ecological Risk Assessment
- Work Plan for Assessment of Aerobic Chlorinated Cometabolism Enzymes
- 2010/2011 Annual GSAP Report
- Baseline Implementation Report (Sites SS015, SS016, SD036, SD037, and DP039)
- 2011 CAMU Annual Report
- Technical and Economic Feasibility Analysis (TEFA)
- Work Plan for RPO of Sites SS016 and SS029
- Site LF007C Data Gaps Investigation Technical Memorandum
- Technical Memorandum for Assessment of Aerobic Chlorinated Cometabolism Enzymes
- Old Skeet Range Engineering Evaluation/Cost Analysis
- 2011 Groundwater Treatment RPO Annual Report
- Groundwater Proposed Plan (PP)
- FT005 Remedial Action Completion Report
- 2012 GSAP Technical Memorandum

Completed Documents (cont'd)

- Vapor Intrusion Assessment Update
Technical Memorandum
- ***2012 CAMU Annual Report***

Completed Field Work

- ST027B Gore Sorber Survey–Phase 1
- ST027B Field Sampling – Phase 2
- GSAP 2008 Semi-annual Event
- ST027B Installation of Wells – Phase 3
- SS014 Site Characterization
- LF008 Rebound Study
- GSAP Annual Sampling Event - 2009
- SS030 Site Characterization–Phase 1
- ST027 Site Characterization -Phase 3
- ST014 Monitor Well Install - Subsite 3
- SD001/SD033 Sediment RA
- SS016 Site Characterization (OSA source area)
- ST018 Site Characterization
- SS030 Site Characterization (Off-base VOC Plume)
- DP039 Site Characterization (for Biobarrier Placement)
- SS014 & ST032 Q1 2010 MNA Sampling (2nd of 4 quarterly events)
- SD036 Additional Site Characterization (north & east)
- Therm/Ox System Removal
- SS016 Monitoring Well Installation
- SD037 EVO Injection Well Installation
- DP039 Monitoring Well & Injection Well Installation
- DP039 EVO Injection
- SD037 Monitoring Well Installation
- GSAP 2010 Annual Sampling Event
- SD037 EVO Injection
- SS015 Site Characterization
- South Plant GAC Change-out
- FT005 Data Gap Investigation
- SS016 Position Survey of EW03
- SS016 Bioreactor Installation
- SS016 Bioreactor Baseline Sampling
- DP039 Biobarrier Quarterly Performance Sampling

Completed Field Work (cont'd)

- 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

Completed Field Work (cont'd)

- 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)

In-Progress Documents & Field Work

Documents

- Groundwater Record of Decision (ROD)
- 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***

Field Work

- Electrical repairs to Site SS029 extraction system
- Pump repairs to Site SS016 well (EW610x16)

Upcoming Documents & Field Work

Documents

- Kinder Morgan LF044 Land Use Control Report TBD

Field Work

- Subsite LF007C optimization upgrades
- Site SS030 optimization upgrades
- Site ST018 carbon vessels upgrades
- SCADA upgrade for CGWTP & SBBGWTP
- Wellhead Maintenance

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