Final

Travis Air Force Base
Environmental Management
Building 570, Travis AFB, California
Environmental Restoration Program
Remedial Program Managers
Meeting Minutes

22 October 2008, 0930 Hours

Mr. Mark Smith, Travis Air Force Base (AFB), conducted the Remedial Program Manager's (RPM) meeting on 22 October 2008 at 0930 in the Environmental Flight Conference Room, Building 570, Travis AFB, California. Attendees included:

• Mark Smith	Travis AFB
• Lonnie Duke	Travis AFB
• Greg Parrott	Travis AFB
• Glenn Anderson	Travis AFB
• Mary Snow	TechLaw
• James Chang	U.S. Environmental Protection Agency (USEPA)
• Alan Friedman	California Regional Water Quality Control Board (CRWQCB)
• Jose Salcedo	Department of Toxic Substances Control (DTSC)
• Dave Cooper	U.S. Environmental Protection Agency (USEPA)
• Rich Freitas	U.S. Environmental Protection Agency (USEPA)
• Kimberly Witt	USACE, Omaha District
• Jennifer Musilek	USACE, Omaha District
• Mike Wray	CH2M Hill
• Chuck Elliott	CH2M Hill
• Gavan Heinrich	CH2M Hill
• Rachel Hess	Innovative Technical Solutions, Inc. (ITSI)

Handouts distributed at the meeting and presentations included:

• Attachment 1	Meeting Agenda
• Attachment 2	Master Meeting, Teleconference, and Document Schedules
• Attachment 3	SBBGWTP Monthly Data Sheet (September 2008)
• Attachment 4	CGWTP Monthly Data Sheet (September 2008)
• Attachment 5	NGWTP Monthly Data Sheet (September 2008)
• Attachment 6	Triad Approach
• Attachment 7	Site ST027
• Attachment 8	LF008 Rebound

1. ADMINISTRATIVE

A. Previous Meeting Minutes

The 24 September 2008 RPM meeting minutes were approved and finalized with no change.

B. Action Item Review

None.

C. Meeting Dates and Master Document Schedule Review

The Travis AFB Master Meeting, Teleconference, and Document Schedules were discussed during this meeting (see Attachment 2). Mr. Smith noted major changes have been made in the document schedule. Attempts are being made to stagger the documents for agency review.

Travis AFB Annual Meeting and Teleconference Schedule

— The next RPM meeting will be 10 December at Travis; the teleconference will be 10 November.

Travis AFB Master Document Schedule

— Basewide, GW ROD: No changes. The Action Plan is a more detailed description of the technical proposal from CH2M Hill; based on review of that document, it will be the foundation for the ROD and schedule.

— Potrero Hill Annex ROD: No change.

— LF007C Work Plan: Added to schedule. This has an off-base component also.

— QAPP Update: Take existing RD/RA QAPP and update to the latest methods and technologies. Last written in 1999/2000. It will be used to support all groundwater field work.

— HSP Update: Will be updated based on the current workload. The changes are minor.

— Guardian quarterly newsletter: Published every quarter; next one is in January 2009.

— Bioreactor Work Plan: Not in schedule. Emailed to the agencies this morning. Requesting comments in one week from the agencies. The report isn't long but rather to the point. The construction and rebound are currently in progress, and will probably go through November, before the rain season begins.

2. CURRENT PROJECTS

A. Public Affairs

Mr. Cooper presented comments on TAFB handling of public affairs. He has received and reviewed the draft of the quarterly newsletter (Guardian). He noted that the RAB meets semi-annually and the importance of the Guardian to keep the community involved and informed. The Guardian should continue to be used as a principal means for the public to keep up with what is going on at the base, environmentally.

There is no issue with the content of the Guardian. Just suggestions; especially the opportunity to keep the public informed and solicit requests for public comment. This notice would help the public to be prepared to provide comments. (Mr. Cooper referenced an EPA document regarding "early and meaningful" community involvement).

What is it about the newsletter that would provide meaningful public information? Provide a short article to prepare the public for upcoming plans and be able to provide comments, with a schedule and information on the process. Include information on all technologies and available remedies, including no further action. The intent is not to sway the public but to encourage interest and engagement. Also include a list of documents and a brief description of those documents.

Another suggestion is to give an overview of the progress and describe the work done. Include a review of what has been done and what is still left to be done. Encourage the public to care.

Mr. Smith commented that the focus has been on accomplishments, not usually what is coming up. The desire is to still keep that focus, but include Mr. Cooper's suggestions such as document schedule and public review comment periods. As for the upcoming pilot studies and test cases, Travis doesn't want to speculate in the Guardian, but can include information on what documents will require public review. Mr. Smith stated that he'd like to keep the focus on what has been accomplished.

Mr. Anderson mentioned that the current issue of the Guardian has a viewpoint written by someone in the Air Force. Mr. Smith usually writes the viewpoint; Mr. Anderson would like to include various authors for this article. He extended an invitation to Mr. Cooper, to provide a viewpoint, possibly for the April edition. Mr. Cooper said yes; Mr. Cooper also needs to provide a photo. Mr. Chang added that a point of view from the state would be important also. Mr. Anderson said he has not heard from the state community representative, Mr. Simpson.

It was mentioned that Mr. Cooper and Mr. Chang will not be able to attend the RAB but Mr. Freitas will be there to represent EPA.

B. Treatment Plant Operation and Maintenance Update

Mr. Duke reported on the water treatment plant status. The transition to CH2M Hill is now complete. Focus is now more on preventative measures and routine maintenance. Also, sustainable remediation is being pursued by the Air Force and other agencies. It is becoming the way to do business.

South Base Boundary Groundwater Treatment Plant

The South Base Boundary Groundwater Treatment Plant (SBBGWTP) performed at 97.6% uptime, and 3.5 million gallons of groundwater were extracted and treated during the month of September 2008. All of the treated water was discharged to Union Creek. The average flow rate for the SBBGWTP was 82.3 gallons per minute (gpm) and electrical power usage was 15,216 kWh; 20,846 pounds of CO2 was created (based on DOE calculation). Approximately 2.8 pounds of volatile organic compounds (VOCs) was removed during September. The total mass of VOCs removed since the startup of the system is 346.5 pounds (see Attachment 3).

One shutdown occurred on 22 September for a clogged discharge pipe to Union Creek which caused a backup at the final holding tank. Calcium and other minerals settled out and built up in the pipe. The line was cleaned and the system was back online 23 September. There is also build up in the final tank; though it has not affected the treatment of the water. In addition, the Supervisory Control and Data Acquisition (SCADA) system was having computer communication problems; a specialist was brought in and the system is working well now.

No optimization activities were planned or performed during September.

Central Groundwater Treatment Plant

The Central Groundwater Treatment Plant (CGWTP) performed at 91.7% uptime with approximately 2.8 million gallons of groundwater extracted and treated during the month of September 2008. All treated water was diverted to the storm drain. The average flow rate for the CGWTP was 70.4 gpm and electrical power usage was 36,041 kWh for all plants; 49,376 pounds of CO2 was created. Natural gas usage for the ThOx was 2,420 therms. Approximately 7.6 pounds of VOCs were removed from groundwater, and 15 pounds from vapor, during September. The total mass of VOCs removed since the startup of the system is 10,938 pounds. (see Attachment 4).

There were two shutdowns connected with the CGWTP in September, one due to a power surge/voltage spike and one due to a tank level sensor fault at the WTTP.

No optimization activities were conducted in September 2008. The remedial optimization team made suggestions to optimize operations. A technical memo will be out shortly recommending taking the UVOx off-line and using carbon only. The concentrations are much lower now, energy use is high, and the bulbs cost about $2,000 each and need replacement every 10 months. Carbon is a more economic option. The UVOx system would still be available if needed. Also in the memo will

be the suggestion to use vapor Granular Activated Carbon (GAC) instead of the ThOx for the same reason: burning too much natural gas for low levels of VOCs.

North Groundwater Treatment Plant

The North Groundwater Treatment Plant (NGWTP) performed at 100% uptime with approximately 540,000 gallons of groundwater extracted and treated during the month of September 2008. All treated water was discharged to the duck pond. The average flow for the NGWTP was 12.4 gpm and electrical power usage was 9,016 kWh; 12,352 pounds of CO2 was created. Approximately 1.6 ounces of VOCs were removed during September. The total mass of VOCs removed since the startup of the system is 5,413.9 pounds (see Attachment 5).

No shutdowns occurred in the month of September 2008.

No optimization activities were planned or performed during September. Mr. Duke noted that this plant is approaching the end of the rebound study. Samples will be taken at the end of the year to see what rebound is occurring.

C. Grubbing Pile Transport and Disposal

Mr. Duke gave an update on the grubbing pile at the CAMU. The grubbing pile has been removed and disposed. It was transported to the Hay Road facility; the report is written on the work that was accomplished. ITSI will be doing the soil and sediment work and will include the report as an appendix.

D. Second Five Year Review EPA Concurrence Letter

The concurrence letter from the EPA is now final. It will be kept in the administrative record for land use controls (LUC). Some additional text has been added by the EPA attorney.

Mr. Anderson handed out packets to the agencies that included: Revised letter for LUC for groundwater sites; and, Change out pages for the draft Remedial Action Report (RAR) to make it final, including binder covers and spines. Electronic version is forthcoming.

Mr. Chang also asked for an electronic copy of the concurrence letter.

E. Vapor Intrusion Assessment Status

Mr. Anderson gave an update on the VI Assessment status. Work is currently in between construction seasons. First part of work is completed. A tech memo will be submitted and will include information on sampling results, what has been learned, and also what the next steps will be. The priority for this memo is not as high as other documents, so there is more time to get it written. It is on the agenda to let everyone know it is not forgotten. Results from EPA's sampling will also be included.

F. Phyto Area Study Schedule

Mr. Anderson gave an update on the phyto area study schedule. This study is on the agenda but a detailed schedule is not yet available. The work should start in late February or early March. Field work will commence next construction season, with Parsons doing the work. A tech memo will come out with results and assessment. This is a follow up, funded by AFCEE, to determine efficiency of the phyto area. It will include core sampling and transpiration testing to determine how much of the contaminant mass is being removed.

G. Triad Process

Mr. Wray pointed out that Mr. Elliott is the technology manager for CH2M Hill on this contract and has extensive experience at Travis AFB. He also introduced Mr. Heinrich, who was the project manager for the POCO work. He has identified two sites that need additional work: ST018 (MTBE) and ST027B (TCE).

Mr. Elliott gave a presentation of the triad process (see Attachment 6). Triad is not just for investigations, but for all work being done at Travis. It is a way of proceeding in 'real time'. Mr. Elliott referred to slides defining triad and each of its components: Systematic planning, Dynamic work plans and Real-time analysis. It is a consensus driven, team work process with shorter discreet steps. Direct contrast to what used to be done; three volume work plans that took months to write and did not necessarily address what was actually found when work finally started. Triad encourages real-time data collection, analysis and different levels of review, bringing the whole team onboard. DP039 bioreactor work is a good example of upfront planning and team work to make quick decisions. The premise is to present plans for upcoming work before the work plan is drafted, to give everyone a chance to see what is planned and allow them to provide feedback. The two plans discussed this morning are for ST027B and LF008.

1. Document Introduction

ST027B Draft Work Plan (see Attachment 7)

Mr. Heinrich presented slides showing a preview of the draft work plan for the investigation at ST027B. This site is located in the WIOU near the flight line. The area is covered by pavement and low quality grassland. Its lithology includes a bedrock ridge which strongly influences the groundwater flow and formation of GW mound in western part of the site with radial flow away from the mound. There is a TCE plume that needs to be characterized. Mr. Freitas asked if there was surface water or water utilities present. There are no buried utilities in the vicinity; there is a drainage swale that runs along the south side of the road. There is no evidence of groundwater recharge or infiltration.

Only fuels were found in the NE portion of the site and continue to be managed under the POCO program; TCE was found in the SW portion of the site. The

TCE plume is partially defined and doesn't appear to be connected to the ST016 (fuel) plume.

Mr. Heinrich presented slides describing a tentative schedule for actions and meetings, and also passed out a map with Proposed Gore-Sorber Survey locations. The passive soil gas survey takes 6-8 weeks to implement, including permitting, the actual time they are in the soil, and analysis time. Installed by direct push, the Gore-Sorbers are set in 3-5 feet below ground surface and then capped. They are left in place for 2-3 weeks, collected, and then sent in for analysis. Mr. Elliott added that results are sent back as a 'picture' of levels of TCE; these are qualitative field screening results, not quantitative. This picture will be used to determine locations for drilling wells and collecting samples for quantitative analysis. The Gore-Sorber SOP will be followed for installation, collection and analysis. The screening tool is ideal for a large area to aid in zeroing in on the source area.

The number of steps and stages in the slides are tentative; depending on what is found there may be more or less. Eventually results from entire investigation will be reported in a Site Characterization/Investigation report; ultimately it will be used to support remedy selection in a focused feasibility study.

CH2M Hill would like agreement on the use of the Gore-Sorber field screening before the draft work plan is submitted, to get them in place before the rainy season starts. Mr. Salcedo and Mr. Friedman concur; Mr. Chang will call the EPA chemist Mr. Eidelberg for his input. Ms. Snow requested additional survey sites across the taxiway (to the south).

LF008 Draft Rebound Study Tech Memo (see Attachment 8)

Mr. Elliott presented slides previewing the draft tech memo for LF008. Late November, probably around the third week, a tech memo will be out for a proposed rebound study. A brief history of the site was presented. No source of contamination remains any longer; residential cleanup levels were achieved in the soil. Due to lithology of the site, flowrates from the extraction wells is very low. Although three extraction wells have been pumping for seven years, no real change has been seen in the concentration levels of the chemicals of concern over time. Mr. Anderson pointed out the location of the three wells on the map in relation to the source area. A spike occurred in the alpha-Chlordane levels, when there was excavation, in two of the wells: EW720 and EW721. EW719, which is outside of the source area, did not have this spike. Mr. Elliott passed out a figure from the Five Year Review which shows the plume in 2003 and again in 2008 (also on slides). No change in the size of the plume was observed; however, based on a model, the capture line has been extended.

Mr. Elliott said a one year, or possibly six month, rebound study needs to be performed. If concentrations increase, this provides information to aid in selecting a remedy. The pesticides are large molecules that readily adsorb onto

the clay soil. Mr. Freitas asked what if no rebound occurs. Mr. Anderson answered that the conclusion would be that pump and treat isn't working. One solution may be for permanent LUC area with an annual sampling event for monitoring.

There is not a schedule for a feasibility study (FS) yet. An appropriate remedy for this site has yet to be selected. The Action Plan will present an overall approach for all the groundwater sites; answers (from the rebound study) are needed before presenting a Focused FS.

Mr. Anderson stated that the team can expect to see more rebound evaluations forthcoming.

2. Document Review

Bio-Reactor Draft Work Plan

The plan was emailed the morning of the meeting. The dual phase extraction wells have been shut off. The agencies were asked to provide comments during the week following the meeting.

3. NEW ACTION ITEM REVIEW

None.

4. PROGRAM/ISSUES/UPDATE

A. Five Year Review Planning Schedule

A suggested schedule was handed out. Mr. Smith pointed out that the base would like to have all RODs on the same Five Year Schedule, thus, some will actually occur one year early, at four years. The benefit is that Travis will produce one report instead of individual reports.

B. Potrero Hills Discussion

Mr. Anderson discussed Potrero Hills status. TAFB is not a key player at this site, but is one of the responsible parties. The prime is a private firm, and that firm is running the environmental field work. The work is under an order from the Water Board, and not ERP. Once the WB rescinds the order, after the cleanup is complete by the prime responsible party, then the site will come back to TAFB to finish. Perchlorate contamination exists at the site, as a result of the past actions of a private firm leasing the property. The concentration of perchlorate ranges from 160 to 350 ppb; the last round had the lowest numbers at 120 ppb. Three monitoring wells have been established. More wells are needed and the plumes need to further

characterization. The contact person at the WB is not Mr. Friedman. A separate case handler from the WB has been assigned.

Mr. Freitas asked if there were private wells on the land. Mr. Anderson answered there is one, upgradient from the plume. At this time there is nothing TAFB can do to speed up the process, but they are assuming there will be ICs since Suisun Marsh is so close. Mr. Parrot added that ICs are already in place on the private property; they were agreed upon with the Air Force.

Mr. Salcedo mentioned that this land is part of the Base Master Plan, thus in the event of land transfer all controls go with it. Mr. Anderson verified this is true, and all ICs will be in the ROD. The restrictions go with the deed and are already recorded for the private properties.

This site is 25 acres and about 2 ½ miles south of the base, just north of the marsh. It is a former NIKE missile battery.

In closing the meeting, Mr. Duke verified that Mr. Freitas will talk to the EPA chemist and get back to CH2M Hill about proceeding with the Gore-Sorber survey. Meanwhile, they will push ahead with obtaining the base permits.

TRAVIS AIR FORCE BASE
ENVIRONMENTAL RESTORATION PROGRAM
REMEDIAL PROGRAM MANAGER'S MEETING
22 Oct 2008, 9:30 A.M.
AGENDA

1. ADMINISTRATIVE

   A. Previous Meeting Minutes
   B. Action Item Review
   C. Meeting Dates and Master Document Schedule and Format Review

2. CURRENT PROJECTS

   A. Public Affairs (David Cooper)
   B. Treatment Plant operation and maintenance update (Lonnie)
   C. Grubbing Pile Transport and Disposal (Lonnie)
   D. Second 5 Year Review EPA Concurrence Letter (Glenn)
      (1). Status of requested Action items
   E. Vapor Intrusion Assessment Status (Glenn)
   F. Phyto Area Study Schedule (Glenn)
   G. TRIAD Process (CH2M Hill)
      (1). Document Introduction
         (a) ST027 Draft Work Plan
         (b) LF008 Draft Rebound Study Tech Memo
      (2). Document review
         (a) Bio-Reactor Draft Work Plan

3. New Action Item Review

4. PROGRAM/ISSUES/UPDATE
   A. 5-Year Review Planning Schedule


5 Year Review
Schedule Planned - Ti

   B. Potrero Hills Discussion

Travis AFB Master Meeting and Document Schedule

Annual Meeting and Teleconference Schedule

Suppliers Teleconference (8:30 a.m. - 10:00 a.m.)	Monthly RPM Meeting (Begins at 9:30 a.m.)	RPM Teleconference (Begins at 9:30 a.m.)	Restoration Advisory Board Meeting (Begins at 7:00 p.m.) (Poster Session at 6:30 p.m.)
1-22-08	1-23-08	1-7-08*	—
2-26-08	2-27-08	2-4-08	—
3-18-08	3-19-08 #	—	—
4-22-08	4-23-08	4-7-08	4-24-08
5-20-08	~~5-21-08 ##~~	5-5-08	—
6-17-08	6-18-08	—	—
~~7-29-08~~	~~7-30-08 ##~~	—	—
~~8-26-08~~	~~8-27-08 ##~~	8-13-08	—
9-23-08	9-24-08	—	—
10-21-08	10-22-08	10-6-08	10-23-08
—	—	11-10-08	—
12-09-08	12-10-08	—	—

*During the 7 Jan teleconference an additional meeting with EPA was scheduled for 9-10 Jan to discuss past GSAP issues in preparation for moving ahead with the current GSAP and the upcoming Groundwater Performance Based Contract (PBC).

**Holiday Weekend

Teleconference for the 3/19/08 meeting at **0800**

The 21 May, 30 July and 27 August Remedial Program Manager's Meeting were cancelled.

Travis AFB Master Document Schedule
(continued)

	PRIMARY DOCUMENTS				
	Basewide Groundwater **Travis, Glenn Anderson**	**Potrero Hills Annex** **Travis, Glenn Anderson**	**HSP Update** **Travis, Lonnie Duke**	**LF007C Groundwater** **Travis, Glenn Anderson**	**QAPP Update** **Travis, Glenn Anderson**
Life Cycle	**ROD**	**ROD**		**Work Plan**	
Scoping Meeting	**1-24-07**	**180 days after Water Board Order Rescinded**	**NA**	**NA**	**NA**
Predraft to AF/Service Center	2-01-09	+ 360 days	11-12-08	11-28-08	12-18-08
AF/Service Center Comments Due	4-01-09	+ 420 days	11-26-08	12-05-08	1-09-09
Draft to Agencies	6-15-09	+ 480 days	12-10-08	12-10-08	1-16-09
Draft to RAB	6-15-09	+ 480 days	12-10-08	12-10-08	1-16-09
Agency Comments Due	8-15-09	+ 540 days	2-10-09	2-10-09	3-24-09
Response to Comments Meeting	**9-01-09**	**+ 555 days**	**2-24-09**	**2-24-09**	**4-07-09**
Agency Concurrence with Remedy	9-15-09	+ 570 days	NA	NA	NA
Draft Proposed Plan to Agencies	12-01-09	+ 600 days	NA	NA	NA
Issue Proposed Plan	1-15-10	+ 615 days	NA	NA	NA
Public Comment Period	1-15-10 to 2-15-10	+ 615 to 645 days	NA	NA	NA
Public Meeting	**1-28-10**	**+ 625 days**	NA	NA	NA
Response to Comments Due	3-01-10	+ 640 days	3-10-09	3-10-09	4-21-09
Draft Final Due	3-01-10	+ 640 days	NA	NA	NA
Final Due	5-01-10	+ 700 days	3-10-09	3-10-09	4-21-09

Travis AFB Master Document Schedule
(Continued)

SECONDARY DOCUMENTS			
Life Cycle	**LF008 Rebound Study Work Plan Travis, Lonnie Duke; CH2M Hill, Mike Wray**	**Action Plan Travis, Glenn Anderson CH2M HILL, Chuck Elliott**	**Site ST027 Plume Delineation Work Plan Travis, Lonnie Duke CH2M HILL, Gavin Heinrich**
Scoping Meeting	**NA**	**NA**	**NA**
Predraft to AF/Service Center	10-24-08	11-14-08	11-21-08
AF/Service Center Comments Due	10-31-08	12-05-08	11-28-08
Draft to Agencies	11-17-08	12-10-08	12-10-08
Draft to RAB	11-17-08	12-10-08	12-10-08
Agency Comments Due	12-17-08	1-16-09	1-16-09
Response to Comments Meeting	**1-06-09**	**1-22-09**	**1-22-09**
Response to Comments Due	1-20-09	2-05-09	2-05-09
Draft Final Due	NA	NA	NA
Final Due	1-20-09	2-05-09	2-05-09
Public Comment Period	NA	NA	NA
Public Meeting	**NA**	**NA**	**NA**

Travis AFB Master Document Schedule
(Continued)

INFORMATIONAL DOCUMENTS		
Life Cycle	**Quarterly Newsletters (Jan 2009) Travis, Glenn Anderson**	**2007/2008 GSAP Annual Report Travis, Lonnie Duke CH2M HILL, Leslie Royer**
Scoping Meeting	**NA**	**NA**
Predraft to AF/Service Center	NA	10-22-08
AF/Service Center Comments Due	NA	11-05-08
Draft to Agencies	12-15-2008	11-19-08
Draft to RAB	NA	11-19-08
Agency Comments Due	01-06-2008	1-16-09
Response to Comments Meeting	**TBD**	**2-16-09**
Response to Comments Due	01-08-2008	3-16-09
Draft Final Due	NA	NA
Final Due	01-14-2008	3-16-09
Public Comment Period	NA	NA
Public Meeting	**NA**	**NA**

Travis AFB Master Document Schedule
(Continued)

HISTORICAL DOCUMENTS			
Life Cycle	**POCO Evaluation of Monitored Natural Attenuation Travis, Lonnie Duke; CH2M HILL, Mike Wray**	**Five Year Review Travis, Glenn Anderson CH2M HILL, Loren Krook**	**Soil Remedial Action Report Travis, Glenn Anderson FT003, FT004, LF007E, SD045**
Scoping Meeting	**NA**	**01-23-08**	**NA**
Predraft to AF/Service Center	05-23-08	03-11-08	01-29-08
AF/Service Center Comments Due	06-06-08	03-26-08	02-13-08
Draft to Agencies	06-20-08	04-10-08	05-09-08
Draft to RAB	06-20-08	04-10-08	05-09-08
Agency Comments Due	07-18-08	06-11-08	07-11-08
Response to Comments Meeting	**NA**	**08-04-08**	**09-17-08**
Response to Comments Due	NA	NA	NA
Draft Final Due	NA	09-16-08	09-17-08
Final Due	08-22-08 (8-14-08 Actual)	09-24-08	09-30-08
Public Comment Period	NA	NA	NA
Public Meeting	**NA**	NA	**NA**

South Base Boundary Groundwater Treatment Plant
Monthly Data Sheet

Report Number: 98 **Reporting Period: 1 – 30 September 2008** **Date Submitted: 10 October 2008**

This data sheet includes the following: results for the operation of the South Base Boundary Groundwater Treatment Plant (SBBGWTP); a summary of flow rates for the individual extraction wells; a brief description of any shutdowns or significant events related to the system: and a summary of analytical results for selected samples collected.

Operations Summary – September 2008

Operating Time: **703 hours** Percent Uptime: 97.6**%**

Electrical Power Usage: 15,216 kWh

Gallons Treated: **3.5 million gallons** Gallons Treated Since July 1998: **623 million gallons**

Volume Discharged to Union Creek: **3.5 million gallons**

Volume Used for Dust Suppression: **0 gallons**

VOC Mass Removed: **2.8 pounds**[a] VOC Mass Removed Since July 1998: **346.5 pounds**

Rolling 12-Month Cost per Pound of Mass Removed: $3,519[b]

Monthly Cost per Pound of Mass Removed: $3,174[b]

[a] Calculated using September 2008 EPA Method SW8260B analytical results.
[b] Costs include operations and maintenance, reporting, analytical laboratory, project management, and utility costs related to operation of the system. High costs are due to low influent concentrations.

Flow Rates

Average Groundwater Total Flow Rate: 82.3[a]

Average Flow Rate (gpm)[b]							
FT005				**SS029**		**SS030**	
EW01x05	1.6	EW736x05	4.3[g]	EW01x29	6.1	EW01x30	4.5
EW02x05	2.8	EW737x05	Off line[c]	EW02x29	10.1	EW02x30	4.6
EW03x05	4.2	EW742x05	Off line[c]	EW03x29	Off line[d]	EW03x30	Off line[d]
EW731x05	Off line[c]	EW743x05	Off line[c]	EW04x29	11.3	EW04x30	20.0
EW732x05	Off line[c]	EW744x05	Off line[c]	EW05x29	5.0	EW05x30	11.9
EW733x05	Off line[c]	EW745x05	Off line[c]	EW06x29	15.9	EW06x30	0.0[f]
EW734x05	13.3[eg]	EW746x05	Off line[c]	EW07x29	6.5	EW711x30	3.6
EW735x05	3.9[g]						
FT005 Total:	**30.1**			**SS029 Total:**	**54.9**	**SS030 Total:**	**44.6**

[a] The average groundwater flow rate was calculated using the Union Creek Discharge Totalizer and dividing it by the operating time of the plant.
[b] Average extraction well flow rates measured by each extraction well totalizer divided by the well's operating time.
[c] Extraction well was shutdown for a one-year rebound study in December 2007 based on the *Work Plan for RPO Actions at Sites SD031, FT004, and FT005* (CH2M HILL, 2007).
[d] Extraction well was off line due to low VOC concentrations.
[e] Extraction well was operational for less than 10% of total uptime.
[f] Extraction well was not operational during September 2008 due to low flow and recharge.
[g] Extraction well was off line since 12 September 2008 when the plant SCADA was not operating.

gpm—gallons per minute

Shutdown/Restart Summary

Location	Shutdown		Restart		Cause
	Date	Time	Date	Time	
SBBGWTP (water)	22 September 2008	17:00	23 September 2008	10:00	Clogged discharge pipe from SBBGWTP to Union Creek
SBBGWTP = South Base Boundary Groundwater Treatment Plant					

Summary of O&M Activities

Monthly groundwater sampling at the SBBGWTP was performed on 2 September 2008. Sample results are presented in Table 1. The total VOC concentration (95.1 µg/L) in the influent sample has increased since the July 2008 sample (69.8 µg/L). 1,2-Dichloroethane, the indicator chemical for Site FT005, was not detected in the influent sample. Methylene chloride, a common laboratory contaminant, was detected at a trace concentration in the effluent sample. In addition, TPH-G was detected in the effluent sample at a concentration of 5.7 J µg/L.

On 12 September 2008, the SCADA system was malfunctioning because the PLC was not properly communicating with the SCADA system. The SCADA system worked intermittently throughout the month of September. In addition, three off-base wells (EW734x05, EW735x05, and EW736x05) were off-line due to the SCADA system being down. The groundwater treatment plant and remaining extraction wells continued operating. The SCADA system will require a specialist to trouble-shoot the communications issue. This will be done within about the first week in October.

On 22 September 2008, the treatment plant was shut down due to a clogged discharge pipe from the plant to Union Creek. The final holding tank for the SBBGWTP was backing up due to calcium buildup in the discharge pipe, and the sequestrant feed pump was noted as having broken tubing. After the calcium buildup was removed and the feed pump repaired, the system was restarted and is now operating properly.

Optimization Activities

On 4 December 2007, nine extraction wells (EW731x05, EW732x05, EW733x05, EW737x05, and EW742x05 through EW746x05) were shut down for rebound testing in accordance with the *Work Plan for Remedial Process Optimization (RPO) Actions at Sites SD031, FT004, and FT005* (CH2M HILL, 2007). These extraction wells will remain off-line for one year. These extraction wells will remain off-line for one year. These wells were sampled in May 2008 as part of the annual GSAP event. At the end of the rebound period (Fourth Quarter 2008), the groundwater extraction wells will be sampled to assess rebound and plume stability. No other optimization activities were conducted in September 2008.

Table 1
Summary of Groundwater Analytical Data for September 2008 – South Base Boundary Groundwater Treatment Plant

Constituent	Instantaneous Maximum[a] (µg/L)	Detection Limit (µg/L)	N/C	2 September 2008 (µg/L)	
				Influent	Effluent
Halogenated Volatile Organics					
Bromodichloromethane	5.0	0.17	0	ND	ND
Carbon Tetrachloride	0.5	0.19	0	ND	ND
Chloroform	5.0	0.16	0	ND	ND
Dibromochloromethane	5.0	0.17	0	ND	ND
1,1-Dichloroethane	5.0	0.16	0	ND	ND
1,2-Dichloroethane	0.5	0.13	0	ND	ND
1,1-Dichloroethene	5.0	0.14	0	ND	ND
cis-1,2-Dichloroethene	5.0	0.15	0	5.7	ND
trans-1,2-Dichloroethene	5.0	0.15	0	0.16 J	ND
Methylene Chloride	5.0	0.32	0	0.39 J	0.33 J
Tetrachloroethene	5.0	0.20	0	ND	ND
1,1,1-Trichloroethane	5.0	0.16	0	ND	ND
1,1,2-Trichloroethane	5.0	0.32	0	ND	ND
Trichloroethene	5.0	0.16 – 0.64	0	84	ND
Vinyl Chloride	0.5	0.40	0	ND	ND
Non-Halogenated Volatile Organics					
Benzene	1.0	0.16	0	ND	ND
Ethylbenzene	5.0	0.16	0	ND	ND
Toluene	5.0	0.17	0	ND	ND
Xylenes	5.0	0.19 – 0.34	0	ND	ND
Other					
Total Petroleum Hydrocarbons – Gasoline	50	4.9	0	NM	5.7 J
Total Petroleum Hydrocarbons – Diesel	50	33	0	NM	ND
Total Suspended Solids (mg/L)	NE	1.1	0	1.2 J	NM

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

J = analyte concentration is considered an estimated value
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

Central Groundwater Treatment Plant Monthly Data Sheet

Report Number: 110 **Reporting Period: 1 – 30 September 2008** **Date Submitted: 10 October 2008**

This data sheet includes the following: results for the operation of the Central Groundwater Treatment Plant (CGWTP), West Treatment and Transfer Plant (WTTP), and thermal oxidation (ThOx) system (previously referred to as the two-phase extraction [TPE] system); a summary of flow rates for the CGWTP, WTTP, ThOx, and extraction wells EW01x16, EW02x16, EW03x16, EW605x16, and EW610x16; a brief description of any shutdowns or significant events related to the systems: and a summary of analytical results for selected samples collected.

Operations Summary – September 2008

Operating Time:		Percent Uptime:		Electrical Power Usage:	
CGWTP:	660 hours	**CGWTP:**	91.7%	**CGWTP:**	7,760 kWh
WTTP:	Water: 627 hours	**WTTP:**	Water: 87.1%	**WTTP:**	20,450 kWh
	Vapor: 627 hours		Vapor: 87.1%		
ThOx:	660 hours	**ThOx:**	91.7%	**ThOx:**	7,831 kWh

ThOx: Natural Gas Usage: 2,420 therms

Gallons Treated: **2.8 million gallons**

Gallons Treated Since January 1996: **392 million gallons**

VOC Mass Removed:

7.6 lbs (groundwater only)[a]

15.0 lbs (vapor only)[b]

VOC Mass Removed Since January 1996:

2,374 lbs from groundwater

8,564 lbs from vapor

UV/Ox DRE: 99.8 %

ThOx DRE: 99.8 %

Rolling 12-Month Cost per Pound of Mass Removed: $602[c]

Monthly Cost per Pound of Mass Removed: $938[c]

[a] Calculated using September 2008 EPA Method SW8260B analytical results.
[b] Total VOC vapor mass removed was calculated using September 2008 EPA Method TO-14 analytical results for the WTTP system, WTTP extraction wells, and the ThOx system.
[c] Costs include operations and maintenance, reporting, analytical laboratory, project management, and electric and natural gas costs related to operation of the system.

DRE = destruction removal efficiency UV/Ox = ultraviolet oxidation

Flow Rates

Average Groundwater Flow Rate: **70.4 gpm**[a]

Location	Average Flow Rate	
	Groundwater (gpm)[b]	Soil Vapor (scfm)
EW01x16	24.6	NA
EW02x16	6.2	NA
EW03x16	0.38	NA[c]
EW605x16	13.4	NA[c]
EW610x16	NA[d]	NA[c]
WTTP	25.1[e]	187
ThOx	< 0.1[e]	54.0

[a] as measured by the effluent discharge to the storm drain divided by the operating time.
[b] as measured by extraction well totalizer divided by the operating time.
[c] soil vapor was extracted from the well; however, the flow rates are not measured.
[d] the exctraction well pump was malfunction in September 2008.
[e] as measured by the effluent groundwater pumped to the CGWTP divided by the operating time.

gpm = gallons per minute
NA = not applicable/not available
scfm = standard cubic feet per minute

Flow Rates

Flow Rate from the WIOU, DP039, and LF008 Extraction Wells on September 26, 2008 (gpm)							
SD037/ SD043				**SD033/SD034/ DP039**		**LF008/SD036**	
EW599x37	0.6	EW705x37	0.4	EW501x33	1.2	EW719x08	1.0
EW700x37	2.2	EW706x37	0.1	EW503x33	0.1	EW720x08	2.3
EW701x37	3.2	EW707x37	0.5	EW01x34	0.2	EW721x08	1.1
EW702x37	0.0[a]	EW510x37	2.2	EW02x34	0.0[a]	EW593x36	1.3
EW703x37	0.0[a]	EW511x37	2.2	EW563x39	1.0	EW594x36	0.0[a]
EW704x37	1.2	EW555x43	0.8	EW782x39	1.5	EW595x36	1.9

gpm—gallons per minute

[a] Flow meter malfunctions and may need to be repaired/replaced.

Shutdown/Restart Summary

Location	Shutdown		Restart		Cause
	Date	Time	Date	Time	
CGWTP (Groundwater):					
CGWTP	20 September 2008	04:00	22 September 2008	16:00	Electrical power surge/voltage spike
WTTP (Groundwater and Vapor):					
WTTP	19 September 2008	14:00	23 September 2008	11:00	Tank level sensor fault
ThOx (vapor):					
ThOx	20 September 2008	04:00	22 September 2008	16:00	CGWTP was off line

CGWTP = Central Groundwater Treatment Plant
ThOx = Thermal Oxidation System
WTTP = West Treatment and Transfer Plant

Summary of O&M Activities

Monthly groundwater sampling at the CGWTP and quarterly groundwater sampling at the ThOx and WTTP were performed on 2 September 2008. Groundwater sample results are summarized in Table 1. Rebound vapor samples were collected from EW03x16, EW605x16, and EW610x16 on 3 September 2008. In addition, quarterly vapor samples were collected at the ThOx unit, the WTTP SVE system, and the manifold at the WTTP SVE system on 3 September 2008. Vapor results are presented in Tables 2 through 5, respectively.

The total VOC concentration (326.0 µg/L) in the September 2008 CGWTP influent groundwater sample has decreased since the August 2008 sampling (533.4 µg/L). Chloroform, cis-1,2-dichloroethene, methylene chloride, and trichloroethene (TCE) were present in the treated water samples from the granular activated carbon (GAC) sample points. These VOCs were also detected in the system effluent at concentrations less than their respective effluent limits. The detections in these samples may be attributed to desorption from the GAC.

In September 2008, the extraction well pump for EW610x16 was malfunctioning and not pumping water. The splines in the pump are suspected to be stripped, and the pump may need to be replaced. Due to construction near the area of the well (on the flight line), the pump could not be pulled and inspected. The pump will be inspected once the construction near the well is completed.

On 4 August 2008, vapor extraction from EW03x16, EW605x16, and EW610x16 was turned off for one month as part of an annual rebound test. Vapor samples were collected at each extraction well on 3 September 2008, and vapor extraction was restarted at the three extraction wells following the sampling. The ThOx system treats soil vapor from the three extraction wells and the 2-Phase® well (TPE-W). Cis-1,2-DCE and TCE were detected in the vapor samples at EW03x16 and TPE-W at concentrations greater than 1,000 ppbv. Currently, the ThOx vapor influent sample consists only of vapor extracted from TPE-W. A sample port will be installed to measure the vapor concentrations from a combination of vapor from TPE-W, EW03x16, EW605x16, and EW610x16.

The WTTP SVE system continued to treat soil vapor from Site DP039 and the WIOU. The September 2008 influent VOC vapor concentration was approximately 309 ppbv, and the concentrations have been steadily decreasing since 2007. From the manifolds at the WTTP SVE system, the highest VOC concentrations were reported in V-202 (Site DP039). TCE was detected at a concentration of 1,800 ppbv in V-202. The WTTP system also continues to extract groundwater and transfers it to the CGWTP for treatment.

Optimization Activities

No optimization activities were conducted for September 2008.

Table 1
Summary of Groundwater Analytical Data for September 2008 – Central Groundwater Treatment Plant

Constituent	Instantaneous Maximum[a] (µg/L)	Detection Limit (µg/L)	N/C	2 September 2008 (µg/L) WTTP Effluent	TPE Effluent	Influent	After UV/OX	After Carbon 1 Effluent	After Carbon 2 Effluent	After Carbon 3 Effluent	System Effluent
Halogenated Volatile Organics											
Bromodichloromethane	5.0	0.17	0	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Disulfide	5.0	0.45	0	ND	1.9	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	0.5	0.19	0	ND	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	5.0	0.17	0	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	5.0	0.16	0	0.35 J	ND	0.18 J	0.16 J	0.22 J	0.25 J	0.27 J	0.20 J
1,2-Dichlorobenzene	5.0	0.13	0	ND	0.73	0.22 J	ND	ND	ND	ND	ND
1.3-Dichlorobenzene	5.0	0.16	0	ND	0.98	0.24 J	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	5.0	0.16	0	ND	0.33 J	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	5.0	0.16	0	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	0.5	0.13	0	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	5.0	0.14	0	1.4	ND	1.2	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	5.0	0.15	0	10	40	41	0.41 J	0.43 J	0.64	0.73	0.54
trans-1,2-Dichloroethene	5.0	0.15	0	1.7	0.43 J	2.2	ND	ND	ND	ND	ND
Methylene Chloride	5.0	0.32	0	0.38 J	0.35 J	0.37 J	ND	0.40 J	0.34 J	0.39 J	0.38 J
Tetrachloroethene	5.0	0.20	0	0.69	0.43 J	0.61	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	5.0	0.16	0	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	5.0	0.32	0	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	5.0	0.16 – 1.6	0	200	270	280	ND	2.9	2.1	1.2	0.80
Vinyl Chloride	0.5	0.17	0	ND	ND	ND	ND	ND	ND	ND	ND
Non-Halogenated Volatile Organics											
Benzene	1.0	0.16	0	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	5.0	0.16	0	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	5.0	0.17	0	ND	ND	ND	ND	ND	ND	ND	ND
Total Xylenes	5.0	0.19 – 0.34	0	ND	ND	ND	ND	ND	ND	ND	ND
Other											
Total Dissolved Solids (mg/L)	NE	4.7	0	NM	NM	NM	NM	NM	NM	800	NM

[a] 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
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
NS = not sampled
µg/l = micrograms per liter

Table 2
Soil Vapor Analytical Data for September 2008 – Site SS016

Constituent	3 September 2008 (ppbv)		
	EW03x16	EW605x16	EW610x16
Volatile Organics			
Benzene	ND (48)	20.1	33.3
Carbon Tetrachloride	ND (28)	ND (0.65)	ND (0.65)
Chloroethane	ND (28)	ND (0.66)	ND (0.66)
Chloroform	ND (33)	ND (0.76)	1.12 J
Chloromethane	ND (24)	1.75 J	1.93 J
cis-1,2-Dichloroethene	5,560	15.4	34.1
trans-1,2-Dichloroethene	42.9 J	5.46	4.08 J
1,1-Dichloroethene	ND (25)	1.92 J	2.54 J
Ethylbenzene	ND (52)	8.49	10.2
Freon 11	ND (24)	ND (0.56)	ND (0.56)
Freon 12	ND (19)	0.50 J	0.69 J
Freon 113	ND (26)	ND (0.60)	ND (0.60)
Methylene Chloride	304	4.47	8.27
Methyl Ethyl Ketone (2-Butanone)	ND (49)	26.4	28.8
Tetrachloroethene	56 J	ND (0.78)	0.89 J
Toluene	ND (55)	66.8	85.1
1,1,1-Trichloroethane	ND (36)	ND (0.83)	ND (0.83)
1,1,2-Trichloroethane	ND (52)	ND (1.2)	ND (1.2)
Trichloroethene	16,400	302	44.5
Vinyl Chloride	110 J	3.85 J	ND (0.89)
Xylenes, m,p-	ND (102)	30.1	34.7
Xylene, o-	ND (56)	9.86	11

J = analyte concentration is considered an estimated value
ND = not detected
NM = not measured
ppbv = parts per billion by volume
SVE = soil vapor extraction
( ) = detection limit

TABLE 3
Soil Vapor Analytical Data for September 2008 – Central Groundwater Treatment Plant

Constituent	3 September 2008 (ppbv)	
	ThOx Influent[a]	ThOx Effluent
Volatile Organics		
Benzene	ND (36)	0.10 J
Bromomethane	ND (21)	0.039 J
Carbon Tetrachloride	ND (24)	ND (0.038)
Chloroethane	ND (22)	0.097 J
Chloroform	ND (24)	0.049 J
Chloromethane	ND (100)	0.60
cis-1,2-Dichloroethene	1,500	0.096 J
1,2-Dichlorobenzene	ND (45)	ND (0.070)
1,3-Dichlorobenzene	46 J	ND (0.065)
1,4-Dichlorobenzene	ND (41)	ND (0.064)
1,2-Dichloroethane	ND (30)	ND (0.047)
1,1-Dichloroethene	ND (21)	ND (0.032)
Ethylbenzene	ND (44)	0.080 J
Freon 11	ND (15)	0.059 J
Freon 12	ND (44)	0.15 J
Freon 113	ND (20)	ND (0.031)
Methylene Chloride	120 J	0.38 J
Methyl Ethyl Ketone (2-Butanone)	230 J	4.2
Tetrachloroethene	60 J	ND (0.040)
Toluene	35 J	0.19 J
trans-1,2-Dichloroethene	58 J	ND (0.050)
1,2,4-Trichlorobenzene	66 J	ND (0.098)
1,2,4-Trimethylbenzene	ND (40)	ND (0.063)
1,3,5-Trimethylbenzene	ND (42)	ND (0.065)
Trichloroethene	18,000	0.59
Vinyl Chloride	ND (46)	ND (0.071)
Xylenes, m,p-	ND (77)	0.19 J
Xylene, o-	ND (39)	0.088 J

[a] ThOx influent sample consists only of soil vapor from the TPE-well.

J = analyte concentration is considered an estimated value
ND = not detected
NM = not measured
ppbv = parts per billion by volume
ThOx = thermal oxidation system
( ) = detection limit

Table 4
Soil Vapor Analytical Data for September 2008 – West Transfer and Treatment Plant

Constituent	3 September 2008 (ppbv)		
	SVE Influent	SVE Mid-Treatment	SVE Effluent
Volatile Organics			
Benzene	ND (0.56)	0.14 J	0.073 J
Carbon Tetrachloride	0.38 J	0.046 J	0.065 J
Chloroethane	ND (0.35)	0.070 J	ND (0.035)
Chloroform	0.72 J	0.04 J	0.16 J
Chloromethane	ND (1.6)	0.81	0.88
cis-1,2-Dichloroethene	9.0	0.64	6.5
trans-1,2-Dichloroethene	0.95 J	0.067 J	0.17 J
1,3-Dichlorobenzene	ND (0.65)	ND (0.065)	0.095 J
1,1-Dichloroethane	0.39 J	ND (0.026)	0.09 J
1,2-Dichloroethane	ND (0.47)	ND (0.047)	0.088 J
1,1-Dichloroethene	24	0.31	3.7
Ethylbenzene	ND (0.68)	ND (0.068)	ND (0.068)
Freon 11	0.42 J	0.074 J	0.083 J
Freon 12	ND (0.68)	0.59	0.31
Freon 22	ND (0.37)	0.32	0.42
Freon 113	ND (0.31)	ND (0.031)	0.033 J
Methylene Chloride	1.3 J	0.39 J	0.42 J
Methyl Ethyl Ketone (2-Butanone)	ND (2.0)	0.43 J	2.1
Tetrachloroethene	0.71 J	0.047 J	0.041 J
Toluene	ND (0.54)	0.12 J	0.13 J
1,1,1-Trichloroethane	1.4 J	0.074 J	0.26
1,1,2-Trichloroethane	ND (0.54)	ND (0.054)	ND (0.054)
Trichloroethene	270	20	3.4
Vinyl Chloride	ND (0.71)	ND (0.071)	ND (0.071)
Xylenes, m,p-	ND (1.2)	ND (0.12)	0.13
Xylene, o-	ND (0.61)	ND (0.061)	ND (0.061)

J = analyte concentration is considered an estimated value
ND = not detected
NM = not measured
ppbv = parts per billion by volume
SVE = soil vapor extraction
( ) = detection limit

Table 5
Soil Vapor Analytical Data for September 2008 – West Transfer and Treatment Plant

Constituent	3 September 2008 (ppbv)		
	WTTPV-202	**WTTPV-203**	**WTTPV-204**
Volatile Organics			
Benzene	0.84 J	ND (0.56)	0.14 J
Bromodichloromethane	ND (0.44)	ND (0.44)	0.060 J
Bromomethane	ND (0.32)	ND (0.32)	0.043 J
Carbon Tetrachloride	0.44 J	ND (0.38)	0.55
Chloroform	3.2	0.46 J	0.95
Chloromethane	ND (1.6)	1.8 J	0.19 J
cis-1,2-Dichloroethene	52	6.2	4.8
trans-1,2-Dichloroethene	0.93 J	0.98 J	0.67
1,1-Dichloroethane	2.4	ND (0.26)	ND (0.026)
1,2-Dichloroethane	1.5 J	ND (0.47)	ND (0.047)
1,1-Dichloroethene	240	0.62 J	0.095 J
Ethylbenzene	ND (0.68)	ND (0.68)	ND (0.068)
Freon 11	0.51 J	0.42 J	0.30
Freon 12	ND (0.68)	ND (0.68)	0.48
Freon 22	0.92 J	0.73 J	0.36
Freon 113	0.32 J	ND (0.31)	0.099 J
Methylene Chloride	2.8 J	1.4 J	0.58 J
Methyl Ethyl Ketone (2-Butanone)	ND (2.0)	ND (2.0)	0.46 J
Tetrachloroethene	0.69 J	1.7 J	0.28
Toluene	0.88 J	0.54 J	0.18 J
1,1,1-Trichloroethane	13	ND (0.30)	0.033 J
1,1,2-Trichloroethane	1.3 J	ND (0.54)	ND (0.054)
Trichloroethene	1,800	350	52
Vinyl Chloride	ND (0.71)	ND (0.71)	ND (0.071)
Xylenes, m,p-	ND (1.2)	ND (1.2)	ND (0.12)
Xylene, o-	ND (0.61)	ND (0.61)	ND (0.061)

J = analyte concentration is considered an estimated value
ND = not detected
NM = not measured
ppbv = parts per billion by volume
( ) = detection limit

North Groundwater Treatment Plant Monthly Data Sheet

Report Number: 100 **Reporting Period: 1 – 30 September 2008** **Date Submitted: 10 October 2008**

This data sheet includes the following: results for the operation of the groundwater extraction systems; a summary of flow rates for the individual extraction wells; a brief description of any shutdowns or significant events related to the systems: and a summary of analytical results for selected samples collected.

Operations Summary – September 2008

Operating Time: **Water:** 744 hours

Percent Uptime: **Water:** 100%

Electrical Power Usage: **9,016kWh**

Gallons Treated: **0.54 million gallons**

Gallons Treated Since March 2000: **81.4 million gallons**

Volume Discharged to Duck Pond: **0.54 million gallons**

Volume Discharged to Storm Drain: **0 gallons**

Percentage of Treated Water to Beneficial Use: 100%

VOC Mass Removed:

0.1 lbs (groundwater only)[a]

0 lbs (vapor only)[b]

VOC Mass Removed Since March 2000:

173.9 lbs from groundwater

5,240 lbs from vapor[c]

Rolling 12-Month Cost per Pound of Mass Removed: $100,593[de]

Monthly Cost per Pound of Mass Removed: $24,221[d]

[a] Calculated using September 2008 EPA Method SW8260B analytical results.
[b] The SVE system was shut down in December 2007 in accordance with the *Work Plan for Remedial Process Optimization (RPO) Actions at Sites SD031, FT004, and FT005* (CH2M HILL, 2007).
[c] Cumulative total VOC vapor mass removed includes 4,860 pounds of petroleum hydrocarbon VOC mass removed and treated by a portable catalytic oxidizer system between 15 July and 17 September 2003.
[d] Costs include operations and maintenance, reporting, analytical laboratory, project management, and utility costs related to operation of the system. High costs are due to low influent groundwater concentrations and low flow rates.
[e] The rolling 12-month cost per pound of mass removed is calculated by the sum of the monthly cost over the past 12 months divided by the sum of pounds removed during the same period.

Flow Rates

Average Groundwater Total Flow Rate: **12.4 gpm**[a]

Location	Groundwater Flow Rate on 30 September 2008 (gpm)
EW565x31	Off line[b]
EW566x31	Off line[b]
EW567x31	Off line[b]
EW576x04	1.9
EW577x04	2.4
EW578x04	Off line[b]
EW579x04	Off line[b]
EW580x04	Off line[b]
EW621x04	3.1
EW622x04	1.6
EW623x04	2.0
EW614x07	1.0[c]
EW615x07	1.0[c]

[a] The flow rate was calculated using the effluent discharge totalizer divided by the operating time of the plant.
[b] Extraction well was shutdown for a one-year rebound study in December 2007 based on the *Work Plan for RPO Actions at Sites SD031, FT004, and FT005* (CH2M HILL, 2007).
[c] LF007 extraction wells were turned on for the dry season on 30 April 2008.
gpm = gallons per minute

Shutdown/Restart Summary

Location	Shutdown		Restart		Cause
	Date	Time	Date	Time	
NGWTP (water)	NA	NA	NA	NA	No shutdowns during the month of September 2008

NA = not applicable
NGWTP = North Groundwater Treatment Plant

Summary of O&M Activities

Monthly groundwater sampling at the NGWTP was performed on 2 September 2008. Sample results are presented in Table 1. The total VOC concentration (15.4 µg/L) in the influent sample has decreased since the August 2008 sample (18.4 µg/L). Several VOC constituents were detected in the influent sample. The SD031 extraction wells were shut down, and therefore, the indicator chemical for the site, 1,1-dichloroethene, was not detected. Methylene chloride, a common laboratory contaminant, was detected in the effluent sample. In addition, TPH-G was detected in the effluent sample at a concentration of 6.4 J µg/L.

Optimization Activities

On 4 December 2007, the six extraction wells (EW565x31, EW566x31, EW567x31, EW578x04, EW579x04, and EW580x04) were shut down for rebound testing. These extraction wells will remain off-line for one year. These wells were sampled in May 2008 as part of the annual GSAP event. At the end of the rebound period (Fourth Quarter 2008), the groundwater extraction wells will be sampled to assess rebound and plume stability. No other optimization activities were conducted in September 2008.

Table 1
Summary of Groundwater Analytical Data for September 2008 – North Groundwater Treatment Plant

Constituent	Instantaneous Maximum[a] (µg/L)	Detection Limit (µg/L)	N/C	2 September 2008 (µg/L)	
				Influent	Effluent
Halogenated Volatile Organics					
Bromodichloromethane	5.0	0.17	0	0.74	ND
Bromoform	5.0	0.19	0	1.5	ND
Carbon Tetrachloride	0.5	0.19	0	ND	ND
Chloroform	5.0	0.16	0	1.3	ND
Dibromochloromethane	5.0	0.17	0	0.56	ND
1,1-Dichloroethane	5.0	0.16	0	ND	ND
1,2-Dichloroethane	0.5	0.13	0	ND	ND
1,1-Dichloroethene	5.0	0.14	0	ND	ND
cis-1,2-Dichloroethene	5.0	0.15	0	0.28 J	ND
trans-1,2-Dichloroethene	5.0	0.15	0	ND	ND
Methylene Chloride	5.0	0.32	0	0.35 J	0.34 J
Tetrachloroethene	5.0	0.20	0	ND	ND
1,1,1-Trichloroethane	5.0	0.16	0	ND	ND
1,1,2-Trichloroethane	5.0	0.32	0	ND	ND
Trichloroethene	5.0	0.16	0	6.5	ND
Vinyl Chloride	0.5	0.40	0	ND	ND
Non-Halogenated Volatile Organics					
Benzene	1.0	0.16	0	ND	ND
Ethylbenzene	5.0	0.16	0	ND	ND
Toluene	5.0	0.17	0	ND	ND
Xylenes	5.0	0.19 – 0.34	0	ND	ND
Other					
Total Petroleum Hydrocarbons – Gasoline	50	4.9	0	NM	6.4 J
Total Petroleum Hydrocarbons – Diesel	50	32	0	NM	ND
Total Dissolved Solids (mg/L)	NE	4.7	0	NM	1,800

[a] 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).

J = analyte concentration is considered an estimated value
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

Triad Approach at Travis AFB

What is the Triad Approach?

- An adaptive approach that relies on “real-time” decision-making to guide work
- The three key Triad concepts:
  - Systematic planning
  - Dynamic work plan
  - Real-time data

Systematic Planning

- Clearly-defined objectives
- Multidisciplinary team: Travis AFB, regulatory agencies, USACE, CH2M HILL, ITSI
- Uncertainty management: Data quality sufficient to make the decision
- Conceptual site model:
  - what do we know already?
  - what are the data gaps?

Dynamic Work Plan

- Move from large, prescriptive, static plans to smaller, adaptive, iterative plans
- Plan specifies overall approach, identifies decision points
- Incorporates observational approach
- Relies on information-sharing during the investigation
- Team makes decisions as we go

Real-Time Analysis

- Real-time information to support rapid decision-making
- Data quality adjusted to the decision that needs to be made
- Examples:
  - Gore-Sorber
  - Fast turnaround analyses or on-site labs
  - Field instruments

Triad Approach at Travis

- Part of a larger vision that relies on partnership, team work, collaboration
- Would like to use this approach on all aspects of the program
- Focus on working together to get the job done
- Good example: the bioreactor project at DP039

Triad Approach at Travis

- We'll give you as much heads up as possible
- We'll try to present the work to you before you review it
- Incoming:
  - ST027 Characterization Work Plan
  - LF008 Rebound Study Technical Memorandum
  - LF007C Characterization Work Plan

Site Investigation at Site ST027

Travis Air Force Base

California

ST027 Site Description

- Located in WIOU
  - Site uses: Aircraft/jet engine testing and fuel storage
  - Surface cover: Unpaved areas are low quality grass land – grass mowed/disked (Bird Aircraft Strike Hazard zone)

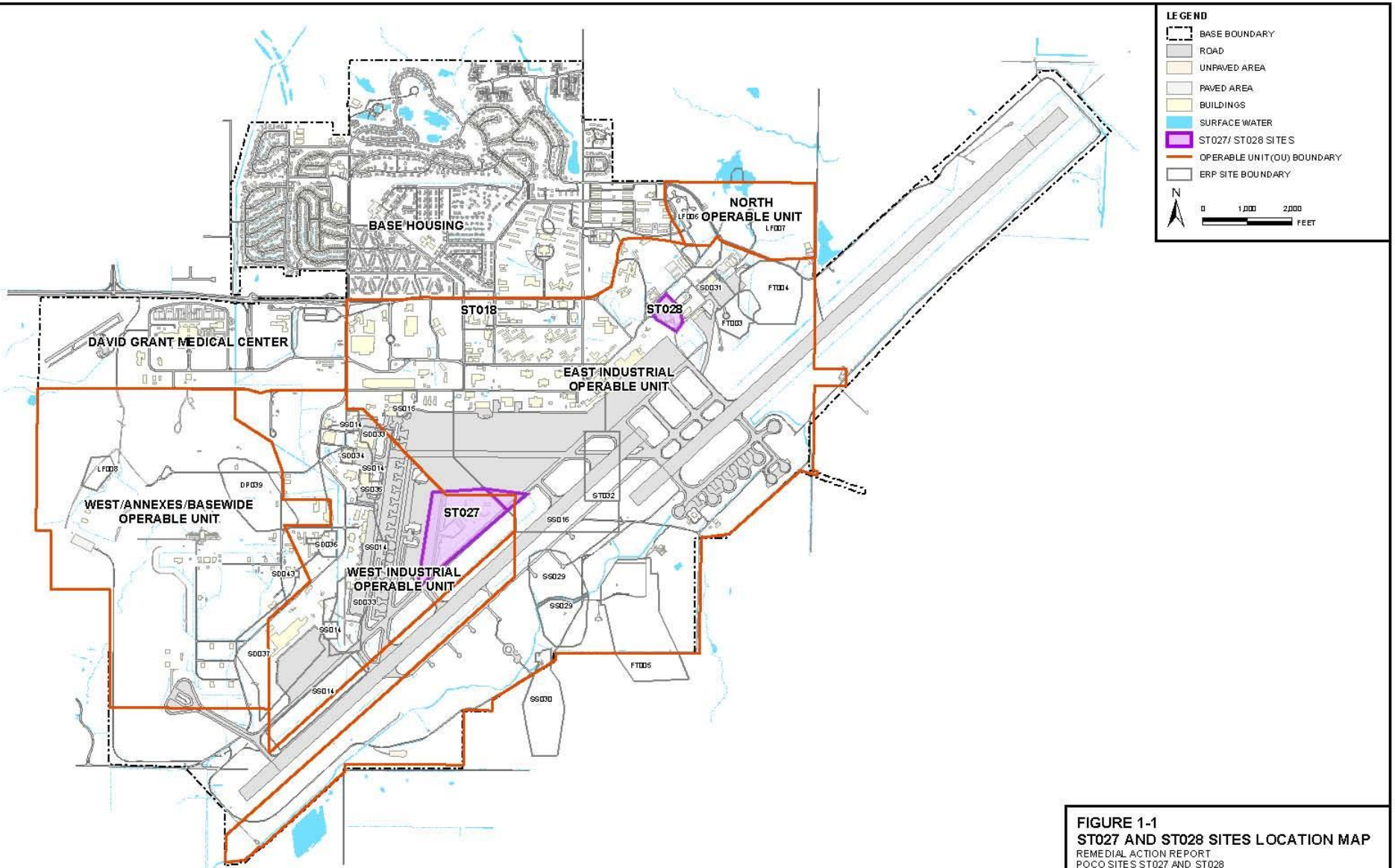

FIGURE 1-1
ST027 AND ST028 SITES LOCATION MAP
REMEDIAL ACTION REPORT
POCO SITES ST027 AND ST028
TRAVIS AIR FORCE BASE, CALIFORNIA

CH2MHILL

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ST027 Hydrogeology

- Thin aquifer in alluvium/weathered bedrock
  - Alluvium: Sandy silt and sandy clay
  - Bedrock: Markley Sandstone
- NW/SE trending bedrock ridge
- Semi-radial groundwater flow away from bedrock ridge

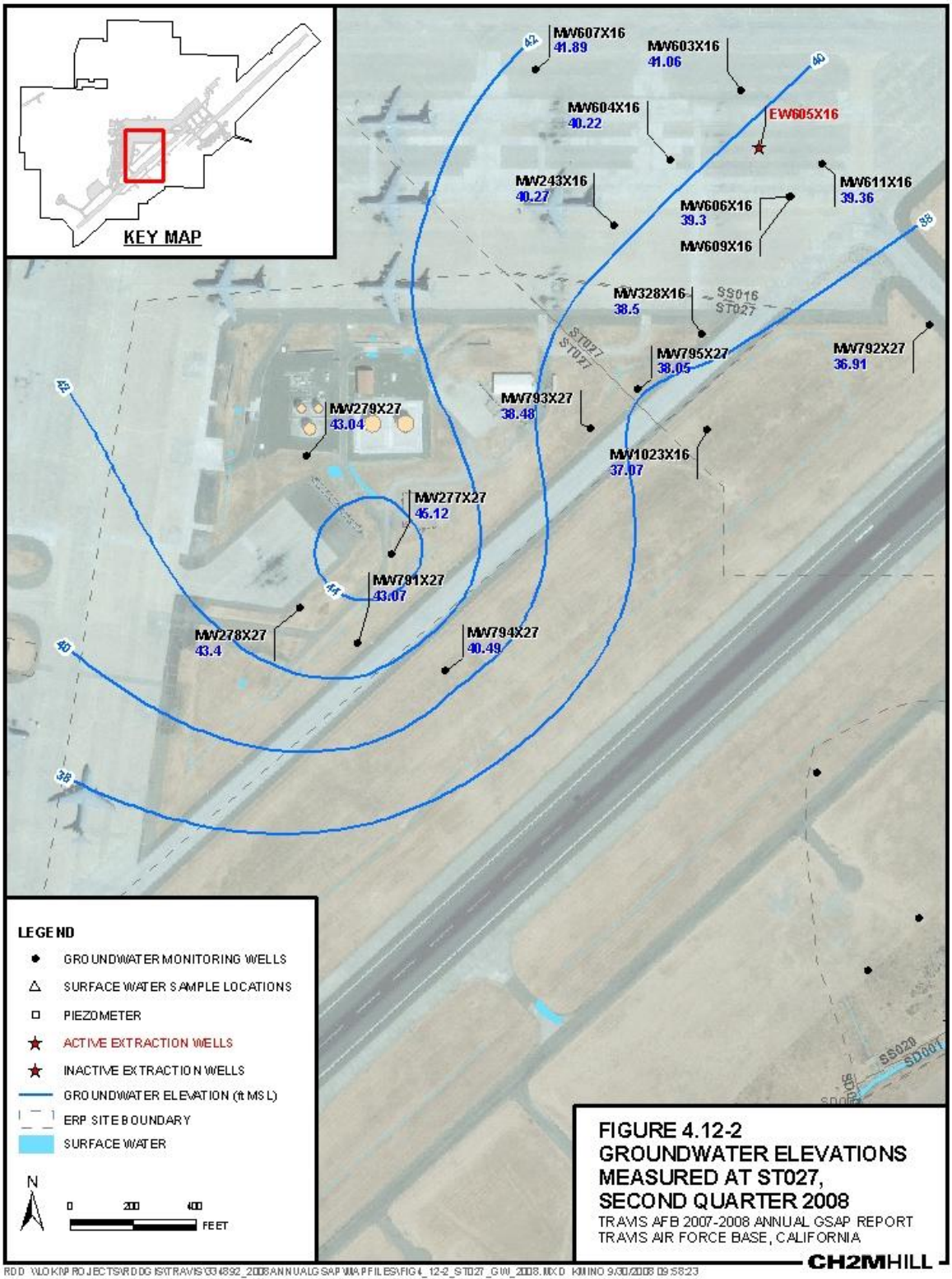

FIGURE 4.12-2
GROUNDWATER ELEVATIONS MEASURED AT ST027, SECOND QUARTER 2008
TRAVIS AFB 2007-2008 ANNUAL GSAP REPORT
TRAVIS AIR FORCE BASE, CALIFORNIA

CH2MHILL

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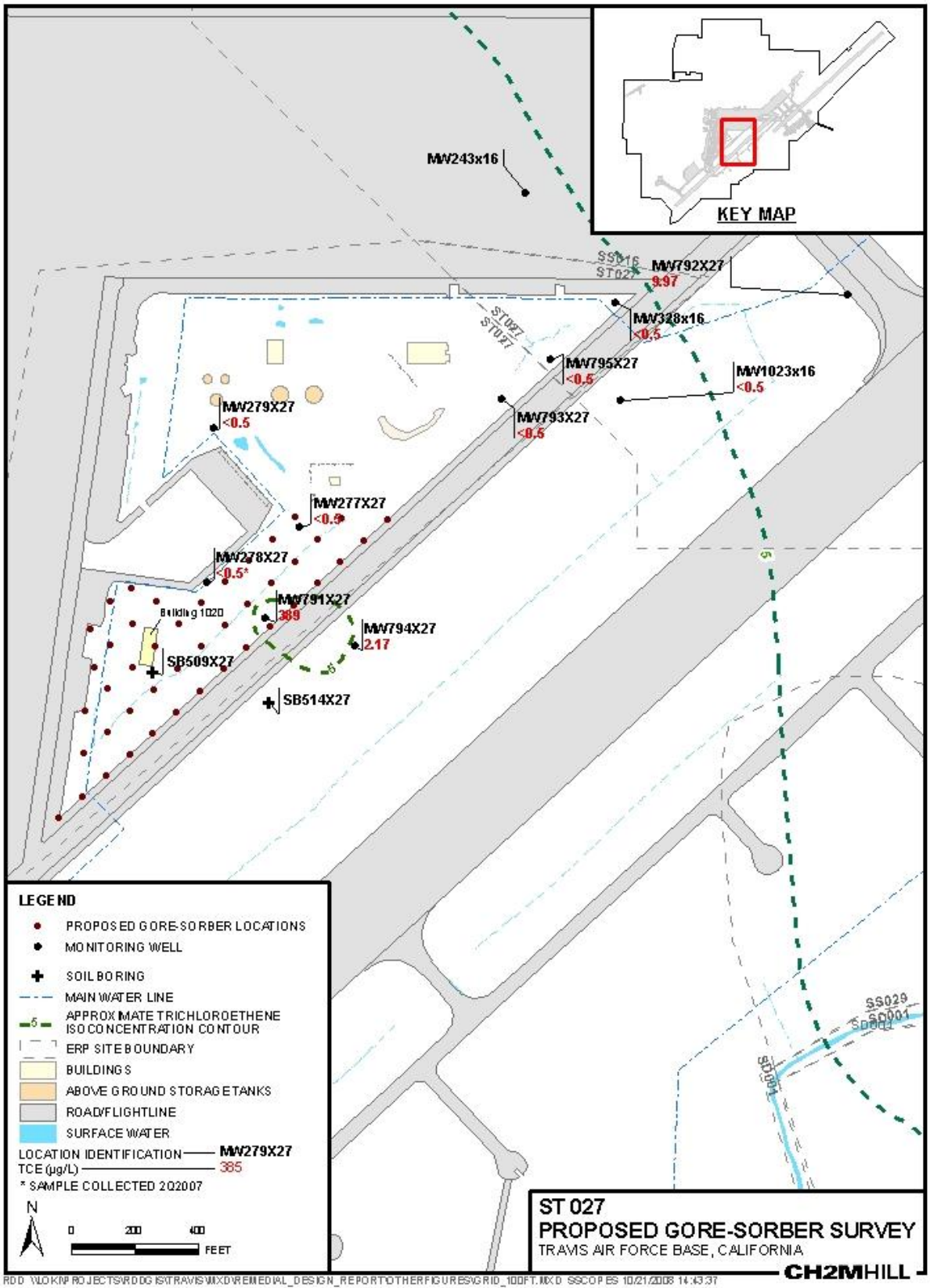
ST027 VOCs

- WIOU RI (1996) - ST027 removed from CERCLA; placed in POCO program because fuel hydrocarbons were only identified contaminants
- Several Investigations to define extent of fuel hydrocarbons – Most recent was a MNA study (2007-2008)
  - Established MNA as final remedy for fuel hydrocarbons
  - VOCs detected in groundwater at MW791x27 and MW794x27
  - TCE, cis-1,2-DCE, VC
- Preliminary Conceptual Model
  - Potential release mechanisms – surface spills, dumping
  - Potential release locations – Facility 1020 access road, drainage swale, Taxiway N



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Investigation Objectives and Approach

- Objectives
  - Identify TCE source area
  - Characterize extent of groundwater contamination
  - Support remedy selection
- Approach
  - Perform in stages
  - Meet periodically (review data, discuss next steps)

Example Implementation

Actions (~4 stages)

Draft Work Plan

Stage 1 – Passive SG investigation (Gore-Sorber).

Meetings (3 meetings)

First Meeting/Conf Call

- Finalize Work Plan
- Interpret Gore-Sorber results
- Select Stage 2 soil boring/hydropunch locations

Example Implementation

Actions (~4 stages)

Draft Work Plan

- Stage 1 – Passive soil gas investigation (Gore-Sorber).
  - Regulatory comment/acceptance today
  - Complete before rainy season

>>>>>>>>>>>>>>>>

Meetings (3 meetings)

First Meeting/Conf Call

- Finalize Work Plan
- Interpret Gore-Sorber results
- Select Stage 2 soil boring/hydropunch locations

Implementation (Cont.)

Stage 2

- Soil borings and hydropunch sampling >>>>>>>>>>>>>>>>>

2nd Meeting/Conf Call

- Evaluate Stage 2 results
- Select Stage 3 step-out soil boring/hydropunch locations
- Identify borings to convert to monitoring wells

Implementation (Cont.)

Stage 3

- Soil borings and hydropunch locations
- Monitoring wells (if needed)

>>>>>>>>>>>>>>>>>

Stage 4

- Install final monitoring wells

3rd Meeting/Conf Call

- Evaluate Stage 3 results
- Select Stage 4 monitoring well locations (if needed)

Reporting

- Investigation results and evaluation of nature and extent of VOCs – ST027 Site Characterization Report
- Groundwater Focused Feasibility Study

Site LF008 Rebound Study Technical Memorandum

Travis Air Force Base

California

LF008 Site Background

- Chlorinated pesticide contamination—Alpha-Chlordane most prevalent.
- Three-well extraction system installed and brought online in June 2001. Extracted groundwater transferred to CGWTP for treatment and discharge.
- Historical extraction rate from all three extraction wells is about 3 – 4 gpm.
- Highest initial contamination level of Alpha-Chlordane was 0.847μg/L in 2001. IRG is 0.01μg/L for Alpha Chlordane.

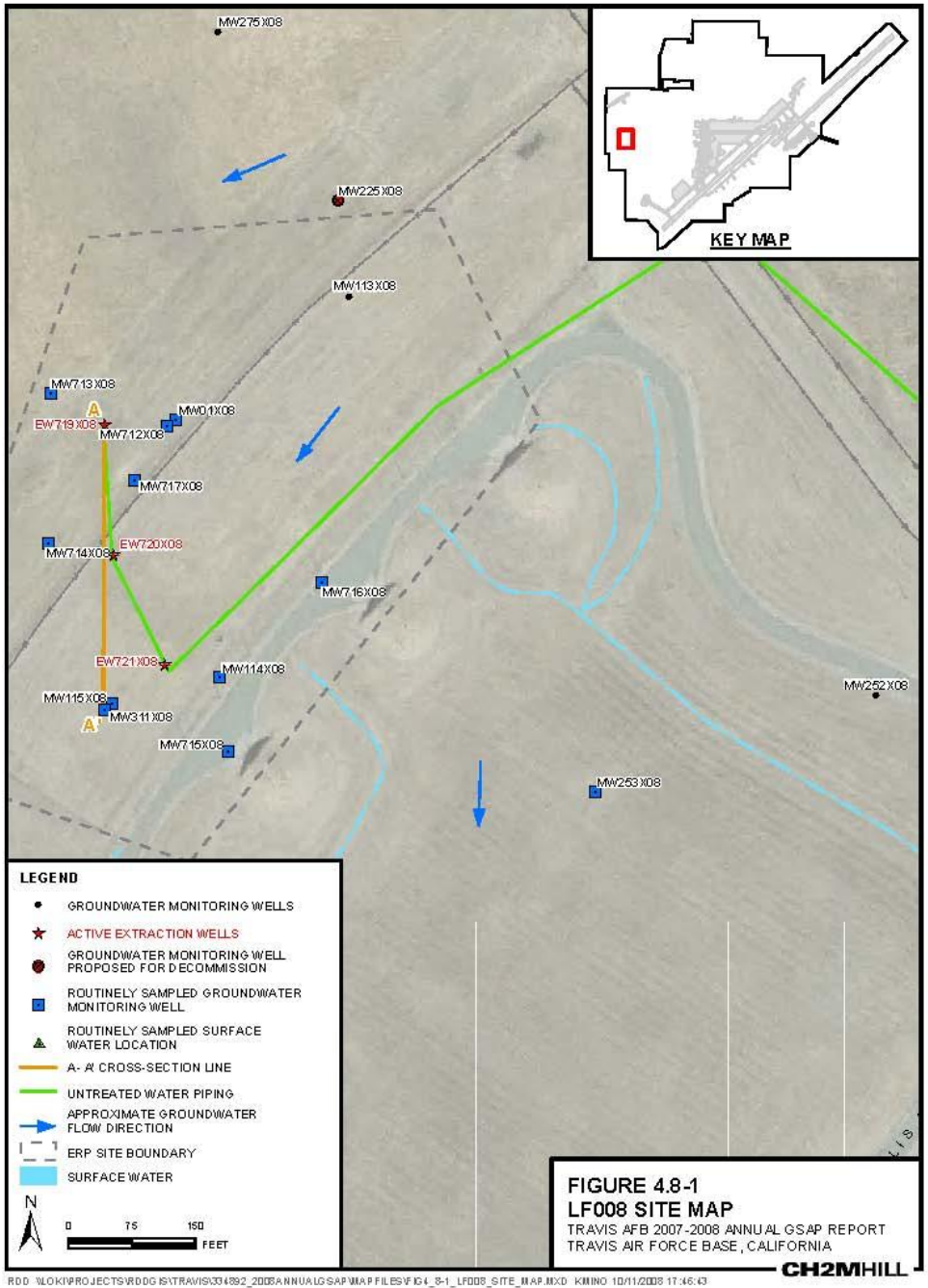

FIGURE 4.8-1
LF008 SITE MAP
TRAVIS AFB 2007-2008 ANNUAL GSAP REPORT
TRAVIS AIR FORCE BASE, CALIFORNIA

CH2MHILL

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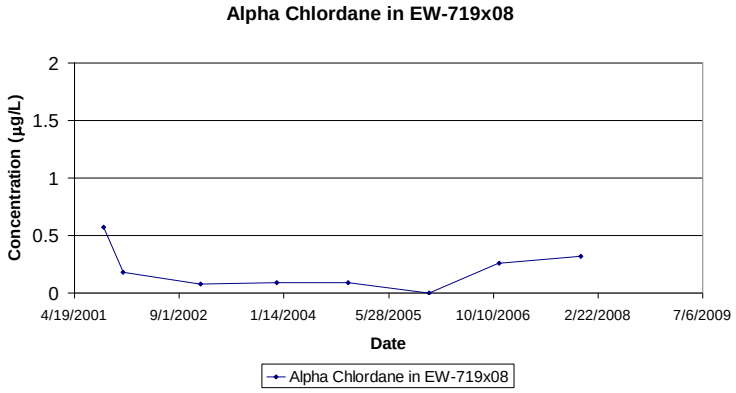
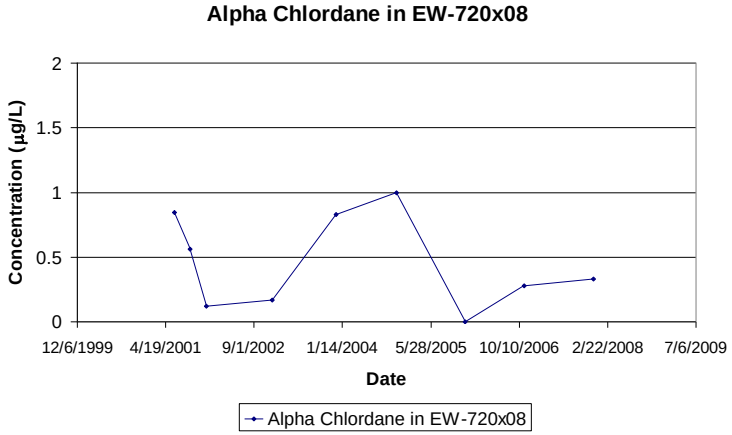
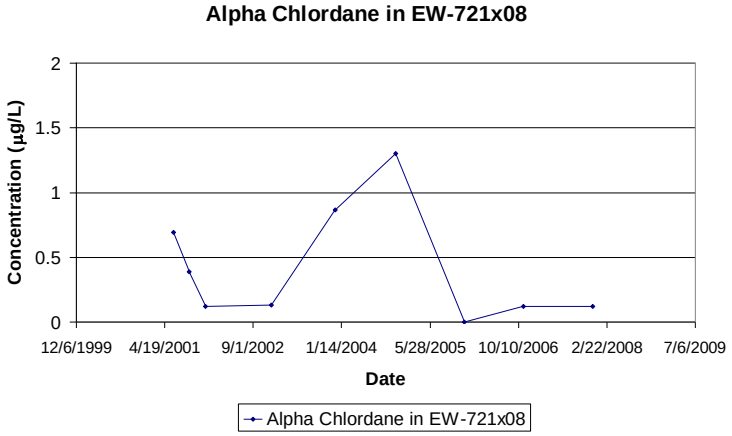
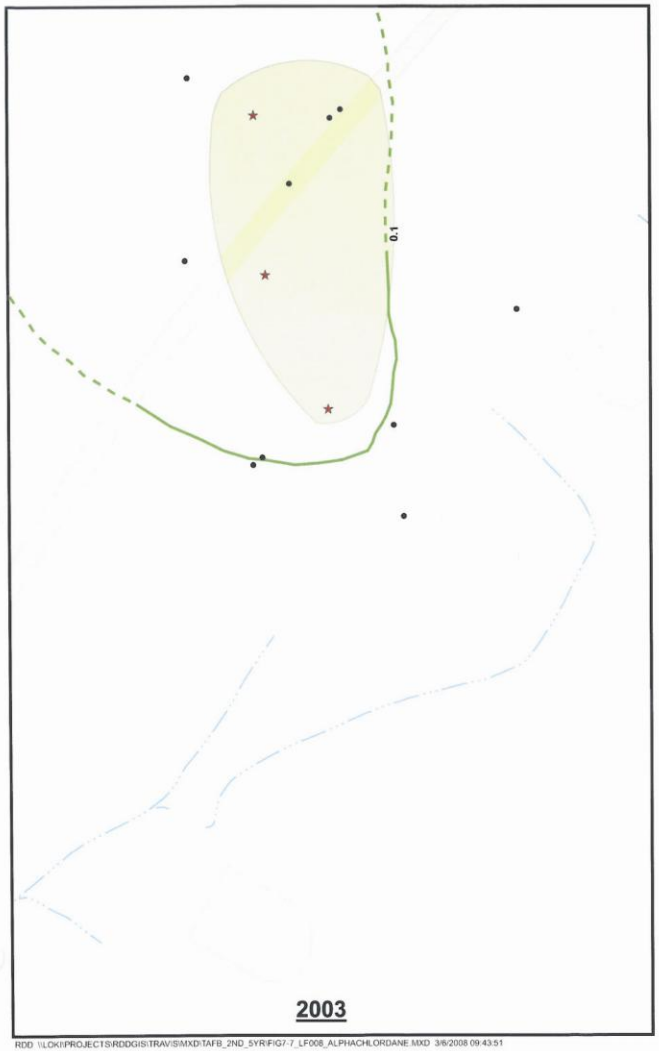
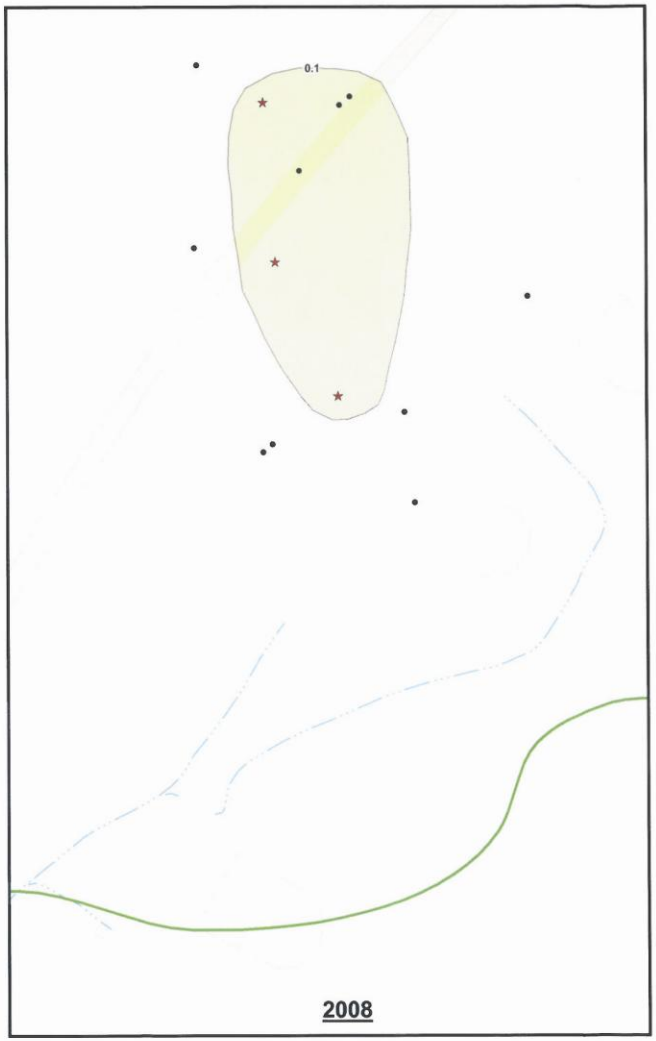
Alpha-Chlordane in LF008 Extraction Wells

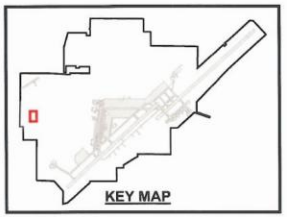












LEGEND

- PIEZOMETER
- GROUNDWATER MONITORING WELL
- EXTRACTION WELL
- 5 APPROXIMATE ISOCONCENTRATION CONTOURS (µg/L)
- APPROXIMATE EXTENT OF HYDRAULIC CAPTURE (DASHED WHERE LESS CERTAIN)
- ALPHA CHLORDANE ≥ 0.1 µg/L
- BUILDINGS
- UNPAVED AREA
- PAVED AREA
- ROAD
- SURFACE WATER

GROUNDWATER IRA:
MIGRATION CONTROL

N

0 50 100
FEET

RDD \\LOKI\PROJECTS\RDDGIS\TRAVIS\MXD\TAFB_2ND_5YR\FIG7-7_LF008_ALPHACHLORDANE.MXD 3/6/2008 09:43:51

FIGURE 7-7
WEST IRA - SITE LF008
ALPHA CHLORDANE DISTRIBUTION
2003 TO 2008
SECOND FIVE-YEAR REVIEW
TRAVIS AIR FORCE BASE, CALIFORNIA

CH2MHILL

Proposed LF008 Rebound Study

- Turn off all three extraction wells in December 2008.
- Resample extraction wells in June 2009 as part of the annual GSAP sampling event.
- Compare analytical results with historical data from previous LF008 sampling events.

LF008 Rebound Study - Reasoning

- Source of pesticide contamination excavated and disposed. Residual contamination below residential standards.
- Pesticide COCs have affinity for soil/clay adsorption
- Groundwater extraction has little impact on residual pesticide concentrations in groundwater.
- Rebound study will support the selection of remedial alternatives in the upcoming Feasibility Study