Final

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

21 April 2011, 1300 Hours

Mr. Mark Smith, Travis Air Force Base (AFB), conducted the Remedial Program Manager's (RPM) meeting on 21 April 2011 at 1300 in the Main Conference Room, Building 570, Travis AFB, California. Attendees included:

• Mark Smith	Travis AFB
• Glenn Anderson	Travis AFB
• Lonnie Duke	Travis AFB
• Gregory Parrott	Travis AFB
• Dezso Linbrunner	United States Army Corp of Engineers (USACE), Omaha District
• Alan Friedman	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)
• Mary Snow	Techlaw, Inc
• Rachel Hess	ITSI
• Riz Sarmiento	ITSI
• Mike Wray	CH2M HILL
• Doug Berwick	CH2M HILL

Handouts distributed at the meeting and presentations included:

• Attachment 1	Meeting Agenda
• Attachment 2	Master Meeting and Document Schedule
• Attachment 3	SBBGWTP Monthly Data Sheet (March 2011)
• Attachment 4	CGWTP Monthly Data Sheet (March 2011)
• Attachment 5	Site ST018 Monthly Data Sheet (March 2011)
• Attachment 6	Presentation: Management Overview Briefing: Activities Completed, In Progress and Upcoming
• Attachment 7	Presentation: 2011 Field Schedule Update
• Attachment 8	Presentation: 2010 Annual RPO Report

- Attachment 9 Presentation: Clarifying the Document Maze (BIR, RPO, GSAP, etc.)
- Attachment 10 Presentation FT005 Data Gaps Investigation Report

1. ADMINISTRATIVE

A. Previous Meeting Minutes

The 16 March 2011 RPM meeting minutes were approved and finalized as written.

B. Action Item Review.

Action items from March were reviewed.

Action item one still open. No change.

Action item two still open. No change.

Action item three still open. No change.

Action item four still open. Scheduled for 26 May 2011, after the RPM meeting.

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 26 May 2011.

Travis AFB Master Document Schedule

— Focused Feasibility Study (FFS): The response to comments (RTC) meeting date has been changed: to be determined (TBD), due to the size of the document and ongoing discussions with the regulatory agencies.

— Proposed Plan (PP): The predraft submittal date was moved to 04 May 2011 to allow for Air Force legal review.

— Groundwater Record of Decision (ROD): No change.

— Comprehensive Site Evaluation Phase II: RTC, Draft Final Due, and Final Due dates have changed to TBD. Travis and Army Corp of Engineers are working together to address EPA Comments. A teleconference may need to be scheduled to focus on EPAs Comments.

— Potrero Hills Annex: (FS, PP, and ROD): No change.

— ISCO/ERD Technical Memorandum: No Change. EPA is reviewing the first set of the Air Force responses to comments (RTCs); Travis is addressing the

second set of EPAs comments. A teleconference may need to be scheduled to focus on EPAs Comments. RTC and Final due date is subject to change. DTSC and RWQCB had no comments.

- Site SS015 Field Implementation Plan: Final. Move to History.
- Sites SS014 and ST032 Tier 1 POCO Evaluation Report: No change.
- Site FT005 Data Gaps Investigation Report: RTC date was changed to align with the June RPM meeting date change.
- Site ST018 POCO Baseline Implementation Report: No change. RTC date is TBD.
- Site SD036 RPO Field Implementation Plan: RTC and Final Due dates have been changed to TBD. Travis is addressing the final comments.
- 2010 GWTP RPO Annual Report: This is a new report, so all due dates were added to the schedule. This document will incorporate discussion of the treatment plants, optimization measures, and performance monitoring in one document.
- Baseline Implementation Report: This is a new report, so all due dates were added to the schedule. This report will document the site investigations, remedy optimization actions, and baseline sampling results for the emulsified vegetable oil (EVO) injection sites and bioreactor sites.
- Technical and Economic Feasibility Analysis (TEFA): No change.
- Quarterly Newsletter (January 2011): Published as scheduled.
- 2009/2010 GSAP: Final. Move to History.
- 2010 CAMU Annual Report: No change. Travis waiting for comments from DTSC and RWQCB.

2. CURRENT PROJECTS

Treatment Plant Operation and Maintenance Update

Mr. Duke 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 3.5 million gallons of groundwater were extracted and treated during the month of March 2011. All of the treated water was discharged to Union Creek. The average flow rate for the SBBGWTP was 89.2 gallons per minute (gpm), and electrical power usage was 12,840 kWh. Approximately 17,591 pounds of CO_2 were created (based on DOE calculation); approximately 1.62 pounds of volatile

organic compounds (VOCs) were removed in March. The total mass of VOCs removed since the startup of the system is 397 pounds.

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

Central Groundwater Treatment Plant (see Attachment 4)

The Central Groundwater Treatment Plant (CGWTP) performed at 95.3% uptime with approximately 1.2 million gallons of groundwater extracted and treated during the month of March 2011. All treated water was diverted to the storm drain. The average flow rate for the CGWTP was 27.5 gpm, and electrical power usage was 100 kWh for all equipment connected to the Central plant; approximately 137 pounds of CO_2 were created. Approximately 4.23 pounds of VOCs were removed from groundwater in March. The total mass of VOCs removed since the startup of the system is 11,219 pounds.

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

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

Mr. Salcedo asked if carbon can absorb vinyl chloride. Mr. Berwick said the carbon does not absorb vinyl chloride (VC) very well. The VC detection has been sporadic and the causes are unknown.

North Groundwater Treatment Plant

The North Groundwater Treatment Plant (NGWTP) remains shut down for the wet season. Operation of the North Plant was suspended due to the presence of vernal pools in the area of Site LF007C.

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

The Site ST018 (MTBE) Treatment Plant (S18GWTP) was brought on line on 11 March 2011 and performed at 100% uptime with approximately 82 thousand gallons of groundwater extracted and treated during the month of March 2011. All treated water was diverted to the storm drain. The average flow rate for the S18GWTP was 3.33 gpm, and electrical power usage was 65 kWh for all equipment connected to the S18GWTP plant; approximately 89 pounds of CO2 were created. Approximately 2.2 pounds of BTEX, MTBE, TPH mass were removed from groundwater in March. The total BTEX, MTBE, TPH mass removed since the startup of the system is 2.2 pounds.

Note: electrical power use is for the alarm system and a pump that pushes water through the GAC.

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

3. Presentations

Program Update: Activities Completed, In Progress and Upcoming (see Attachment 6)

Mr. Wray reported on the status of field work and documents which are completed, in progress, and upcoming. See Attachment 6 for details.

Mr. Anderson proposed to Mr. Friedman that the RWQCB defer to EPA and DTSC to take the lead on reviewing FT005 Data Investigation Gap Report; due to the amount of documents that RWQCB already have in their queue for review. Mr. Friedman agreed and requested an electronic copy of the report.

Field Schedule (see Attachment 7)

Mr. Wray reported on the 2011 field schedule. See Attachment 7 for details.

2010 Annual RPO Report (see Attachment 8)

Mr. Berwick gave the presentation on the 2010 Annual Remedial Process Optimization (RPO) Report.

Key points made in this presentation included:

Mr. Berwick started by introducing the scope of the document and the related reports. This document describes system optimization activities: EVO injections, Bioreactors, Rebound studies, etc. It will allow the user easy access to specific data without having to filter through different reports.

Mr. Berwick gave a summary of the 2010 optimization activities for the CGWTP, SBBGWTP, and NGWTP. Mr. Wray added that analytical data from the quarterly/semi-annual EVO and bioreactor sampling events will also be included in the monthly groundwater treatment plant reports as the data becomes available. Highlights include:

- ThOx and UV Ox systems at Site SS016 taken offline.
- DP039, SS015, SD037, and SD036 emulsified vegetable oil (EVO) injections.
- Installed second bioreactor at site SS016. First bioreactor was installed at DP039 in late 2008.
- Installed solar panels for power where applicable.
- Treatment by air stripping replaced with treatment by LGAC.
- Rebound studies at several different sites.

Actions for system optimization in 2011:

- Continue all current groundwater rebound studies.
- After sampling the WIOU vapor extraction wells in 2nd quarter 2011, consider restarting those wells that may show significant rebound.
- Conduct the planned site characterization at Site LF007C
- Monitor TCE plume mobility at Site SS030 for a possible upgrade of extraction system.

Details of this presentation are provided in attachment 8.

Clarifying the Document Maze: BIR, RPO, GSAP, etc. (see Attachment 9)

Mr. Wray gave the presentation on clarifying the document maze.

Key points made in this presentation included:

Mr. Wray described the development of the various reports that the regulatory agencies have received and their relationships leading to groundwater remedy selection and the ROD.

- Evaluation of the interim remedies: two 5 year reviews; the last review was in 2008. The reviews thoroughly evaluate the performance of the whole program.
- Data Gaps Investigation: Define plumes, hot spots.
- Optimization of existing remedial systems and interim remedies.
- Transition Period Documents: Monthly RPO Data Sheets, Annual RPO Reports, Annual GSAP Reports, Baseline Implementation Report, Natural Attenuation Assessment Report, Vapor Intrusion Assessment Report, Annual Land Use Control Reports, Focused Feasibility Study.

Mr. Wray provided a flow chart of the reports and how the relationships lead to the PP/ROD. (See attachment 9 for details)

Side note: Mr. Wray mentioned briefly about the FTP site and SharePoint site; where documents can be accessed. Ms. Taylor/CH2M HILL will contact the group with details on how to access documents using SharePoint in the near future.

FT005 Data Gaps Investigation Report (see Attachment 10)

Ms. Hess gave the presentation on the FT005 Data Gaps Investigation Report.

Key points made in this presentation included:

Ms. Hess began by giving the background of site FT005 (a soil and groundwater site). A former fire training area located in the southeastern portion of Travis AFB, Site FT005 was in operation from 1962 to 1987. From 1962 to the early 1970's waste

fuels, oils, and solvents were burned during the fire training exercises. In the mid 1970's only waste fuels were burned in the fire training exercises. In the early 1990's the northern portion of site FT005 was used for dumping miscellaneous debris like fencing and concrete.

In 1995 a remedial investigation (RI) was conducted and identified PAHs, PCBs, dioxin, VOCs, metals, and TPH as potential chemicals of concern (COC) for soil; a feasibility study (FS) was also completed at this site. In 2004 a human health tech memo was issued that found only soils containing PAH's contamination required cleanup to protect human health at this site. Based on the data that was gathered, the North, East, and West Industrial Operating Unit (NEWIOU) record of decision (ROD) was issued in 2006; it selected excavation of FT005 soils containing concentrations of PAH's that posed a potential for human health risk. The Soil, Sediment and Surface Water NEWIOU ROD further identified land use controls for PCB's, dioxin, and TPH's concentrations that exceeded levels that allowed unrestricted use at this site. No action was deemed necessary for VOC's or metals. In 2007, a soil remedial design and remedial action work plan (RAWP) were issued to support implementation of the remedy that was identified in the ROD.

In September 2007 excavation activities began. The initial excavation exposed rubble, asphalt, concrete, tires, fencing, petroleum, hydrocarbon-saturated soil and miscellaneous debris within area A (a map is included in the attachment). This significantly increased the level of cleanup effort to complete what was required for the RAWP. Excavation activities were postponed due to time and funding issues until 2011. In May and June of 2010, a data gap investigation (DGI) was conducted to support regulatory concerns:

- Biological monitoring was performed during the potholing to protect any endangered species, like California Tiger Salamanders (none were observed).
- Pothole locations were established using a 50 ft. grid in areas, A, B and C; a 100 ft. grid for the rest of the targeted area.
- The site was surveyed and cleared for underground utilities.
- Fifty four pothole locations were excavated down to 6 ft.; eight of those locations were excavated down to 18 ft. Based on PID (air monitor) readings.
- Samples were collected from each pothole at depths of: 1.5 to 2 ft., 3.5 to 4 ft. and, 5.5 to 6 ft. Additional samples were taken from 8 to 14 ft. for the deeper potholes.
- One hundred percent of the samples were analyzed for PAH's and TPHd/TPHmo, fifty percent of the samples were analyzed for PCB's, and ten percent of the samples were analyzed for VOC's, dioxins and metals. See attachment 10 for analytical results.
- Debris consisted primarily of concrete rubble, chunks of asphalt, wood, scrap metal, and miscellaneous trash.

- No saturated soil or free product was observed, with the exception of a single 5 gallon drum of oil.

An addendum to the 2007 FT005 final RAWP has been prepared to support excavation of the additional soil volume identified by the DGI. (See attachment 10 for details)

Mr. Salcedo asked if the volumes for the dioxin concentrations are based on the 2004 preliminary remediation goals (PRG) detection limit standards. Ms. Hess said yes, that they are going by the PRG 2004 detection limits, adding that the current PRGs are less stringent.

4. New Action Item Review

There are no new action items.

5. PROGRAM/ISSUES/UPDATE

None.

General Discussion

None.

7. Action Items

Item #	Responsible	Action Item Description	Due Date	Status
1.	Travis AFB	Petition to have the Lysimeter removed.	TBD	Open
2.	Travis AFB	Research beneficial reuse of treated water and give update.	TBD	Open
3.	Travis AFB and EPA	Review past site closure completion reports to determine if future site closure reports are necessary.	TBD	Open

4.	Travis AFB	Schedule site visit for Ms. Burke to observe PDB sampling procedure.	26 May 2011	Open – The field observation was scheduled to follow the May RPM meeting.

TRAVIS AIR FORCE BASE
ENVIRONMENTAL RESTORATION PROGRAM
REMEDIAL PROGRAM MANAGER'S MEETING
BLDG 570, Main Conference Room
21 April 2011, 1:00 P.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 (LONNIE)

3. PRESENTATIONS

   A. PROGRAM UPDATE: ACTIVITIES COMPLETED, IN PROGRESS AND UPCOMING
   B. 2011FIELD SCHEDULE
   C. 2010 ANNUAL RPO REPORT
   D. OVERVIEW OF REPORTS (BIR. RPO, GSAP, ETC)
   E. FT005 DATA GAPS INVESTIGATION REPORT

4. NEW ACTION ITEM REVIEW

5. PROGRAM/ISSUES/UPDATE

NOTE: WE HAVE SET ASIDE THE 10 O'CLOCK TO 12 O'CLOCK TIMEFRAME TO DISCUSS POTENTIAL WAYS TO RESPOND TO EPA COMMENTS ON THE DRAFT FOCUSED FEASIBILITY STUDY AND POSSIBLY THE ISCO/ERD TECHNICAL MEMORANDUM, IF NEEDED. INSTEAD OF A TRADITIONAL RESPONSE-TO-COMMENTS MEETING WHERE THE AIR FORCE HAS ALREADY DRAFTED PRELIMINARY RESPONSES, THE PURPOSE OF THIS MEETING IS TO CLARIFY THE INTENT OF GENERAL COMMENTS AND PROPOSE WAYS TO ADDRESS SPECIFIC COMMENTS. STATE REPRESENTATIVES ARE WELCOME TO ATTEND.

Travis AFB Master Meeting and Document Schedule

Annual Meeting and Teleconference Schedule

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.)
01-26-11	—	—
02-16-11	—	—
03-16-11	—	—
04-21-11 (1:00 PM)	—	04-21-11
05-26-11	—	—
06-15-11	—	—
07-20-11	—	—
08-17-11	—	—
09-21-11	—	—
10-20-11 (1:00 PM)	—	10-20-11
11-30-11	—	—
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Travis AFB Master Meeting and Document Schedule

PRIMARY DOCUMENTS			
Life Cycle	**Basewide Groundwater**		
	Focused Feasibility Study Travis, Glenn Anderson CH2M Hill, Loren Krook	**Proposed Plan Travis, Glenn Anderson CH2M HILL, Loren Krook**	**Record of Decision Travis, Glenn Anderson CH2M HILL, Tony Jaegel**
Scoping Meeting	**03-30-10**	**NA**	**01-24-07**
Predraft to AF/Service Center	12-30-10	05-04-11	12-08-11
AF/Service Center Comments Due	01-13-11	05-27-11	01-11-12
Draft to Agencies	01-27-11	06-10-11	01-25-12
Draft to RAB	01-27-11	06-10-11	01-25-12
Agency Comments Due	03-31-11	08-09-11	03-28-12
Response to Comments Meeting	**TBD**	**08-17-11**	04-18-12
Agency Concurrence with Remedy	NA	NA	05-09-12
Public Comment Period	NA	10-13-11 to 11-14-11	NA
Public Meeting	**NA**	***10-20-11**	**NA**
Response to Comments Due	06-01-11	09-01-11	05-29-12
Draft Final Due	06-01-11	09-13-11	05-29-12
Final Due	07-01-11	10-13-11	06-27-12

*Public meeting to coincide with RAB meeting.

Travis AFB Master Meeting and Document Schedule

PRIMARY DOCUMENTS	
	Comprehensive Site Evaluation Phase II **Travis AFB, Glenn Anderson** **Sky Research, Ian Roberts**
Life Cycle	**Report**
Scoping Meeting	**NA**
Predraft to AF/Service Center	04-23-10
AF/Service Center Comments Due	05-04-10
Draft to Agencies	10-14-10
Draft to RAB	10-14-10
Agency Comments Due	11-24-10
Response to Comments Meeting	**TBD (teleconference)**
Agency Concurrence with Remedy	NA
Public Comment Period	NA
Public Meeting	**NA**
Response to Comments Due	TBD
Draft Final Due	TBD
Final Due	TBD

Travis AFB Master Meeting and Document Schedule

PRIMARY DOCUMENTS			
	Potrero Hills Annex Travis, Glenn Anderson		
Life Cycle	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	**ISCO/ERD Technical Memorandum Travis AFB, Glenn Anderson CH2M HILL, Loren Krook**	**Site SS015 Field Implementation Plan Travis AFB, Lonnie Duke CH2M HILL, Loren Krook**	**Sites SS014 and ST032 Tier 1 POCO Evaluation Report Travis AFB, Lonnie Duke CH2M HILL, Gavan Heinrich**	**Site FT005 Data Gaps Investigation Report Travis AFB, Lonnie Duke ITSI, Rachel Hess**
Scoping Meeting	**NA**	**NA**	**NA**	**NA**
Predraft to AF/Service Center	08-25-10	10-13-10	01-14-11	04-15-11
AF/Service Center Comments Due	09-08-10 (09-10-10)	10-27-10	01-24-11	04-29-11
Draft to Agencies	10-06-10	11-15-10	02-14-11	05-13-11
Draft to RAB	10-06-10	11-15-10	02-14-11	05-13-11
Agency Comments Due	11-05-10	12-15-10	03-16-11	06-13-11
Response to Comments Meeting	**04-21-11**	**03-16-11**	**04-21-11**	**06-15-11**
Response to Comments Due	05-10-11	03-16-11	04-29-11	07-07-11
Draft Final Due	NA	NA	NA	NA
Final Due	05-10-11	03-16-11	04-29-11	07-07-11
Public Comment Period	NA	NA	NA	NA
Public Meeting	**NA**	**NA**	**NA**	**NA**

Travis AFB Master Meeting and Document Schedule

SECONDARY DOCUMENTS					
Life Cycle	**Baseline Implementation Report POCO Site ST018** **Travis AFB, Lonnie Duke** **CH2M HILL, Gavan Heinrich**	**Site SD036 RPO Field Implementation Plan** **Travis AFB, Lonnie Duke** **CH2M HILL, Doug Berwick**	**2010 Groundwater RPO Annual Report** **Travis AFB, Lonnie Duke** **CH2M HILL, Doug Berwick**	**Baseline Implementation Report** **Travis AFB, Lonnie Duke** **CH2M HILL, Loren Krook**	**Technical and Economic Feasibility Analysis** **Travis AFB, Glenn Anderson** **CH2M HILL, Loren Krook**
Scoping Meeting	**NA**	**NA**	**NA**	**NA**	**NA**
Predraft to AF/Service Center	04-18-11	11-30-10	04-05-11	04-28-11	06-15-11
AF/Service Center Comments Due	05-02-11	12-10-10	04-19-11	05-12-11	06-25-11
Draft to Agencies	05-16-11	02-03-11	05-17-11	05-26-11	07-08-11
Draft to RAB	05-16-11	02-03-11	05-17-11	05-26-11	07-08-11
Agency Comments Due	06-15-11	03-05-11	06-16-11	06-28-11	09-06-11
Response to Comments Meeting	**TBD**	03-16-11	**07-20-11**	**07-20-11**	**09-21-11**
Response to Comments Due	07-06-11	TBD	08-23-11	08-03-11	10-11-11
Draft Final Due	NA	NA	NA	NA	10-11-11
Final Due	07-06-11	TBD	08-23-11	08-03-11	11-22-11
Public Comment Period	NA	NA	NA	NA	NA
Public Meeting	**NA**	**NA**	**NA**	**NA**	**NA**

Travis AFB Master Meeting and Document Schedule

INFORMATIONAL DOCUMENTS			
Life Cycle	**Quarterly Newsletters (April 2011) Travis, Glenn Anderson**	**2009/2010 Annual GSAP Travis AFB, Lonnie Duke CH2M HILL, Leslie Royer**	**2010 CAMU Annual Report Travis AFB, Lonnie Duke ITSI, Rachel Hess**
Scoping Meeting	**NA**	**NA**	**NA**
Predraft to AF/Service Center	NA	10-29-10	01-18-11
AF/Service Center Comments Due	NA	11-12-10	01-31-11
Draft to Agencies	03-29-11	12-07-10	03-01-11
Draft to RAB	NA	12-07-10	03-01-11
Agency Comments Due	04-07-11	02-01-11	04-01-11
Response to Comments Meeting	**TBD**	**03-16-11**	04-21-11
Response to Comments Due	04-12-11	04-04-11	05-04-11
Draft Final Due	NA	NA	
Final Due	04-12-11	04-04-11	05-04-11
Public Comment Period	NA	**NA**	**NA**
Public Meeting	**NA**	**NA**	**NA**

South Base Boundary Groundwater Treatment Plant Monthly Data Sheet

Report Number: 127 **Reporting Period: 28 February – 31 March 2011** **Date Submitted: 12 April 2011**

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

System Metrics

Table 1 – Operations Summary – March 2011

Operating Time:	Percent Uptime:	Electrical Power Usage:
SBBGWTP: 671 hours	**SBBGWTP:** 100%	**SBBGWTP:** 12,840 kWh (17,591 lbs CO_2 generated[a])

Gallons Treated: **3.5 million gallons**

Gallons Treated Since July 1998: **730 million gallons**

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

VOC Mass Removed: **1.62 lbs**

VOC Mass Removed Since July 1998: **397 lbs**

Rolling 12-Month Cost per Pound of Mass Removed: $4,003 [b]

Monthly Cost per Pound of Mass Removed: $4,399[b]

Lbs = pounds

[a] Calculated using March 2011 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.

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Table 2 – SBBGWTP Average Flow Rate (gpm)[a]

FT005[b]				SS029		SS030	
EW01x05	Off line	EW736x05	Off line	EW01x29	0.60	EW01x30	10.1
EW02x05	1.4	EW737x05	Off line	EW02x29	2.7	EW02x30	2.7
EW03x05	Off line	EW742x05	Off line	EW03x29	Off line[c]	EW03x30	3.3
EW731x05	Off line	EW743x05	Off line	EW04x29	6.5	EW04x30	24.1
EW732x05	Off line	EW744x05	Off line	EW05x29	12.2	EW05x30	7.7
EW733x05	Off line	EW745x05	Off line	EW06x29	11.8	EW06x30	Dry
EW734x05	8.6	EW746x05	Off line	EW07x29	17.4	EW711x30	10.0[d]
EW735x05	3.2						
FT005 Total:		**13.2**		**SS029 Total:**	**51.2**	**SS030 Total:**	**57.9**
SBBGWTP Average Monthly Flow[e]: 89.2 gpm							

[a] Extraction well flow rates are based on the average of the weekly readings.
[b] Extraction wells at FT005 were taken off line 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.*
[c] Extraction well is off line due to low VOC concentrations.
[d] Extraction well online, but has a faulty flow meter. Flow rate is measured at the well head.
[e] The average groundwater flow rate was calculated using the Union Creek Discharge Totalizer and dividing it by the operating time of the plant

gpm—gallons per minute
SBBGWTP – South Base Boundary Groundwater Treatment Plant

Table 3 – Summary of System Shutdowns

Location	Shutdown		Restart		Cause
	Date	Time	Date	Time	
SBBGWTP	None				

SBBGWTP = South Base Boundary Groundwater Treatment Plant

Summary of O&M Activities

Monthly groundwater samples at the SBBGWTP were collected on 7 March 2011. Sample results are presented in Table 4. The total VOC concentration (55.8 µg/L) in the influent sample has increased slightly since the February 2011 sample (50.6 µg/L) was collected.

Optimization Activities

No optimization activities occurred at the SBBGWTP in March 2011.

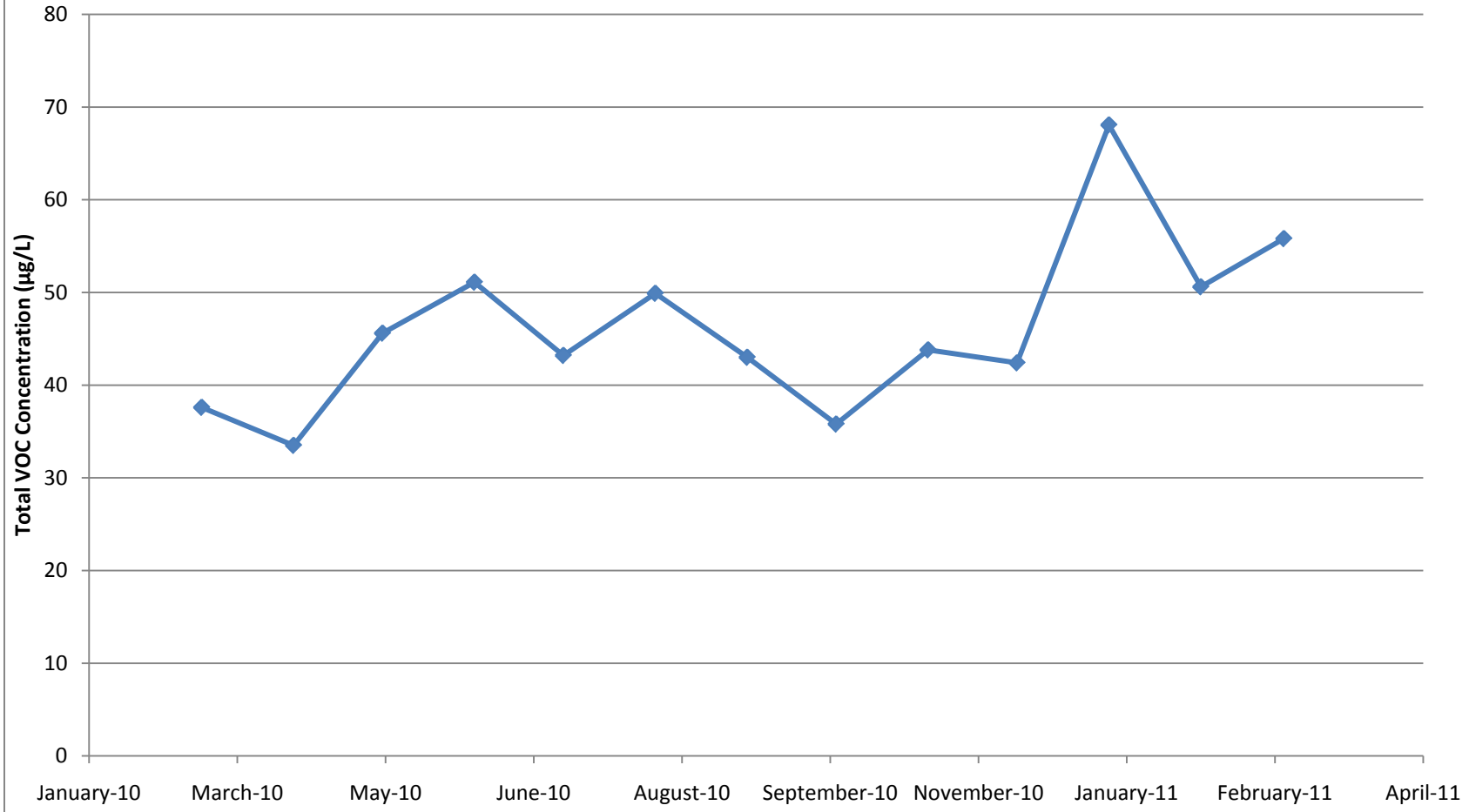
Table 4
Summary of Groundwater Analytical Data for March 2011 – South Base Boundary Groundwater Treatment Plant

Constituent	Instantaneous Maximum[a] (µg/L)	Detection Limit (µg/L)	N/C	7 March 2011 (µg/L) Influent	Midpoint	Effluent
Halogenated Volatile Organics						
Bromodichloromethane	5.0	0.15	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
1,1-Dichloroethane	5.0	0.19	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	3.4	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	0.20	0	ND	ND	ND
Trichloroethene	5.0	0.19	0	52.4	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 Suspended Solids (mg/L)	NE	1.0	0	44	NM	NM

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

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

Figure 1
SBBGWTP Total VOC Influent Concentrations
Travis Air Force Base, California



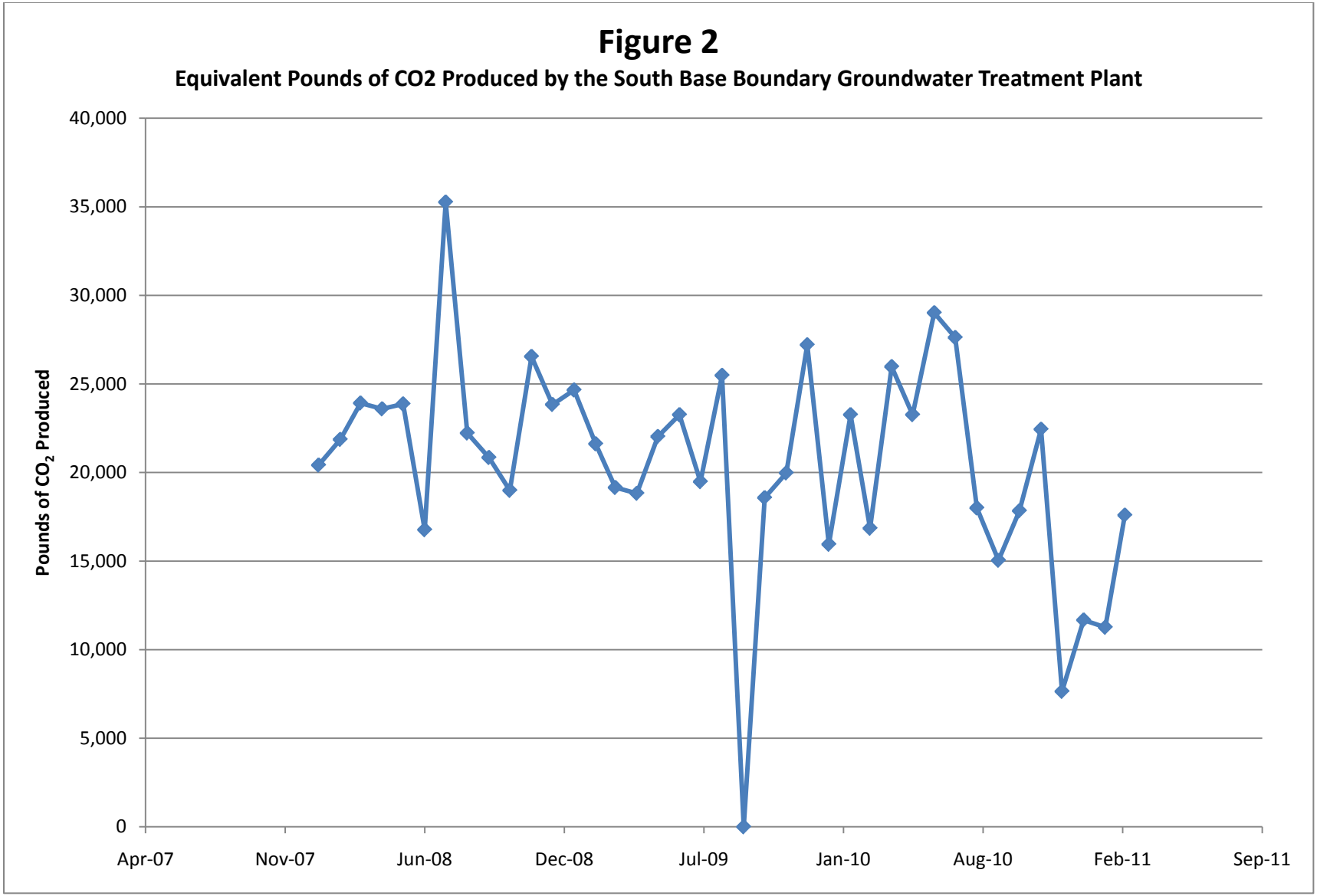
Sustainability

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 17,591 pounds of GHG during March 2011. This is an increase from February 2011, and is likely due to increased operating hours. Despite this increase, the overall energy consumption levels remain consistent with the general decrease since the air stripper was bypassed, and the granular activated carbon (GAC) system was brought on line.

Figure 2

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



Central Groundwater Treatment Plant Monthly Data Sheet

Report Number: 140 **Reporting Period: 28 February – 31 March 2011** **Date Submitted: 12 April 2011**

This monthly data sheet presents information regarding all systems and associated remedial process optimizations (RPOs) to the Central Groundwater Treatment Plant (CGWTP). The systems associated with the CGWTP include the CGWTP itself, the Thermal Oxidation System (ThOx), and the West Treatment and Transfer Plant (WTTP). The RPOs related to the CGWTP network of treatment systems include various emulsified vegetable oil (EVO) injection sites, two (2) bioreactors, and various rebound studies.

System Metrics

Table 1 presents operational data from the March 2011 reporting period:

Table 1 – Operations Summary – March 2011

Operating Time:		Percent Uptime:		Electrical Power Usage:	
CGWTP:	707 hours	**CGWTP:**	95.3%	**CGWTP:**	100 kWh (137 lbs CO_2 generated[a])
WTTP:	Water: 0 hours	**WTTP:**	Water: 0%	**WTTP:**	0 kWh
	Vapor: 0 hours		Vapor: 0%		

Gallons Treated: **1.2 million gallons**

Gallons Treated Since January 1996: **441 million gallons**

VOC Mass Removed:

4.23 lbs [b] **(groundwater only)**

0 lbs (vapor only)

VOC Mass Removed Since January 1996:

2,533 lbs from groundwater

8,686 lbs from vapor

Rolling 12-Month Cost per Pound of Mass Removed: $1,687 [c]

Monthly Cost per Pound of Mass Removed: $1,578

[a] Based on Department of Energy estimate that 1 kilowatt hour generated produces 1.37 pounds of GHG.

[b] Calculated using March 2011 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 WTTP.

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

Table 2 – CGWTP Average Flow Rates

Location	Average Flow Rate	
	Groundwater (gpm)	Soil Vapor (scfm) [b]
EW01x16	20.5	Off line
EW02x16	7.3	Off line
EW03x16	3.5[c]	Off line
EW605x16	Off line [d]	Off line
EW610x16	Off line [d]	Off line
CGWTP	27.5	--
WTTP	Off line	Off line

[a] Measured by the effluent discharge to the storm drain divided by the operating time during the month
[b] No vapor was treated in March 2011
[c] Water discharged to Site SS016 bioreactor – flow rate taken when pump is operating (is not an average).
[d] Off line due to motor fault.

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

Table 3 presents average flow rate values from the West Industrial Operable Unit (WIOU) extraction wells.

Table 3 – Average Flow Rate from the WIOU Extraction Wells[a] (gpm)

SD037/ SD043				SD033/SD034		SD036	
EW599x37	Off line	EW705x37	Off line	EW501x33	Off line	EW593x36	Off line
EW700x37	Off line	EW706x37	Off line	EW503x33	Off line	EW594x36	Off line
EW701x37	Off line	EW707x37	Off line	EW01x34	Off line	EW595x36	Off line
EW702x37	Off line	EW510x37	Off line	EW03x34	Off line		
EW703x37	Off line	EW511x37	Off line				
EW704x37	Off line	EW555x43	Off line				

[a] Extraction wells are offline due to the ongoing rebound study in the WIOU.

gpm—gallons per minute
NA – not available / not recorded

Table 4 presents average a summary of shutdowns during the monthly reporting period.

Table 4 – Summary of System Shutdowns

Location	Shutdown		Restart		Cause
	Date	Time	Date	Time	
CGWTP (Groundwater)					
CGWTP	19 March 2011	23:30	21 March 2011	09:15	Electrical power outage
WTTP					
WTTP (Vapor)	24 August 2009				System shutdown for rebound study
WTTP (Water)	27 April 2010				System shutdown for rebound study

CGWTP = Central Groundwater Treatment Plant

WTTP = West Transfer Treatment Plant

Summary of O&M Activities

Monthly groundwater samples at the CGWTP were collected on 7 March 2011. Sample results are presented in Table 5. The total VOC concentration (435 µg/L) in the influent sample has increased slightly since the February 2011 sample (392 µg/L) was collected.

Extraction wells EW605x16 and EW610x16 remained off line during March 2011. Both replacement pumps are available, and on 29 March 2011, extraction pump EW610x16 was replaced. Upon restarting the pump, inconsistent flow and pump operation were observed. Further troubleshooting indicated that the electrical power lines between the various pull boxes (between the main control panel and well vaults) and well vaults will likely need to be replaced. Troubleshooting will continue in April 2011.

Optimization Activities

The WTTP remained off line since being shut down in April 2010 for the ongoing rebound study.

No additional optimization activities occurred at the CGWTP in March 2011.

Table 5

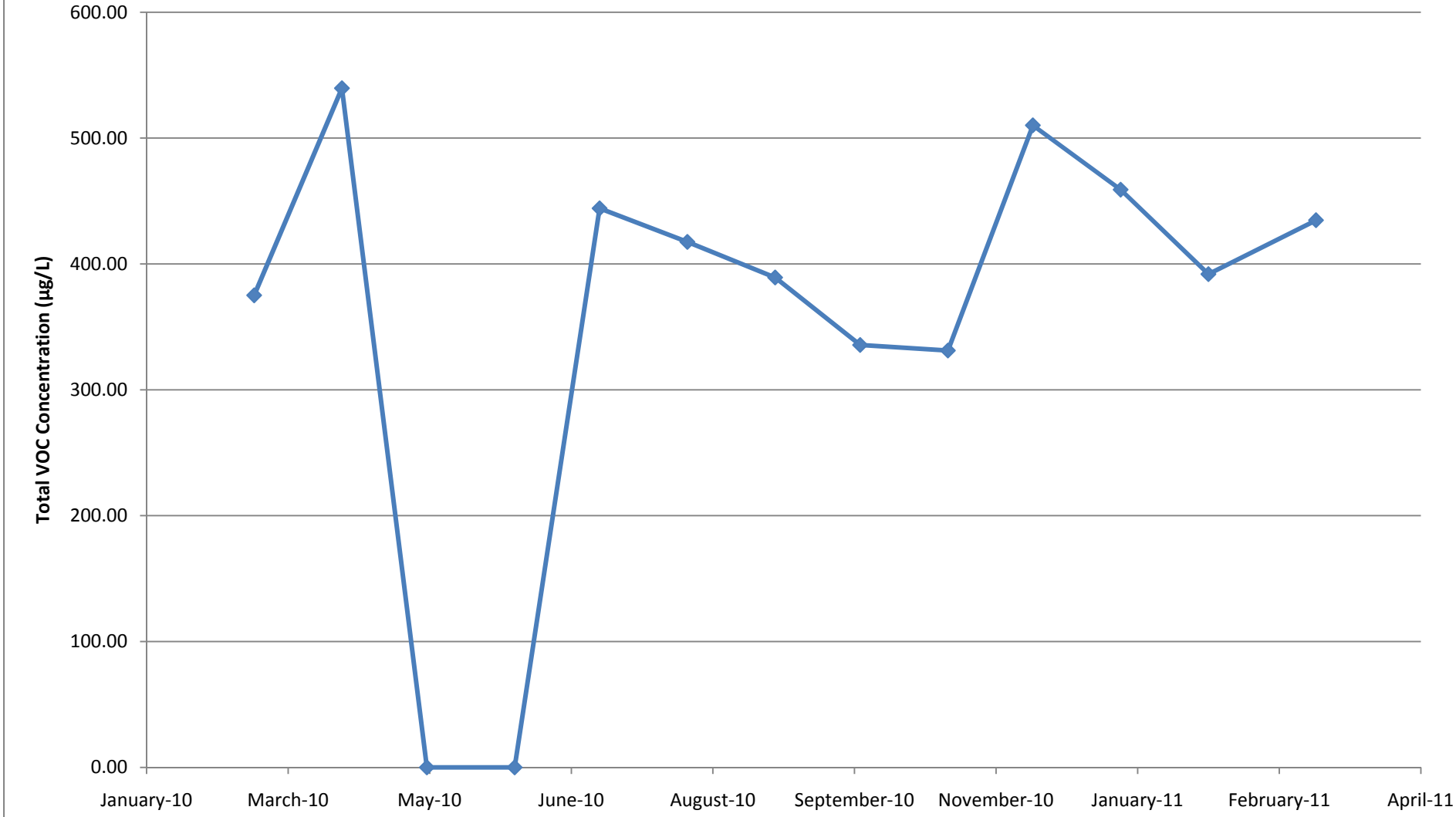
Summary of Groundwater Analytical Data for March 2011 – Central Groundwater Treatment Plant

Constituent	Instantaneous Maximum[a] (µg/L)	Detection Limit (µg/L)	N/C	7 March 2011 (µg/L) Influent	After Carbon 1 Effluent	After Carbon 2 Effluent	System Effluent
Halogenated Volatile Organics							
Bromodichloromethane	5.0	0.15	0	ND	ND	ND	ND
Carbon Disulfide	1.0	0.19	0	ND	ND	ND	ND
Carbon Tetrachloride	0.5	0.14	0	ND	ND	ND	ND
Chloroform	5.0	0.16	0	ND	ND	ND	ND
MTBE	1.0	0.5	0	ND	ND	ND	ND
1,2-Dichlorobenzene	5.0	0.08	0	0.28 J	ND	ND	ND
1.3-Dichlorobenzene	5.0	0.15	0	0.32 J	ND	ND	ND
1,4-Dichlorobenzene	5.0	0.15	0	0.19 J	ND	ND	ND
1,1-Dichloroethane	5.0	0.15	0	ND	ND	ND	ND
1,2-Dichloroethane	0.5	0.15	0	ND	ND	ND	ND
1,1-Dichloroethene	5.0	0.19	0	0.71	ND	ND	ND
cis-1,2-Dichloroethene	5.0	0.19	0	105	ND	ND	ND
trans-1,2-Dichloroethene	5.0	0.33	0	4.7	ND	ND	ND
Methylene Chloride	5.0	0.66	0	ND	ND	ND	ND
Tetrachloroethene	5.0	0.21	0	0.67	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	319	ND	ND	ND
Vinyl Chloride	0.5	0.18	0	0.75	0.65	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	0.5 – 0.23	0	ND	ND	ND	ND

[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
N/C = number of samples out of compliance with discharge limits
ND = not detected
µg/L = micrograms per liter

Figure 1
CGWTP Total VOC Influent Concentrations
Travis Air Force Base, California



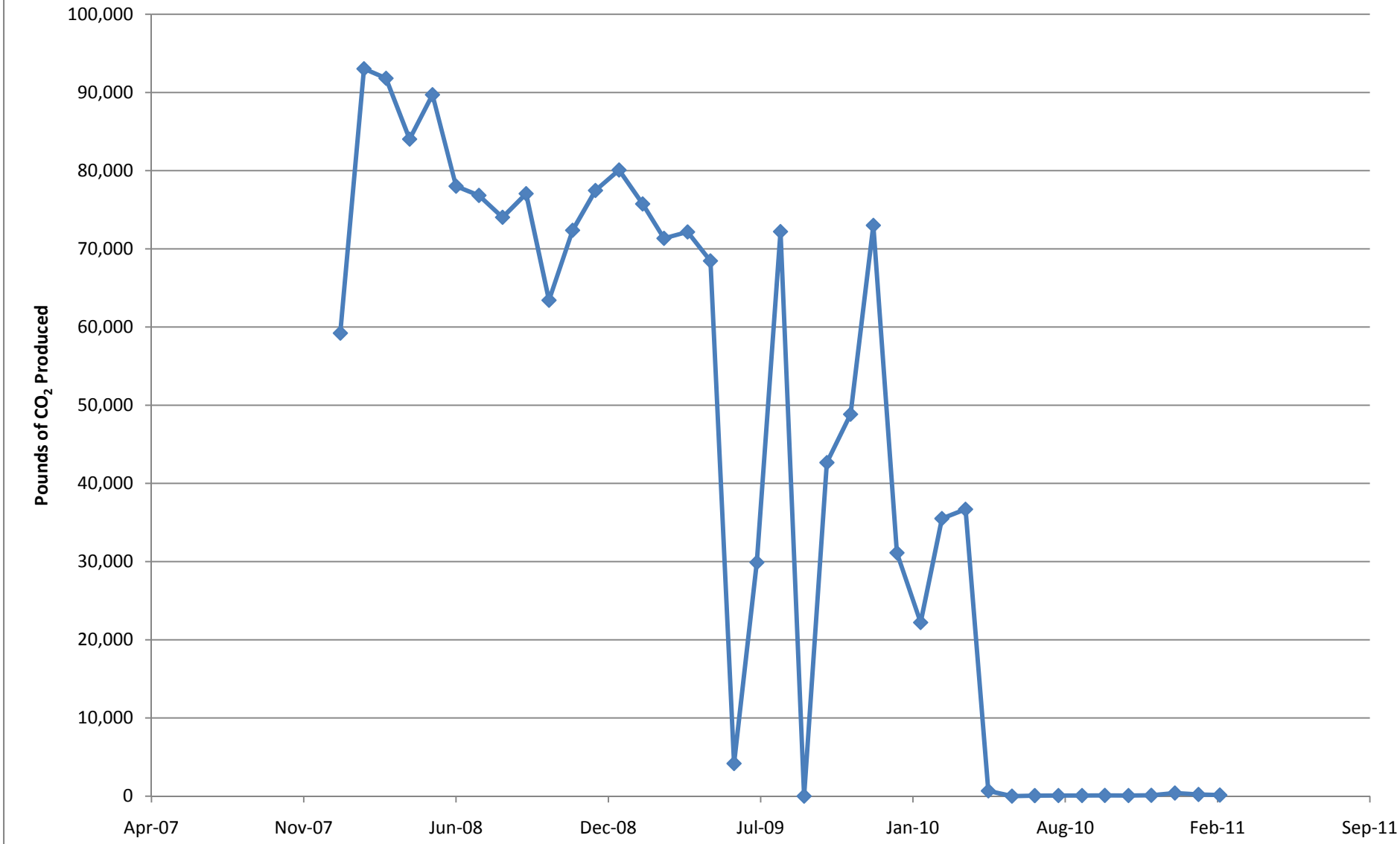
Sustainability

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. These include the WTTP and ThOx systems. The CGWTP produced approximately 137 pounds of GHG during March 2011. This is a decrease from February 2011, and is consistent with the overall decrease since the UV/Ox, ThOx, and WTTP were all taken off line.

Figure 2

Equivalent Pounds of CO2 Produced by the Central Groundwater Treatment Plant



Site ST018 Groundwater Treatment Plant Monthly Data Sheet

Report Number: 001 **Reporting Period: 28 February – 31 March 2011** **Date Submitted: 12 April 2011**

This monthly data sheet presents information regarding the Site ST018 Groundwater Treatment Plant (S18GWTP).

System Metrics

Table 1 presents operation data from the March 2011 reporting period. The S18GWTP was brought on line for the first time in March 2011.

Table 1 – Operations Summary – March 2011

Operating Time:	Percent Uptime:	Electrical Power Usage:
S18GWTP: 408 hours	**S18GWTP:** 100%	**S18GWTP:** 65 kWh (89 lbs CO_2 generated)

Gallons Treated: **82 thousand gallons**

Gallons Treated Since March 2011: **82 thousand gallons**

Volume Discharged to Storm Drain: **82 thousand gallons**

BTEX, MTBE, TPH Mass Removed: **2.22 lbs**

BTEX, MTBE, TPH Mass Removed Since March 2011: **2.2 lbs**

Rolling 12-Month Cost per Pound of Mass Removed: NA [a]

Monthly Cost per Pound of Mass Removed: NA[a]

Lbs = pounds

[b] Costs during startup will be accounted for in April 2011.

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[a]

Location	Average Flow Rate Groundwater (gpm)
EW2014x18	0.9
EW2016x18	0.3
EW2019x18	1.67
Site ST018 GWTP	3.33

[a] All flow rates calculated by dividing total gallons processed by system operating time for the month.

gpm = gallons per minute
S18GWTP = Site ST018 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	
S18GWTP	None				

S18GWTP = Site ST018 Groundwater Treatment Plant

Summary of O&M Activities

The S18GWTP was brought on line on 11 March 2011. This date was the first time the S18GWTP discharged its effluent process stream to the storm drain. Prior to that, the system began startup operations on 2 March, 2011, but all treated process water was contained within a 21,000 gallon holding tank. During this time, the system was sampled during the first and fifth day of operation as required by the Site ST018 National Pollutant Discharge Elimination System (NPDES) permit.

Following receipt of analytical results from these sampling events, the system was configured to discharge all treated process water to the storm drain, including all water previously stored on Site while collecting startup samples.

Particulate carbon (fines) present in fresh carbon can lead to pH rise as process water passes through each vessel. The carbon vessels were backflushed on 9 March 2011 in an effort to reduce the amount of pH rise occurring across the carbon vessels.

Table 4 below provides sample results from both sampling events during system startup activities.

Optimization Activities

No optimization activities occurred at the S18GWTP in March 2011.

Table 4

Summary of Groundwater Analytical Data for March 2011 – Site ST018 Groundwater Treatment Plant

Constituent	Instantaneous Maximum[a] (µg/L)	Average Monthly Maximum (µg/L)	N/C	2 March, 2011 (µg/L)			11 March, 2011 (µg/L)		
				Influent	After Carbon 2	System Effluent	Influent	After Carbon 2	System Effluent
Halogenated Volatile Organics									
Carbon Tetrachloride	5	4.4	0	ND < 0.4	ND < 0.4	ND < 0.4	NS	NS	NS
Chloroform	5	--	0	ND < 0.4	ND < 0.4	ND < 0.4	NS	NS	NS
1,1-Dichloroethane	5	--	0	ND < 0.4	ND < 0.4	ND < 0.4	NS	NS	NS
1,2-Dichloroethane	5	--	0	1.3 J	ND < 0.4	ND < 0.4	NS	NS	NS
1,1-Dichloroethene	5	3.2	0	ND < 0.6	ND < 0.6	ND < 0.6	NS	NS	NS
cis-1,2-Dichloroethene	5	--	0	ND < 0.6	ND < 0.6	ND < 0.6	NS	NS	NS
trans-1,2-Dichloroethene	5	--	0	ND < 0.6	ND < 0.6	ND < 0.6	NS	NS	NS
Methylene Chloride	5	--	0	ND < 0.6	ND < 0.6	ND < 0.6	NS	NS	NS
Tetrachloroethene	5	--	0	ND < 0.4	ND < 0.4	ND < 0.4	NS	NS	NS
1,1,1-Trichloroethane	5	--	0	ND < 0.5	ND < 0.5	ND < 0.5	NS	NS	NS
1,1,2-Trichloroethane	5	--	0	ND < 0.5	ND < 0.5	ND < 0.5	NS	NS	NS

Table 4

Summary of Groundwater Analytical Data for March 2011 – Site ST018 Groundwater Treatment Plant

Constituent	Instantaneous Maximum[a] (µg/L)	Average Monthly Maximum (µg/L)	N/C	2 March, 2011 (µg/L)			11 March, 2011 (µg/L)		
				Influent	After Carbon 2	System Effluent	Influent	After Carbon 2	System Effluent
Ethylene Dibromide	5	--	0	ND < 0.5	NS	ND < 0.5	NS	NS	NS
Trichloroethene	5	--	0	ND < 0.4	ND < 0.4	ND < 0.4	NS	NS	NS
Vinyl Chloride	1	--	0	ND < 0.5	ND < 0.5	ND < 0.5	NS	NS	NS
Fuel Related Constituents									
MTBE	5	--	0	220	ND < 0.4	ND < 0.4	77	NS	ND < 0.4
Benzene	5	--	0	120	ND < 0.4	ND < 0.4	13	NS	ND < 0.4
Ethylbenzene	5	--	0	130	ND < 0.4	ND < 0.4	45	NS	ND < 0.4
Toluene	5	--	0	22	ND < 0.4	ND < 0.4	4.5	NS	ND < 0.4
Total Xylenes	5	--	0	207	ND < 0.5	ND < 0.5	116	NS	ND < 0.5
Total Petroleum Hydrocarbons – Gasoline	50	--	0	2,000 Y	19 J	21 J	780	NS	11 J
Total Petroleum Hydrocarbons – Diesel	50	--	0	480 Y	23 J	45 J	140 Y	NS	13 J
Total Petroleum Hydrocarbons – Motor Oil	--	--	0	120 J	ND < 56	ND < 56	NS	NS	NS

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

J = analyte concentration is considered an estimated value

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

ND = not detected above method detection limit

Table 4

Summary of Groundwater Analytical Data for March 2011 – Site ST018 Groundwater Treatment Plant

Constituent	Instantaneous Maximum[a] (µg/L)	Average Monthly Maximum (µg/L)	N/C	2 March, 2011 (µg/L)			11 March, 2011 (µg/L)		
				Influent	After Carbon 2	System Effluent	Influent	After Carbon 2	System Effluent

NS = not sampled

Y = Sample exhibits chromatographic patterns which does not resemble standard

µg/L = micrograms per liter

Travis AFB
Restoration Program

Management Overview Briefing

RPM Meeting

April 21, 2011

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 WP
- ST027B Site Characterization WP
- 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 WP
- Phytostabilization Demonstration Tech Memo
- Model QAPP
- LF008 Rebound Test Tech 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
- Phytostabilization Study Report
- ***2009/2010 Annual GSAP Report***
- ***SS015 Remedy Optimization Field Implementation Plan***

2

Completed Field Work

- ST027B Gore Sorber Survey – Ph 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 – Ph 1
- ST027 Site Characterization -Ph 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
- DP039 Bioreactor Quarterly Performance Sampling
- SD037 EVO Quarterly Performance Sampling
- SS015 EVO Baseline Sampling
- SD036 EVO Baseline Sampling
- SS016 Bioreactor Startup
- SD036 Injection Well Installation (8)
- SS015 Injection Well Installation (5)
- ST018 GETS Installation
- SD036 EVO Injection
- Semiannual GSAP
- SS015 EVO Injection
- Quarterly RPO Performance Monitoring (Feb 2011)
- ***ST018 GETS Startup***

3

In-Progress Documents & Field Work

<u>Documents</u>

- Comprehensive Site Evaluation Phase II Report
- ISCO/ERD Tech Memo
- Focused Feasibility Study (FFS)
- SD036 Remedy Optimization Field Implementation Plan
- 2010 Annual CAMU Inspection Report
- Sites SS014 and ST032 Tier 1 POCO Evaluation Report

<u>Field Work</u>

- None

4

Upcoming Documents

- Site ST018 POCO Baseline Implementation Report — May
- 2010 Groundwater RPO Annual Report — May
- Baseline Implementation Report (Sites SS015, SS016, SD036, SD037, and DP039) — May
- FT005 Data Gaps Investigation Report — May
- Proposed Plan — Jun
- Technical and Economic Feasibility Analysis (TEFA) — Jul

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Upcoming Field Work

- 2011 Annual GSAP Sampling — Apr
- Quarterly RPO Performance Monitoring — May
  - SS016 Bioreactor Initial Quarterly Performance Sampling
  - SD036 EVO Second Quarterly Performance Sampling
  - SD037 EVO Third Quarterly Performance Sampling
  - DP039 Biobarrier Third Quarterly Performance Sampling
  - DP039 Bioreactor Ongoing Semiannual Performance Sampling
- LF007C Site Characterization (Wetlands) — Jun*

* Estimated schedule – dependent on USFWS approval to sample in the vernal pool footprint

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Travis AFB
Field Schedule - 2011

RPM Meeting

April 21, 2011

2011 Field Schedule

• ST018 GETS Startup	Mar
• 2011 Annual GSAP Sampling	Apr - Jun
• Quarterly RPO Performance Monitoring (sites SS015 EVO injection, SS016 bioreactor, SD036 EVO injection, SD037 EVO injection, DP039 bioreactor, & DP039 EVO biobarrier)	May
• LF007C Remedy Optimization Investigation	Jun
• Quarterly RPO Performance Monitoring (sites SS016 bioreactor, SD036 EVO injection, SD037 EVO injection, & DP039 EVO biobarrier)	Aug
• FT005 Soil Remedial Action	June
• Quarterly RPO Performance Monitoring (sites SS015 EVO injection, SS016 bioreactor, SD036 EVO injection, SD037 EVO injection, DP039 bioreactor, & DP039 EVO biobarrier)	Nov
• 2011 Semiannual GSAP Sampling	Nov - Dec

2010 Annual Remedial Process Optimization Report

Central Groundwater Treatment Plant
North Groundwater Treatment Plant
South Base Boundary Groundwater Treatment Plant

RPM Meeting
April 21, 2011

Report Contents

Section	Title	Scope
1	Introduction	Scope of document and related reports
2	Groundwater Extraction & Treatment Plants	Process descriptions and treatment plant metrics
3	Field Measurements & Observations, & Compliance with Discharge	Comprehensive evaluation of data quality and compliance with discharge limitations
4	Remediation Sustainability	Discussion and evaluation of sustainability efforts for treatment plants and associated extraction systems
5	Bioreactors	Description, evaluation, & optimization actions
6	Emulsified Vegetable Oil Injections	Description, baseline conditions, & performance monitoring
7	Rebound Studies	Data presentation and performance evaluation
8	Actions for System Optimization	Optimization activities planned for 2011

2.1 - Central Groundwater Treatment Plant

- Six groundwater extraction wells from Tower Removal area (TARA), and Oil Spill Area (OSA)
- West Treatment and Transfer Plant (WTTP) collects extracted groundwater from up to 24 wells and transfers it to the CGWTP for treatment
- Includes the WIOU sites, Site DP039, and Site LF008
- 15 of the GWE wells are dual-phase (for vapor extraction), which is treated at the WTTP using two 2,000-lb VGAC vessels
- The CGWTP uses two 20,000-lb LGAC vessels for water treatment
- The UV/Ox system was shut down because it was no longer needed

CGWTP Summary of Optimization Activities

Activity	Status	Comments
WTTP taken offline	Completed in April 2010	Shut down because of fire station construction; kept offline for rebound study
ThOx system taken offline	Completed in April 2010	Taken offline to facilitate Site SS016 bioreactor construction and installation
Site DP039 EVO injection	Initiated in June 2010; completed in July 2010	EVO injection into thirteen (13) injection wells in a biobarrier formation
Site SS016 OSA Bioreactor installation	Initiated in September 2010;completed in October 2010	Well EW003x16 to be transferred as groundwater source for bioreactor
Site SD037 EVO injection	Initiated and completed in July 2010	EVO injection into seven (7) injection wells at Site SD037 hot spot
Site SS015 EVO injection	Initiated in December 2010	Begin EVO injection activities in three (3) injection wells
Site SD036 EVO injection	Initiated and completed in December 2010	EVO injection into eight (8) injection wells at Site SD036 hot spot
Extraction well EW003x16 transferred to groundwater source for Site SS016 bioreactor	Completed in October 2010	Pump replaced with solar powered pump, solar array of three (3) solar panels

2.2 - North Groundwater Treatment Plant

- Three extraction wells from Site SD031, eight extraction wells from Site FT004, and two extraction wells from Site LF007C
- Two of the extraction wells from Site SD031, and three of the extraction wells from Site FT004 are dual-phase extraction (water & vapor)
- The SVE system at sites FT004 and SD031 was shut down permanently in December 2007
- The original treatment system consisted of an air stripper and VGAC for vapor treatment – both of which have been shut down because no longer needed
- The current treatment includes three LGAC drums in series to treat extracted water from LF007C

NGWTP Summary of Optimization Activities

- The small LGAC treatment system was placed into service in July 2010

2.3 - South Base Boundary Groundwater Treatment Plant

- Fifteen groundwater extraction wells from Site FT005, seven from Site SS029, and seven from Site SS030
- Currently, as a result of optimization actions, three wells from Site FT005 are operational, six wells from Site SS029 are operational, and all seven wells from Site SS030 are operational.
- The original treatment system included a large tray-type air stripper
- The air stripper was replaced with two 6,000-lb LGAC vessels for water treatment

SBBGWTP Summary of Optimization Activities

Activity	Status	Comments
Well EW03x30 brought back online	Completed February 2010	Increase hydraulic capture of the Site SS030 TCE plume
SBBGWTP tested for operation in GAC mode only	Conducted June 2010	Decrease amount of electrical consumption at SBBGWTP
Well EW02x05 brought back online	Completed July 2010	Address 1,2-DCA rebound
Well EW734x05 brought back online	Completed August 2010	Address 1,2-DCA rebound
SBBGWTP modified for GAC only treatment	Completed August 2010	Carbon replaced, air stripper bypassed
Well EW735x05 brought back online	Completed October 2010	Address 1,2-DCA rebound

2 - Treatment Plant Metrics

	Central Plant	North Plant	South Plant
Volume of Water Treated	15.7 Million Gallons	0.05 Million Gallons*	47.9 Million Gallons
Average Flow Rate	38.3 gpm	0.30 gpm	101.5 gpm
Mass of VOCs Removed in 2010	72.3 lbs**	0.003 lbs	16.8 lbs
Influent VOC Concentrations	323 – 540 µg/L	5.6 – 7.1 µg/L	33.5 – 51.1 µg/L
Cost per lb of VOCs Removed	$1,399/lb	NA	$4,838/lb
Average Uptime	88%	90%***	90.6%

* Actual is 55,540
** Includes 18.8 lbs from soil vapor
*** When operating-doesn't include time when system was down for long periods due to vernal pools

3 – Summary of Data Quality Objectives and Discharge Compliance

For all three treatment plants:

- During 2010, there were no violations of the discharge limits
- Overall, the precision and accuracy of the data, as measured by field and laboratory QC indicators, suggest that the QAPP goals were met.

4 – Sustainability Milestones

	Central Plant	North Plant	South Plant
Accomplishments to increase remediation sustainability	• Decommissioned the Thermal Oxidation (Th/Ox) system	• System is mostly solar-powered and only one transfer pump is a plug-in	• Decommissioned the air stripper and replaced with LGAC

5 - Bioreactors

- Two bioreactors: DP039 and SS016
- Section 5 of the report includes a discussion of (for each bioreactor):
  - Design (and installation for SS016 system)
  - Monitoring well network
  - System operational parameters
  - Performance sampling results
  - Performance evaluation (baseline sampling results only, for the SS016 system)
  - Actions for bioreactor optimization (DP039 system only)

5 – Bioreactors (cont'd)

- Actions for Site DP039 Bioreactor Optimization:
  - Performance monitoring indicated need for regular recharging of soluble organic substrate, and will add food-grade vegetable oil annually
  - Transition to a more routine monitoring schedule (includes annual and semiannual sampling)
  - Performance monitoring will be reported in the annual GSAP report, along with the annual RPO report. Monitoring data will be reported in the Monthly Data Sheets
- Optimization of the Site SS016 bioreactor will be evaluated as additional performance monitoring is conducted

6 – EVO Injection Sites

- EVO injections conducted at four sites to optimize existing interim remedial actions: Sites DP039, SD036, SD037, and SS015
- Section 6 of the report includes a discussion of (for each EVO injection site):
  - EVO Injection design
  - Monitoring and injection wells
  - Performance sampling results (includes baseline sampling only for SS016)
  - Performance evaluation

EVO Performance Evaluation

EVO Injection Site	Performance Evaluation
DP039 Biobarrier	• Evaluation is limited to only one performance sampling event • Significant TCE reductions in injection wells (IW's) • Increase in ethene & ethane in IW's indicate reductive dechlorination is occuring along the biobarrier • Significant increases in methane, TOC, dissolved iron & manganese in IW's indicates reducing environment is developing along the biobarrier • Significant decrease in sulfate in IW's further indicates reducing environment is developing along the biobarrier
SD036	• Baseline sampling has been conducted – first performance monitoring scheduled for May 2011
SD037	• Evaluation is limited to only one performance sampling event • Significant TCE and cis-1,2-DCE reductions in IW's • Increase in ethene & ethane in IW's indicate reductive dechlorination is occuring • Significant increase in methane, TOC, dissolved iron & manganese in IW's indicates reducing environment is developing • Significant decrease in sulfate in IW's further indicates reducing environment is developing
SS015	Baseline sampling has been conducted – first performance monitoring scheduled for May 2011

7 – Rebound Studies

- Several rebound studies have been initiated as part of continuing optimization efforts
- Implemented when contaminant concentrations have dropped to asymptotic low levels and/or when existing methods lose their effectiveness
- Rebound studies initiated in the WIOU (groundwater and soil gas), and at sites LF008, FT004, SD031, and FT005

Rebound in WIOU

- The soil vapor extraction system rebound study started in August 2009
  - Of eight vapor extraction wells, four showed a decrease in total VOCs, and four showed an increase
  - Considering a restart of the four SVE wells showing an increase in total VOCs
- The groundwater rebound study started in April 2010
  - Wells sampled in 2nd quarter 2010 and in 4th quarter 2010
  - Ten of the 16 extraction wells show a decrease in TCE, and six show an increase
  - The rebound testing will continue through the interim period

Rebound at Site LF008

- Rebound study started in December 2008
- Pesticides plume (very low concentrations) has been unchanged despite 9 years of pumping
- Rebound test initiated to monitor plume change without pumping
- No rebound of pesticide concentrations observed to date
- The rebound testing will continue through the interim period

Rebound at Sites FT004 and SD031

- Rebound study initiated in December 2007
- Study initiated due to low, asymptotic contaminant concentrations in the wells and in the treatment plant influent
- Vinyl Chloride shows rebound in three extraction wells in FT004
- Overall, VOC concentrations (particularly TCE) are stable or declining
- The rebound testing will continue through the interim period

Rebound at Site FT005

- Rebound study started in December 2007
- Study initiated when all wells showed 1,2-DCA concentrations below the IRG
- Observed rebound to above IRGs in three extraction wells in 2010
- Returned those three extraction wells to service in August 2010
- The remaining portion of the rebound study will continue through the interim period

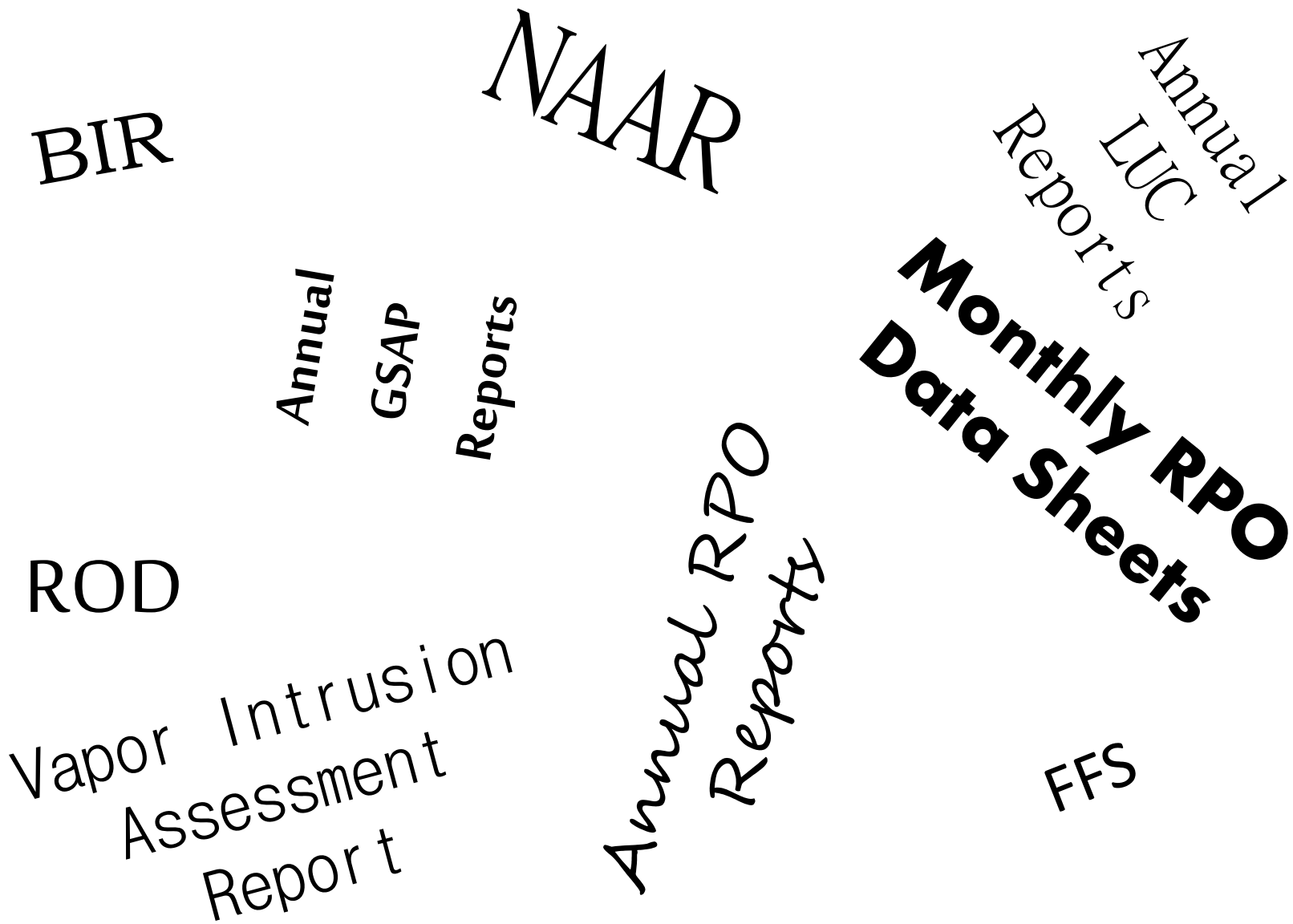
8 - Actions for System Optimization in 2011

- Continue the WIOU groundwater rebound study
- After sampling the WIOU vapor extraction wells in 2Q 2011, consider restarting those wells that show significant rebound
- Continue the rebound study at Site LF008
- Continue the rebound study at sites FT004 and SD031
- Conduct the planned site characterization at Site LF007C
- Continue the limited rebound study at Site FT005
- Monitor TCE plume mobility at Site SS030, for possible upgrade of extraction system

Clarifying the Document Maze

RPM Meeting

April 21, 2011


BIR
NAAR
Annual LUC Reports
Monthly RPO Data Sheets
Annual GSAP Reports
ROD
Vapor Intrusion Assessment Report
Annual RPO Reports
FFS

What is the Goal?

1. Selection of Final Remedies
2. Final Remedies in Place
3. Cleanup of the Sites

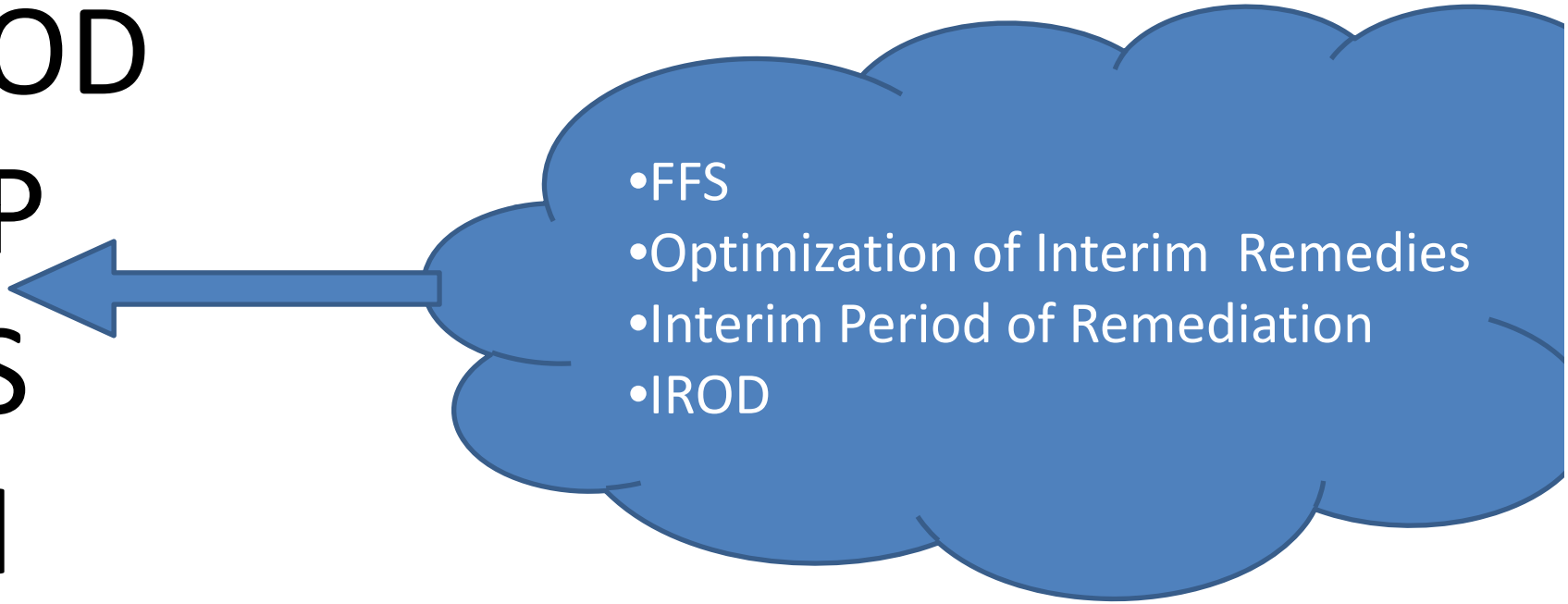
CERCLA Process?

ROD

PP

FS

RI



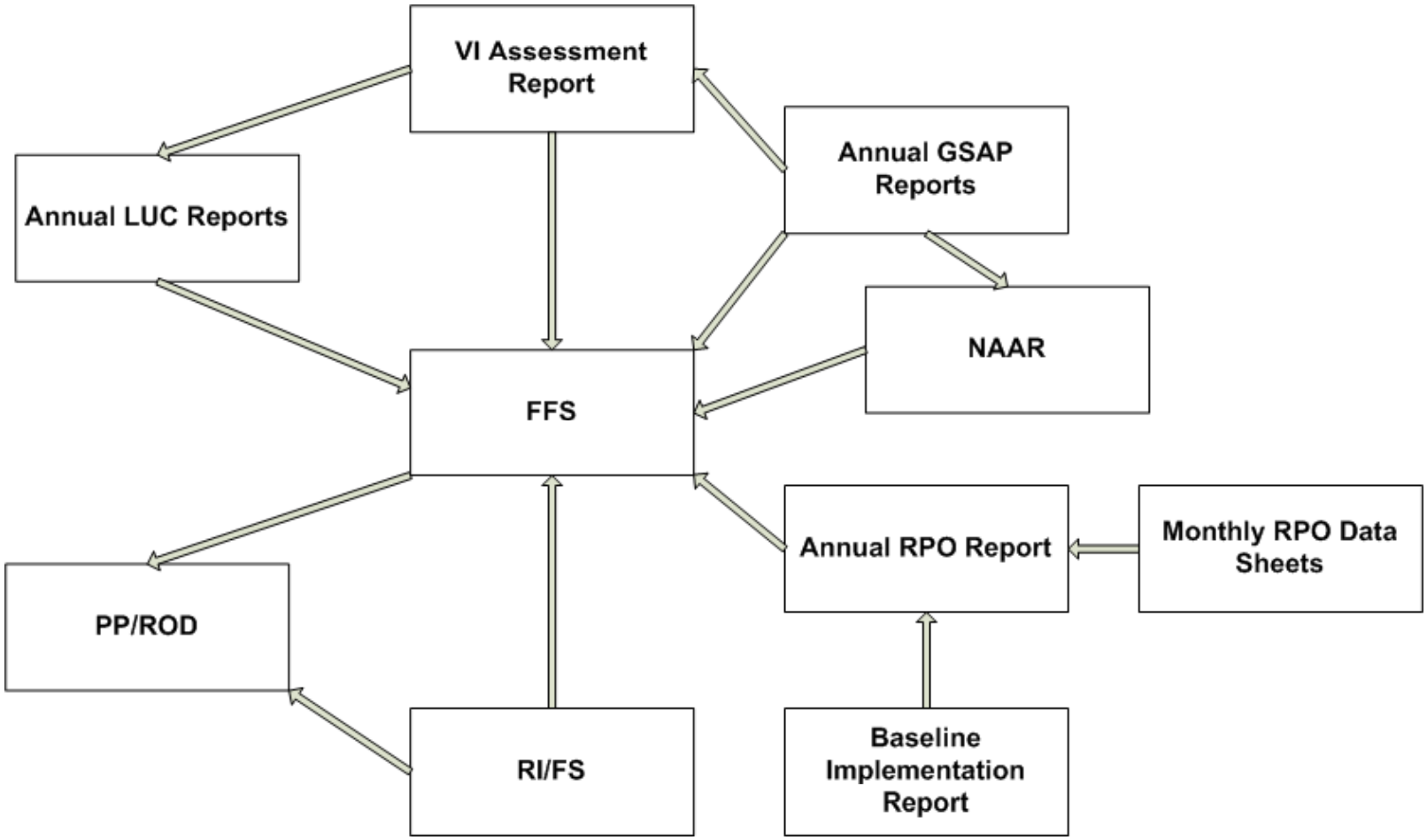
Transition from Interim to Final Remedies

- Evaluation of interim remedies
  - Two 5-Year Reviews
- Data gaps investigations
- Optimization of existing remedial systems
- Optimization of interim remedies

Transition Period Documents

- Monthly RPO Data Sheets
- Annual RPO Reports
- Annual GSAP Reports
- Baseline Implementation Report
- Natural Attenuation Assessment Report
- Vapor Intrusion Assessment Report
- Annual Land Use Control Reports
- Focused Feasibility Study

Report Relationships

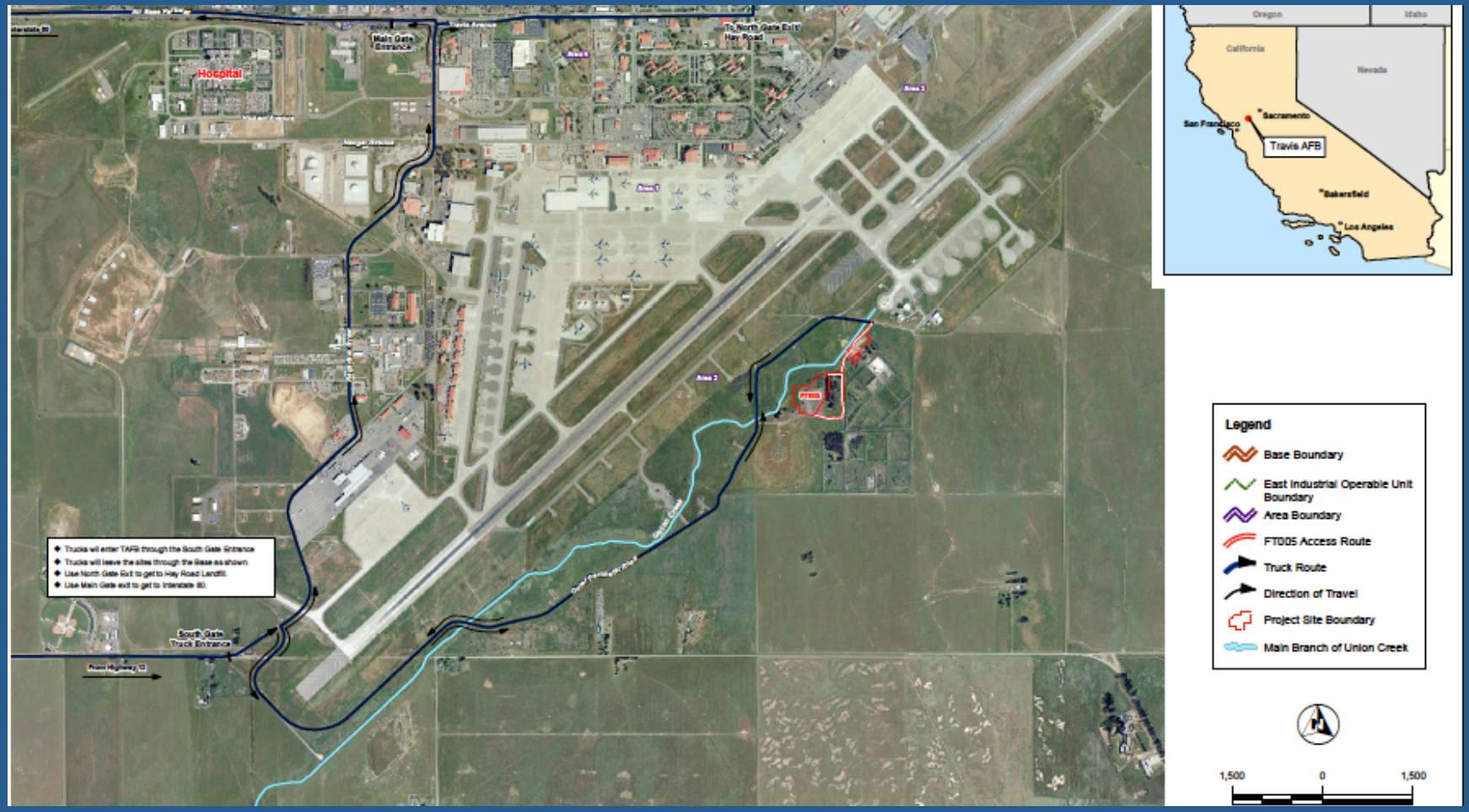


FT005 Soil Remedial Action Status

Background of FT005

- FT005 covers approximately 30 acres in the southeastern portion of what is now the North, East, and West Industrial Operable Unit (NEWIOU).
- The site includes the former Fire Training Area 4 (FTA-4), used for fire training exercises from 1962-1987.
- From 1962 until the early 1970s, waste fuels, oils, and solvents were burned at the site during training exercises. From the early 1970s until 1987, only waste fuels were burned at the site.

Location of Site FT005



Background of FT005

- From 1990 to 1994, the northern portion of the area was used as a dump site for miscellaneous waste, such as concrete and fencing.
- The 1995 Remedial Investigation identified PAHs, PCBs, dioxins, metals, VOCs and TPH as potential COCs at FT005.
- A 2004 Human Health Tech Memo concluded that only cleanup of soils containing PAHs were necessary for the protection of human receptors at FT005.

2006 NEWIOU ROD

- The 2006 NEWIOU ROD selected excavation of soil with concentrations of PAHs that pose a potential human health risk as the soil remedy for FT005.
- The specified PAHs are:

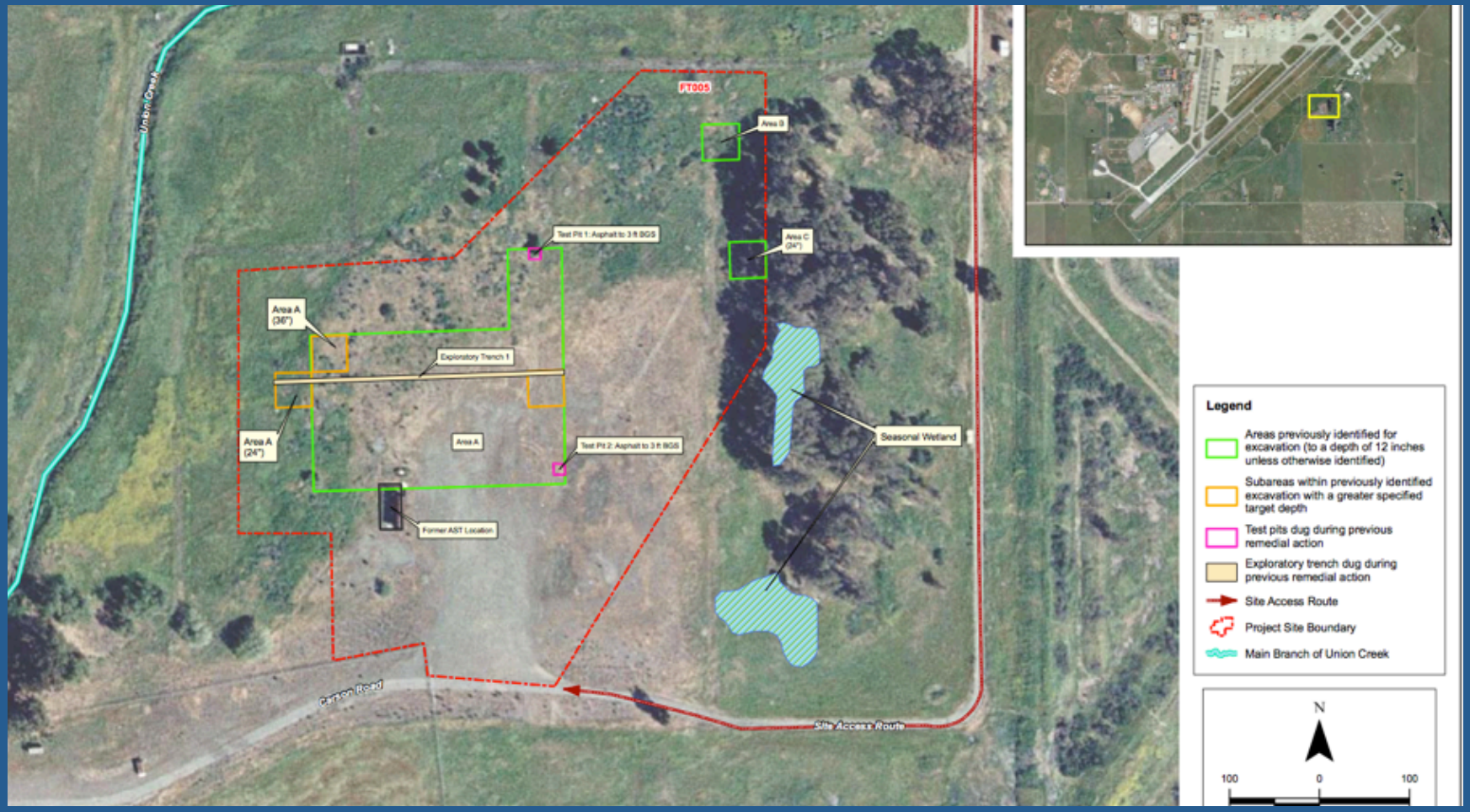
  - benzo(a)anthracene
  - benzo(a)pyrene
  - benzo(b)fluoranthene
  - benzo(k)fluoranthene
  - dibenz(a,h)anthracene
  - indeno(1,2,3-c,d)pyrene

- Land Use Controls (LUCs) were identified for PCBs, dioxins, or TPH concentrations exceeding levels that allow for unrestricted use.
- No action was deemed necessary for VOCs or metals (except for selenium which was collocated within the ROD designated excavation limits).
- In 2007, a Soil Remedial Design and a RAWP for FT005 were issued to support implementation of the remedy.

Initial FT005 RA

- In September 2007, remedial actions were initiated.
- During the initial excavation activities at the site, petroleum hydrocarbon-saturated soil and miscellaneous debris were encountered within Area A, which significantly increased the level of effort needed to complete the RA. RA activities were postponed until 2011.

2007 RA Activities



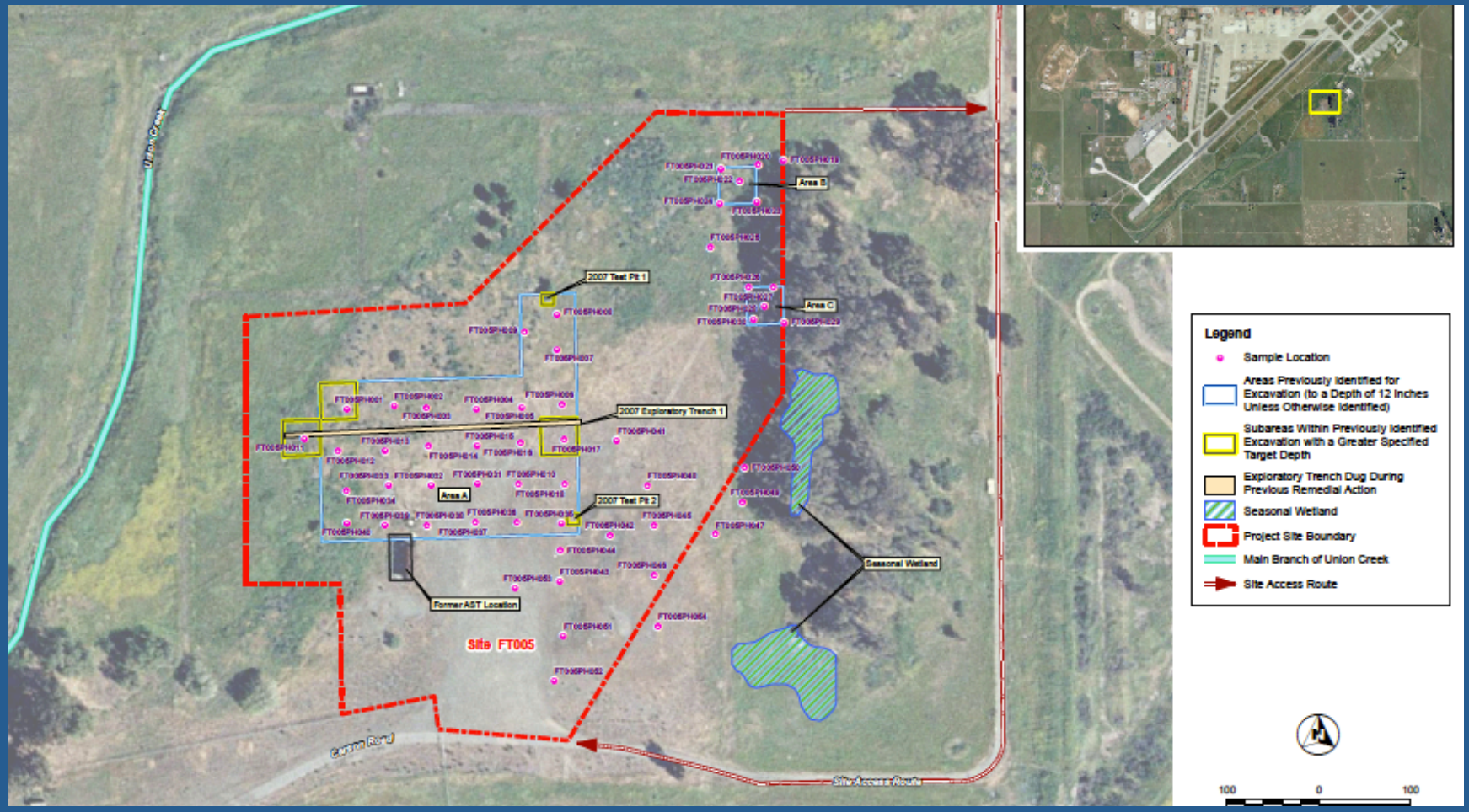
Data Gap Investigation

- Based on the findings of the initial RA, a Data Gap Investigation was planned to:
  - Delineate the extent of asphalt/concrete debris exposed by the 2007 grass fire and the extent of petroleum hydrocarbon-saturated soils and miscellaneous debris identified in the 2007 RA.
  - Refine the volume of soil requiring excavation to meet the standards established in the NEWIOU ROD.
  - Calculate the additional volume of soil potentially requiring excavation to meet residential (unrestricted) cleanup levels.

Data Gap Investigation

- The data gap investigation was conducted in May-June 2010.
  - Biological monitoring was performed during the potholing to protect potential California Tiger Salamanders (none were observed).
  - Pothole locations were established using a 50-foot grid in Areas A, B, and C; and a 100-foot grid for the remainder of the target area.
  - The site was then surveyed and cleared for underground utilities.

Data Gap Investigation



Data Gap Investigation

- 54 pothole locations were excavated down to 6 feet bgs with 8 of the locations excavated down to 18 feet bgs based on PID readings.
- Samples were collected from within each pothole at depths of 1.5-2 feet, 3.5-4 feet, and 5.5-6 feet, with additional samples from 8 to 14 feet bgs for the deeper potholes.
- Samples were analyzed for the following:
  - 100% of the samples for PAHs and TPHd/TPHmo
  - 50% of the samples for PCBs
  - 10% of the samples for VOCs, dioxins and metals

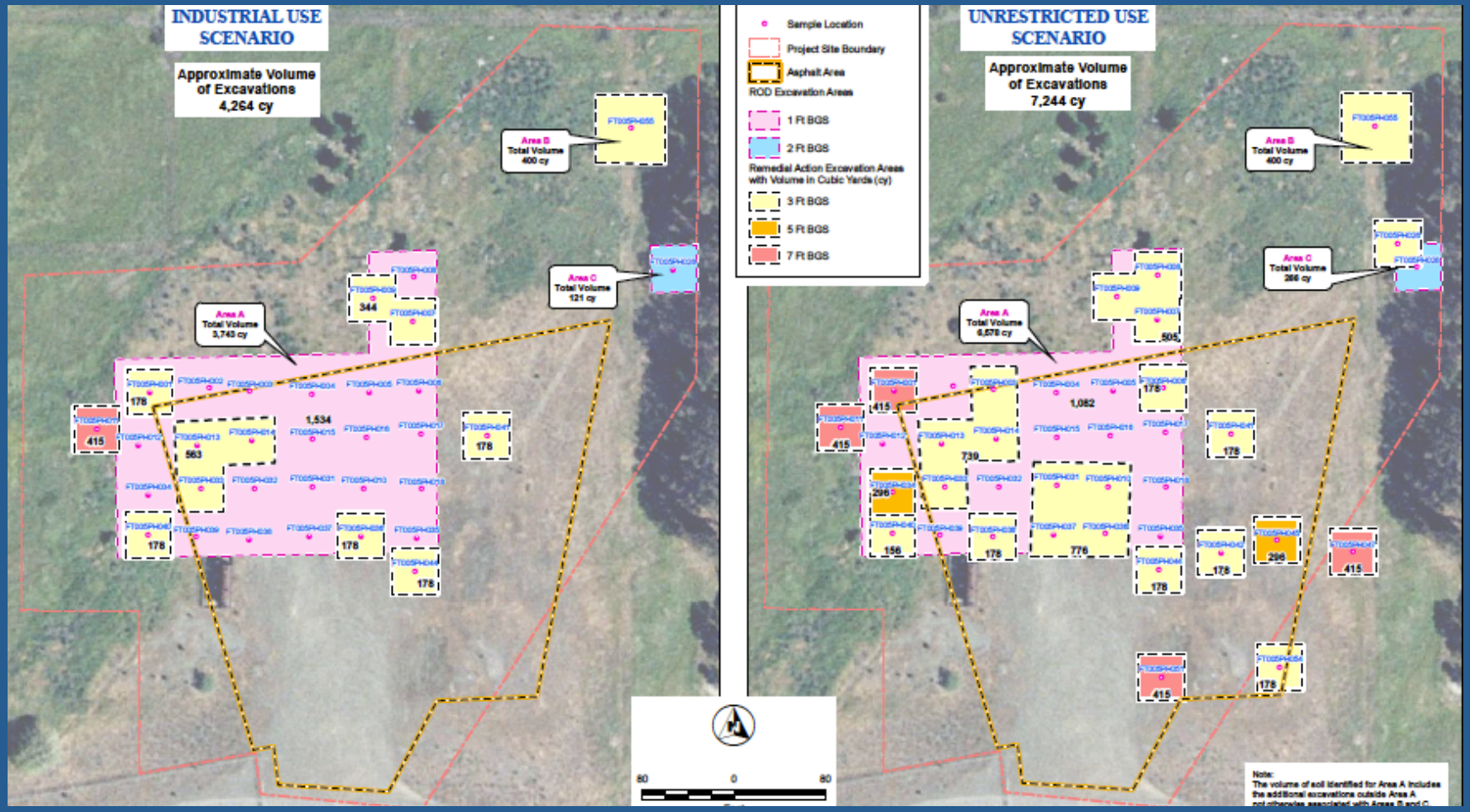
Results of Data Gap Sampling

- Observed debris consisted primarily of concrete rubble, chunks of asphalt, wood, scrap metal, and miscellaneous trash.
- A 6-inch asphalt layer extended over a majority of Area A and to the east and south. Loose asphaltic debris (degraded asphalt mixed with soil) was observed to an average depth of two feet.
- No saturated soil or free product was observed, with the exception of a single 5-gallon drum of oil at FT005PH048.
- TPH concentrations from six potholes located in the southern and southeastern portion of Area exceeded the NEWIOU ROD level of 2,300 mg/kg for unrestricted use.

Results of Data Gap Sampling

- PAHs exceeded NEWIOU ROD industrial and residential cleanup levels at 11 and 23 locations, respectively.
- Three dioxin detections from 2 feet bgs exceeded its 2004 PRG, as referenced in the NEWIOU ROD, used to determine the need for LUCs.
- The dioxin detections were collocated with PAHs that had exceeded their residential cleanup levels.
- Arsenic and iron exceeded their respective Travis AFB Inorganic Background Concentrations in one sample.
- There were no VOCs detected and no PCBs results were reported above levels identified in the NEWIOU ROD requiring LUCs.

Remedial Action



FT005 Cleanup Levels

- Cleanup Levels for PAHs, dioxin and TPH are based on the NEWIOU ROD cleanup levels.

Chemical	ROD Industrial Cleanup Level (mg/kg)	Unrestricted Use (mg/kg)
Benzo(a)anthracene	2.1	0.62
Benzo(a)pyrene	0.21	0.062
Benzo(b)fluoranthene	2.1	0.62
Benzo(k)fluoranthene	21	6.2
Dibenzo(a,h)anthracene	0.21	0.062
Indeno(1,2,3-c,d)pyrene	2.1	0.62
PCB	NA	0.22
2,3,7,8-Tetrachlorodibenzo-p-dioxin	NA	0.0000039
Total Petroleum Hydrocarbons	NA	2,300

Remedial Action

- An Addendum to the 2007 FT005 Final RAWP has been prepared to support excavation of the additional soil volume identified by the data gap investigation.
- Excavate soils within Areas A, B and C.
- Excavate the additional soils identified to remove need for LUCs.
- Segregate concrete and asphalt rubble/debris for possible recycling or on-site Base reuse.