



TETRA TECH

PITT-03-9-052

March 20, 2009

Project Number 112G00182

Mr. Curt Frye
BRAC Program Management Office Northeast
4911 South Broad Street
Philadelphia, Pennsylvania 19112-1303

Reference: CLEAN Contract No. N62472-03-D-0057
Contract Task Order 041

Subject: Restoration Advisory Board (RAB) Meeting Minutes of February 11, 2009
Former Naval Air Warfare Center (NAWC) Warminster, Pennsylvania

Dear Mr. Frye:

Enclosed please find the minutes from the RAB meeting held on February 11, 2009. Copies of the minutes are being sent to the individuals identified on the distribution list.

Please contact me if you have any questions or comments.

Sincerely,

Jeffrey P. Orient
Project Manager

JPO/stc

Enclosure

c: Ron Sloto (USGS)
Charles Clark (PADEP)
Tom Buterbaugh (PADEP)
Toby Kessler (Gilmore & Associates)
Dave Fennimore (Earth Data)
Garth Glenn (TiNUS)
Pat Schauble (ECOR)
David Streetsmith (ECOR)
Kathy Davies (U.S. EPA)
Norm Kelly (RAB Co-Chair)
Dennis Orenshaw (U.S. EPA)
Bob Lewandowski (Navy BRAC PMO)
Chris Candela (ATC Associates)
File 112G00182

Tetra Tech NUS, Inc.

661 Andersen Drive, Pittsburgh, PA 15220-2745
Tel 412.921.7090 Fax 412.921.4040 www.ttnus.com

**FORMER NAVAL AIR WARFARE CENTER (NAWC) WARMINSTER
MEETING MINUTES**

**RESTORATION ADVISORY BOARD (RAB) MEETING NO. 113
REFERENCE: CLEAN CTO NO. 041**

1. Meeting Date and Time: February 11, 2009, 9:40 AM to 11:00 AM
2. Location: Warminster Municipal Authority Board Room
3. Attendees: See Attachment 1 (attendance list)
4. Summary of Meeting Discussions: See below.

Administrative Update

Mr. Curt Frye, the Navy's Remedial Project Manager (RPM) for the project working out of the Navy's Base Realignment and Closure Program Management Office (BRAC PMO) in Philadelphia, opened the meeting by welcoming the attendees and providing an agenda for the meeting (Attachment 2).

Comments were solicited on the November 12, 2008 RAB meeting minutes. No comments were offered by those in attendance and the meeting minutes were approved as-is.

Action items from the November 12, 2008 RAB meeting were reviewed. The action items from the November 2008 meeting are summarized below:

- 1. PADEP is to send out copies of the CRC RI Report, along with PADEP's comments.**

Mr. Tom Buterbaugh (PADEP hydrogeologist) sent the RI Report out and provided an electronic copy of the December 18 comment letter to the Navy. Mr. Frye will resend a copy of the letter to the RAB.

- 2. PADEP is to set up a conference call or meeting to discuss CRC issues.**

No meeting has been set up to date. Mr. Buterbaugh indicated that PADEP plans to meet with CRC on March 4 to discuss project issues, after which a meeting among the RAB participants may be set up.

3. ECOR is to send out an email documenting the decisions reached at the RAB meeting regarding the new extraction well in Area A.

Mr. David Streetsmith (ECOR; Navy contractor) sent an email with the information a few days after the November RAB meeting.

4. EPA is to check the OU-1A ROD language regarding control of offsite drilling activities.

Mr. Dennis Orenshaw (EPA remedial project manager) indicated that there is language in the ROD about using township ordinances to control drilling in the area. Both Warminster and Ivyland have ordinances in place. No additional Navy action is required. Mr. Buterbaugh stated that he has told CRC's consultant to get permits for any future drilling. Mr. Frye asked about whose responsibility it is to follow up regarding conformance with permit requirements. Mr. Buterbaugh indicated that it is up to the local authorities, who can fine anyone who violates the ordinance.

5. Earth Data is to provide the recent WMA Well 26 sampling data to ECOR.

Mr. Dave Fennimore (Earth Data; Warminster Municipal Authority consultant) indicated that he has provided the sampling data to ECOR.

6. ECOR is to send out the Area C and Area D sampling data tables.

Mr. Pat Schauble (ECOR) indicated that the data has not been sent out yet but will be included with the upcoming semiannual monitoring report. Mr. Jeff Orient (Tetra Tech NUS; Navy contractor) requested that Excel spreadsheet tables be provided so that the data can be manipulated if desired.

Off-Site Investigations

Mr. Buterbaugh provided an update of the status of the CRC investigation. As mentioned during the action item review, CRC has requested a meeting, which is scheduled for March 4. The

regulatory program that the site falls under has been the subject of some discussion between CRC and PADEP – CRC wants to stay within the Act 2 program, however there was also some potential overlap with the storage tank program which has a more defined schedule for work activities and deliverables. After some discussion with the PADEP storage tank program staff, it was determined that the CRC site should not be in the storage tank program since the tanks have been tested and were not leaking. Mr. Buterbaugh stated that he plans to push for a schedule for future activities/submittals or for a consent agreement if CRC is unreceptive to agreeing to a schedule.

Mr. Frye asked whether CRC is aware of the issues regarding impacts to Warminster Municipal Authority Well 26 (WMA 26). Mr. Buterbaugh indicated that CRC is aware, and he suggested that the Navy contact CRC regarding cost sharing for remedial activities. Mr. Bob Lewandowski (BRAC PMO) stated that there have been internal discussions with Navy legal staff. Mr. Frye indicated that the Department of Justice (DOJ) is engaged and will be following up on the issue. Mr. Charles Clark (PADEP project manager) asked whether CRC is aware that they will likely be asked for cost sharing – Mr. Buterbaugh indicated that CRC is aware of this possibility.

Mr. Frye asked that PADEP make it clear to CRC that all of the pertinent Navy data is available to them and that the Navy is willing to let CRC use Navy wells in the area if needed in future site investigation work. Mr. Fennimore questioned why CRC would need access to the wells – Mr. Buterbaugh and Mr. Clark indicated that they may want to collect additional water level or sampling data. Mr. Fennimore expressed the concern that the investigation may be needlessly dragged out, and that action is needed in a timely manner given the recent increases in contaminant levels in WMA 26. Mr. Frye stated that the Navy will be moving ahead with some related activities independent of the CRC work. An updated site conceptual model will be developed using both Navy and CRC data, and may be used to determine relative contributions of contamination to WMA 26.

Ms. Kathy Davies (EPA hydrogeologist) asked whether PADEP can push CRC to remove any DNAPL found in onsite wells. Mr. Buterbaugh and Mr. Clark indicated that PADEP can push for it but cannot force it at this point in the process. Mr. Frye asked Mr. Fennimore if he had the most recent sampling results for WMA 26 – Mr. Fennimore indicated that he did not.

Mr. Frye suggested that a conference call be held after the March 3 meeting between PADEP and CRC to update the RAB on the project status and discuss any key issues. A tentative date and time of March 11 at 9:30 was selected for a conference call. Mr. Clark is to confirm the conference call date/time with Mr. Frye after the March 3 meeting. Mr. Buterbaugh suggested

that the Navy and/or WMA consider approaching CRC directly regarding cost sharing. Mr. Frye stated that he and Mr. Lewandowski would discuss the idea with Navy legal counsel. Ms. Davies asked whether there would be any EPA involvement in the discussions. Mr. Orenshaw stated that he would like to have Charlene Creamer (EPA site assessment group) or someone else in the site assessment group involved.

WMA Update

Mr. Fennimore indicated that there was no significant progress since the previous meeting. The design for the treatment system upgrade has been completed but has not been put out to bid yet.

Treatment Plant Operation/LTM

Mr. Streetsmith provided an update of various treatment plant operation and maintenance activities, recent LTM activities and results, and optimization plans/activities for both the treatment system and LTM program, and several new activities assigned to ECOR by the Navy, including:

- Groundwater treatment plant status and upgrades (including installation of a new air stripper in September 2008).
- LTM and reports update.
- Area A extraction well update – EW-A19.
- Land Use Control Implementation Plan (LUCIP) and inspections.
- Well decommissioning work.
- Offsite well surveys and preparation of legal descriptions.
- NIRIS data conversion.
- Well pump and resin filter evaluation.
- Battelle 2008 Optimization Report recommendations.

The ECOR update is provided as Attachment 3 to the minutes.

Following the presentation, there was a general discussion of various related topics. Ms. Davies asked that the January sampling results for the new wells be emailed to the RAB as soon as they are available. Mr Frye asked when the new extraction well went online – Mr. Matt Lapp (ECOR) indicated that the well has been online since December 19. Mr. Orient asked whether the total pumping rate for Area A extraction wells is higher now – Mr. Streetsmith indicated that pumping rates for some wells had been turned down to balance out the flow from the new well, as there is

an issue with flooding of the collection/transfer sump if the total pumping rate increases alot. Mr. Lapp stated that the January pumping rate for Area A was 62 gpm. In regards to the well decommissioning and well survey activities, Mr. Streetsmith stated that ECOR is still trying to obtain access to some of the offsite wells.

The NIRIS data conversion and related topics were briefly discussed. Mr. Frye stated that the Land Use Control (LUC) tracker will be part of NIRIS, i.e. LUCs will be part of the NIRIS database for each base. Ms. Davies asked who will have access to the NIRIS database – Mr. Frye indicated that the process involves obtaining a password and submitting an application. Access is pretty straightforward for U.S. Government employees, government contractors can access the site with another step or two, but the site is not intended for public access. Mr. Toby Kessler ((Gilmore and Associates, Warminster Township consultant) asked whether LUC questions can be sent to the Navy for resolution – Mr. Frye stated that was correct and also added that the LUC Implementation Plan (LUCIP) for Warminster will be available later this year.

Regarding the Battelle recommendations, Ms. Davies asked whether monitoring well nest HN-69S/D was replaced by new well nest HN-73S/D (HN-69S/D was converted to the new extraction well after the new well boring was determined to be unacceptable for use as an extraction well and was converted to a monitoring well nest), and whether the new well nest would be added to the long term monitoring program. Mr. Streetsmith replied affirmatively to both issues. Mr. Orient pointed out that there is already a well cluster HN-73S/D in Area D, therefore the new well cluster should be given a different designation. Mr. Ron Sloto (USGS) stated that the newest well installed prior to the recent Area A drilling work was HN-105, drilled in Area C, therefore the new well nest should be HN-106S/D.

Mr. Clark asked whether the carbon units currently being used for supplemental groundwater treatment will be eliminated altogether once the new higher-efficiency stripper is online, further suggesting that they remain inplace in case they are needed in the future. Mr. Streetsmith indicated that the vessels would be eliminated from the treatment process, then Mr. Lapp elaborated by stating that the vessels would be emptied but not removed from the system altogether. Mr. Schauble pointed out that the carbon needs to be removed as it will degrade over time.

There was a general discussion regarding adjustment of the Area A extraction system flow rates. Mr. Streetsmith stated that the maximum total rate that can currently be pumped is 62 gpm because of the collection sump pumping rate limitation. Mr. Orient indicated that the treatment system can handle a higher flow. Ms Davies recommended that the sampling data for the new

extraction well be reviewed, a pumping rate set based on the sampling results, then pumping rates for other wells adjusted as necessary to stay within the system limitations. Mr. Lapp indicated that the collection sump has both primary and backup sump pumps and that they recently switched over to the backup pump because the primary pump wasn't keeping up with the influent rate.

For the long term monitoring, there was a general agreement that sampling in Area C should switch over from a quarterly to semiannual schedule after the next sampling round. For Area A, the Navy would continue with two more quarterly sampling rounds, and then switch over to semiannual sampling. Streamlining of the monitoring reports can be implemented immediately. Mr. Frye stated that he would direct ECOR to revise the LTM plan accordingly, with Tetra Tech to perform an overall LTM program update at a later point. Mr. Orient suggested that a section be added to the next two Area A reports detailing the new extraction well data and observations. Mr. Frye asked Mr. Schauble what ECOR was planning in regards to reports documenting the changes being made to the groundwater remediation system. Mr. Schauble indicated that one report would be prepared focusing on the new extraction well and a second report would be prepared focusing on the other modifications.

Miscellaneous Topics and Issues – Action Items

Action Items identified through the course of the meeting include:

- PADEP is to set up a conference call (tentatively March 11) to discuss CRC issues.
- The Navy is to send out copies of the PADEP comment letter regarding the CRC investigation/report.
- ECOR is to email out the Area A sampling results for the new wells and the Area C and Area D sampling data tables.
- ECOR is to draft a letter for Navy signature detailing the agreed upon changes to the LTM program.

Next Meeting Date

The next RAB meeting date was set for May 6, 2009 at 9:30 AM in the WMA Board Room.

The meeting was adjourned at approximately 11:00 AM.

**ATTACHMENT 1
ATTENDANCE LIST**

NAWC WARMINSTER
 TECHNICAL SUBCOMMITTEE/RAB MEETING
 DATE: 2/11/09

| NAME | AFFILIATION | PHONE | EMAIL |
|-------------------|-------------------------|--------------------|---------------------------------|
| JEFF ORIENT | TETRA TECH NUS | 412/921-8778 | jeff.orient@tetratech.com |
| CURT FRYE | NAVY BRAC PMO | 215-897-4914 | curtis.frye@navy.mil |
| Kathy Davies | USEPA | 215-814-3315 | davies.kathy@epa.gov |
| Ron Sloto | US Geological Survey | 610-321-2437 x212 | RASLOTO@USGS.GOV |
| Tom BUTERBAUGH | PA-DEP | 484-250-5790 | tbutterbaugh@state.pa.us |
| Charles Clark | PADEP | 484-250-5731 | cha.clark@state.pa.us |
| DENNIS ORENSHAW | US EPA | 215-814-3361 | ORENSHAW-DENNIS@EPA.GOV |
| Parrick Schauble | ECCR Solutions | 484-887-7510 | Schauble@eccr-solutions.com |
| Bob Lewandowski | US Navy BRAC PMO | 215-897-4908 | robert.f.lewandowski@navy.mil |
| Chris Candela | ATC/ERICUSON | 610 313 3100 x 495 | chris.candela@atcassociates.com |
| Toby Kessler | Gilmore&Assoc./Warm.Twp | 215 345 4330 | tkessler@gilmore-assoc.com |
| Dave Ferrimore | Earth Data | 610 524-9466 | dferrimore@earthdata.com |
| David Streetsmith | ECOR | 484 887 7510 x 206 | dstreetsmith@ecor-solutions.com |
| Matt Lopp | EGOR | 484-887-7510 x 207 | lopp@ecor-solutions.com |
| NORM KELLY | RAB | (215) 675-4157 | N. A. |
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**ATTACHMENT 2
MEETING AGENDA**

**NAWC WARMINSTER
TECHNICAL SUBCOMMITTEE/RAB MEETING**

11 February 2009 9:30 AM

WMA Board Room

415 Gibson Ave

Warminster, PA

MEETING AGENDA

Administrative Update

- Minutes of the Last Meeting
- Review Action Items (**see below**)

Off-Site Investigations

- PADEP update on CRC Chemicals

WMA Update

- Status of Wells #13 and #26 treatment upgrades.

Treatment Plant Operation/LTM

- Plant operating status
- LTM/LTMP update
- Status of Quarterly Monitoring Reports
- Treatment plant upgrades status

Other Activities

- ECOR presentation on current/upcoming work activities:
 - New extraction well A19
 - Land Use Control Plan and inspections
 - Well abandonment work
 - Offsite well surveys and preparation of legal descriptions.
 - Extraction well pump evaluations
 - Evaluation of select groundwater treatment plant operations
 - Conversion of monitoring data to suitable electronic formats for uploading into the Navy's NIRIS database, and maintenance of the NIRIS electronic database for the site.

Miscellaneous Topics and Issues – Action Items

Time and Location of Next Meeting: - Date to be determined

**ATTACHMENT 3
ECOR PRESENTATION**



ECOR Solutions, Inc.

Restoration Advisory Board Meeting for NAWC Warminster

11 February 2009

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Presentation Agenda

- GWTP Status and Upgrades
- LTM and Reports Update
- Area A Extraction Well – EW-A19
- Land Use Control Plan and Inspections
- Well Decommissioning Work

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Presentation Agenda (Continued)

- Offsite Well Surveys and Legal Descriptions
- NIRIS Data Conversion
- Well Pump and Resin Filter Evaluation
- Battelle 2008 Optimization Report Recommendations

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Groundwater Treatment Plant Operating Status

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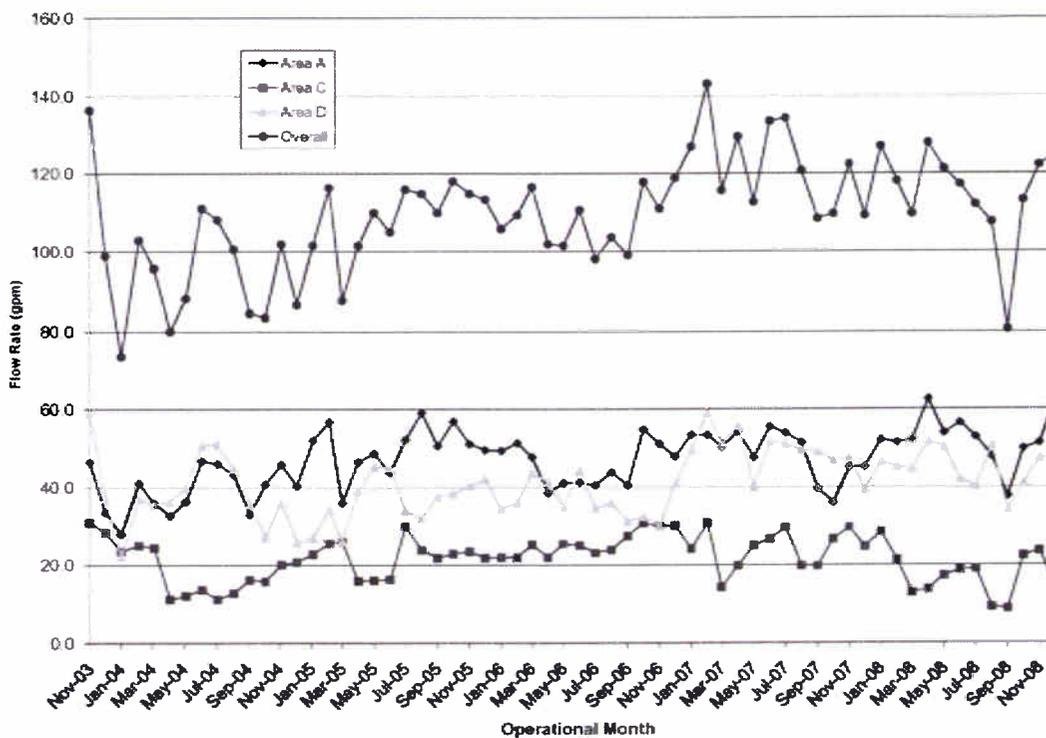
- Average Flowrates in 2008:
 - 53 gpm from Area A
 - 18 gpm from Area C
 - 45 gpm from Area D
 - 115 gpm overall
- 592,358,960 gallons recovered and treated (1999 start up through December 2008)
- System up-time >95%

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Groundwater Treatment Plant Recovery Flow Rates



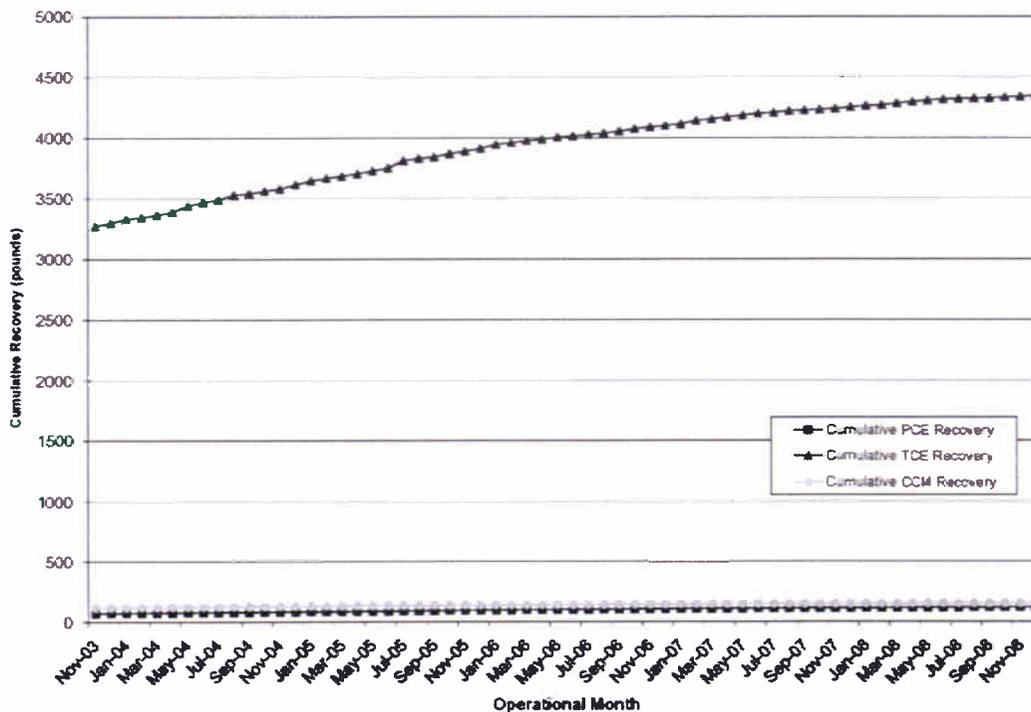
- Cumulative dissolved-phase VOC recovery through December 2008 reporting period:
 - Tetrachloroethene (PCE) – 119 pounds
 - Trichloroethene (TCE) – 4,346 pounds
 - Carbon Tetrachloride (CCl₄) – 150 pounds
- Currently most of TCE recovered is from Area A with the remainder from Area D

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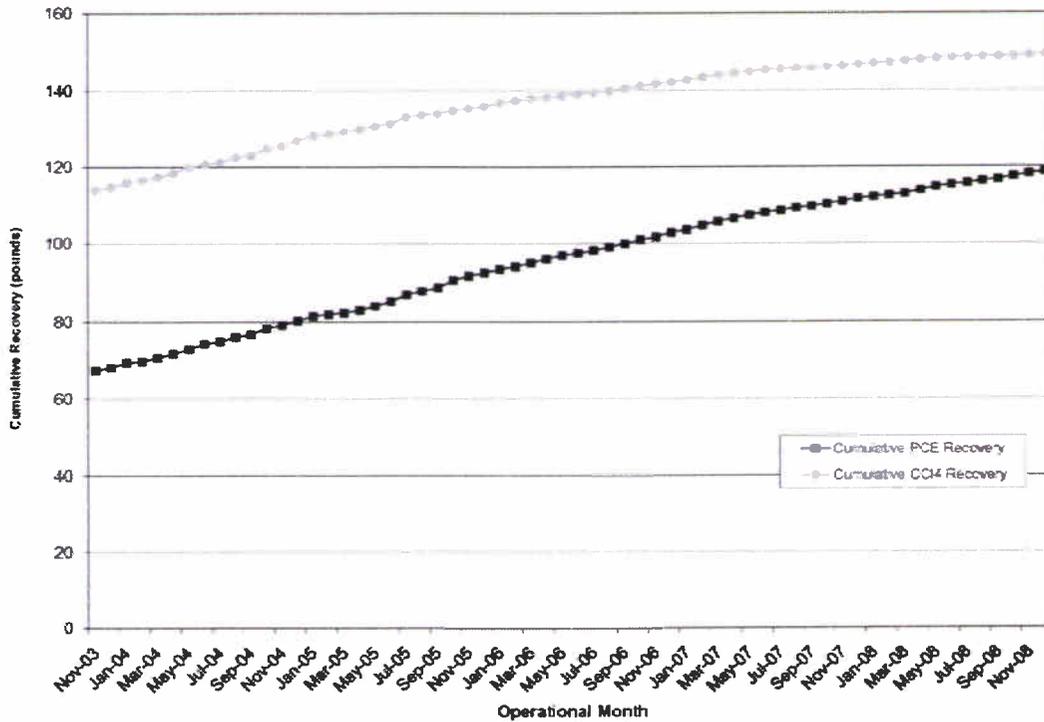
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Dissolved-phase Cummulative Mass Recovery



Dissolved-phase Cumulative Mass Recovery



GWTP Upgrades

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- Installed new air stripper (Sept 2008)
 - Not meeting performance specs
 - Working with vendor to remedy

- Liquid-phase GAC still on-line
 - Eliminate liquid-phase GAC and dispose of carbon after optimization of air stripper

Long Term Monitoring Status

- **Sampling events completed by ECOR:**

- 2nd Quarter FY 2009 (Quarterly) – January 2009

- **Recent reports submitted:**

- 4th Quarter FY 2008 (Quarterly) – Final - November 2008
- 1st Quarter FY 2009 (Semi-Annual) – Draft – January 2009

- **Reports in progress:**

- 2nd Quarter FY 2009 (Quarterly)



Area A Extraction Well - EW-A19

- TEG approved setting EW-A19 at HN-69 location
- HN-69S/D was overdrilled with a 10-inch air hammer to 101 ft, effectively removing cluster
- 6-inch SS extraction well (EW-A19), the well got jammed in the borehole and would not go to depth
- Could not overdrill the borehole to a larger diameter because of 10-inch steel surface casing set into bedrock
- Didn't have 4-inch SS, used 4-inch PVC

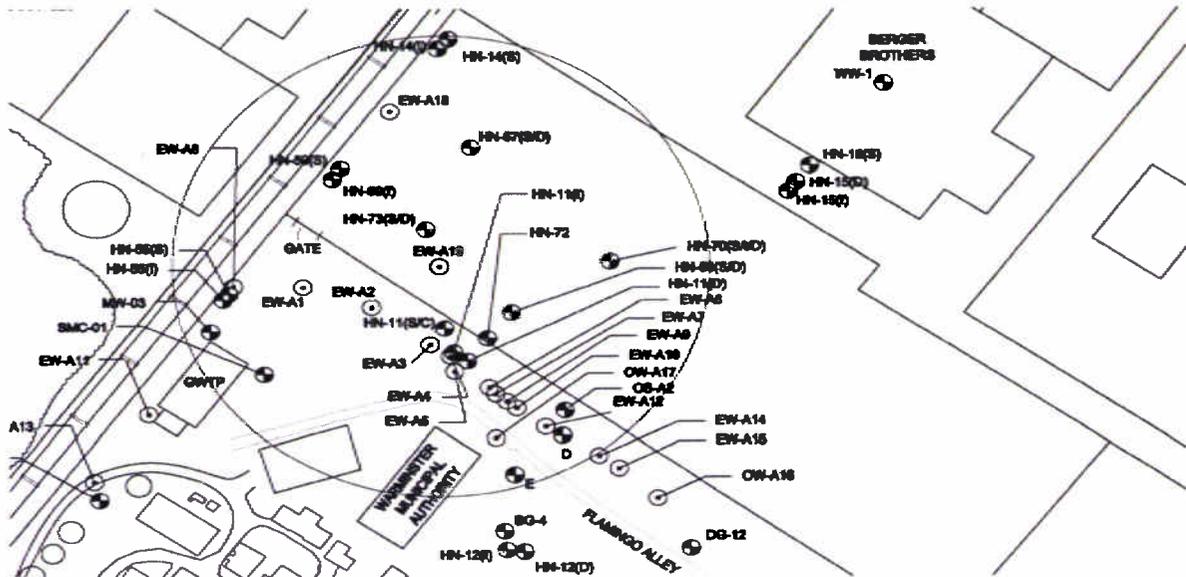


Area A Extraction Well - EW-A19

- Installed 4-inch PVC well to 100 ft bgs
- Completed yield test >14.5 gpm
- Collected sample – January 26, 2009
- Connected to Area Extraction System
- Current pumping rate ~ 10 gpm

Area A Monitoring Well Cluster – HN-73S/D

- Shallow 2-inch PVC well to 45 ft bgs
- Deep 2-inch PVC well to 95 ft bgs
- Collected samples – January 26, 2009



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Land Use Control Plan and Inspections

- Draft LUCIP submitted – preparing parcel map
- Performed LUCIP Inspections 30 Dec 2008
- Identified minor areas to repair in Area B
- Preparing LUC Report for 2008

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Well Decommissioning

- Permanently close up to 58 wells in accordance with PADEP guidelines
 - Area A – 7 wells
 - Area D – 7 wells
 - Area C – 7 wells
 - Area B – 37 wells
- Provide letter report

Well Surveys and Legal Descriptions

- Provide Surveys
- Provide Legal Descriptions
- 13 wells on non-Navy property
 - HN-5, HN-16, HN-19, HN-52, HN-53, HN-54, HN-66, HN-100, OB-13, R4, R6, R7, R9

NIRIS Monitoring Data

- Convert and migrate Warminster groundwater data in electronic format to NEDD
- Working with TtNUS to create database forms
- Convert geospatial data to the ESRI format
- Coordinate data will be in State Plane Coordinate System NAD 83
- Maintain NIRIS through March 2010 (Includes uploading new data on a quarterly basis)

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Battelle Recommendations for Long Term Monitoring and Operations & Maintenance

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- 2007 Optimization Report
- 2008 Resin Filter evaluation
- 2008 Well Pump evaluation

Battelle Recommendations Completed

- Metals removal equipment offline
- Collecting hex chromium samples from the ion exchange influent and effluent on a monthly basis to monitor treatment effectiveness.
- Upgraded computer software to facilitate remote login
- Discontinued pumping from EW-D4 in Area D.
- Obtained Final NPDES Permit
- Inspecting EW-A13. Adjust flow rate

Battelle Recommendations Completed (con't)

- Reprogrammed VFD to respond to changing water level heights in EQ tank
- Submitted RFD Application for Air Permit Exemption
- Operating VGACs in parallel and added a unit in series
- Removed HN-69 S/D from the monitoring program
- Created a historical database and submitting with quarterly reports
- Installing a new extraction well near monitoring well HN-69D

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Battelle Recommendations In Progress

- Replacing pressure gauges at well heads
- Installing new air stripper w/ higher capacity and efficiency
- Assessing ion exchange unit – flow rates, pH, resin

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Battelle Recommendations Not Done

- Adjusting the current extraction well flow rates in Area A
- Adjust water level set points in Area A
- Turning on EW-A5 and EW-A9
- Bypass LGACs and remove carbon
- Add heat-dissipating flow sleeves to all pumps – to be completed during routine pump replacement
- Have electrician evaluate phase-converter

Battelle Recommendations Not Done (con't)

- Reducing monitoring frequency of upgradient monitoring wells in Area C (BG-05A, HN-23A, HN-27S, and HN-28S) from quarterly to semiannually
- Reduce sampling frequency to semiannually in Area C extraction wells
- Implement quarterly monitoring in Areas A and D transect wells for two quarters following pump rate modifications then switch to semiannual monitoring
- Streamline monitoring reports