



TETRA TECH

PITT-12-08-039

December 17, 2008

Project Number 0182

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 November 12, 2008  
Former Naval Air Warfare Center (NAWC) Warminster, Pennsylvania

Dear Mr. Frye:

Enclosed please find the minutes from the RAB meeting held on November 12, 2008. 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/sic

Enclosure

c: Ron Sloto (USGS)  
Charles Clark (PADEP)  
Tom Buterbaugh (PADEP)  
Toby Kessler (Gilmore & Associates)  
Dave Fennimore (Earth Data)  
Garth Glenn (TtNUS)  
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.

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

**RESTORATION ADVISORY BOARD (RAB) MEETING NO. 112**

**REFERENCE: CLEAN CTO NO. 041**

1. Meeting Date and Time: November 12, 2008, 9:45 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 August 13, 2008 RAB meeting minutes. No comments were offered by those in attendance and the meeting minutes were approved as-is.

Action items from the August 13, 2008 RAB meeting were reviewed. The action items from the August 2008 meeting are summarized below:

**1. PADEP is to provide copies of the CRC RI Report to the U.S. EPA, Navy, USGS, and WMA.**

Mr. Charles Clark (PADEP project manager) indicated that the report is in-house and has been reviewed (but has not yet been provided to the EPA, Navy, or USGS). He indicated that it will be denied as a final product, as more investigation work needs to be done. Mr. Dave Fennimore [Earth Data; Warminster Municipal Authority (WMA) consultant] indicated that he has reviewed a copy of the report and provided a short overview. He has several concerns, most notably the drilling approach being taken in light of the potential DNAPL presence and an overall lack of effort by the PRP to get WMA more involved in the process. In addition, Mr. Fennimore was concerned about perceptions regarding the operation of municipal well WMA 26 as a potential component of the CRC remediation efforts. He indicated that PCE has now become the primary

contaminant of concern at WMA 26 due to the steady increase in concentration that has been observed, and is being detected at concentrations that are getting close to the maximum level that the WMA 26 treatment system can handle. Mr. Fennimore asked Mr. Clark for his support in addressing the drilling issue in particular. CRC is required to apply to WMA for well drilling permits, which will be denied if the Navy-established drilling protocols for Area A aren't followed. Mr. Toby Kessler (Gilmore and Associates; Warminster Township consultant) stated that he had requested a copy of the RI Report from CRC's consultant ERM, as the township has vapor intrusion and land use concerns.

Mr. Frye asked Mr. Clark about whether PADEP had looked into the issue regarding whether the site should stay within the Act 2 program in light of what has been found [Mr. Tom Buterbaugh (PADEP) had indicated in the August 2008 RAB meeting that he would be looking into this issue]. Mr. Fennimore suggested that since it is part of a Superfund site with a co-mingled plume it should not be handled through the Act 2 process. Mr. Frye indicated that he plans to task Tetra Tech NUS with preparing an updated conceptual model of the area, combining Navy data with the new CRC data to identify key data gaps relative to understanding interconnections (or lack thereof) between the Navy and CRC sites. Mr. Clark stated that he would send out copies of the CRC report, along with PADEP comments, for Navy review. Mr. Bob Lewandowski (Navy BRAC PMO) reiterated that the Navy is willing to share any data that they have with CRC and their consultant.

**2. TtNUS is to send hard copies of the Navy's well drilling plan for Area A that was developed by Foster Wheeler with TEG input to Ms. Davies, Mr. Fennimore, and Mr. Buterbaugh.**

Mr. Jeff Orient (Tetra Tech NUS project manager) indicated that the drilling plan was provided as per the action item.

**3. Mr. Orenshaw will evaluate whether the CRC site investigation should include RCRA involvement, and will check to see what the OU-1A ROD includes regarding offsite control of drilling activities.**

Mr. Frye indicated that he had received a message from Mr. Dennis Orenshaw (EPA Project Manager) stating that EPA could step in under RCRA, but would prefer to allow PADEP to maintain lead agency status. Mr. Orenshaw is still looking into the OU-1A ROD language r.e. controls on well drilling. Mr. Lewandowski recalled that the ROD had language calling for the

Navy to ensure that a permit process was in place with Warminster Township and Ivyland Borough to control drilling within the area of the plume.

**4. EPA and PADEP are to provide updates regarding offsite investigations at the next RAB meeting.**

Mr. Frye stated that he had received a message from Mr. Orenshaw stating that EPA has turned up no potential sources in the Louis Drive area other than CRC. The PADEP update is presented under Action Item 1 above.

**5. Mr. Fennimore is to provide recent sampling data for WMA-26 to ECOR.**

Mr. Fennimore indicated that he has not yet provided the data, but will do so shortly. The most recent (October 2008) sampling data for WMA 26 indicated a PCE concentration of 579 ug/l and a TCE concentration of 52 ug/l. No 1,4 dioxane or carbon tetrachloride was detected.

**6. ECOR is to update the historic sampling data table with up-to-date results and send it out to the RAB.**

Mr. David Streetsmith (ECOR hydrogeologist) indicated that the Area A summary data table has been sent out, and data tables for Areas C and D will be sent shortly.

**7. ECOR is to prepare/submit the work plan for the new Area A extraction well.**

The work plan was prepared and submitted as per the action item.

**Off-Site Investigations**

The status of offsite investigations was discussed during the action item review.

**WMA Update**

The WMA update was provided as part of the action item review.

### 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 update.
- Installation of a new extraction well (EW-A19) in Area A.
- Land Use Control Implementation Plan (LUCIP) and inspections.
- Catch basin cleanouts in Area B (OU-10).
- Well abandonment work.
- Offsite well surveys and preparation of legal descriptions.
- Repairs to Area C extraction well vaults.
- 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.

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

Following the presentation, there was a general discussion of various related topics. The timing of the implementation of planned changes to the LTM program was discussed. Mr. Streetsmith indicated that ECOR was waiting until the new Area A extraction well was online to implement any changes to the LTM program. Ms. Kathy Davies (U.S. EPA hydrogeologist) suggested that the planned LTM changes for Area C be implemented earlier, as the new extraction well will not impact Area C in any way.

As per the presentation, ECOR had performed a short term pumping test in HN-69D to evaluate it as a possible alternate extraction well since the new well boring drilled did not appear to have a good hydraulic connection with the zone of highest groundwater contamination. For the HN-69D pumping test, Mr. Orient asked how much drawdown was generated at the 4 gpm pumping rate – Mr. Streetsmith indicated that there was approximately 2.5 feet of drawdown, with a TCE concentration of around 500-600 ug/l, which is somewhat less than expected based on past sampling results. Mr. Orient suggested that the pumping test concentration is likely a dilution effect resulting from pulling some water from the EW-A1/A2 area where TCE concentrations are lower. Ms. Davies pointed out that EW-A1 and A2 are aligned approximately along bedrock strike

from HN69D, and preferential drawdown along strike is common for pumping wells in this type of geologic setting. Mr. Kessler asked at what depth water was being produced in the new well boring that was drilled near HN-69D in Area A – Mr. Streetsmith stated that the water was from a depth of around 40 feet, and had minimal (~ 5 ug/l) TCE. Mr. Frye asked for opinions regarding the conversion of HN-69D to an extraction well in place of drilling another well boring in the area – the consensus was that HN-69D should be overdrilled and converted into the new Area A extraction well, with the screened interval of the new extraction well the same as the current screened interval for HN-69D. Mr. Streetsmith is to document this agreement via email.

For the NIRIS update, ECOR is still working at getting the data loaded into NIRIS.

### **Miscellaneous Topics and Issues – Action Items**

Action Items identified through the course of the meeting include:

- PADEP is to send out copies of the CRC RI Report, along with PADEP's comments.
- PADEP is to set up a conference call or meeting to discuss CRC issues.
- ECOR is to send out an email documenting the decisions reached at the RAB meeting regarding the new extraction well in Area A.
- EPA is to check the OU-1A ROD language regarding control of offsite drilling activities.
- Earth Data is to provide the recent WMA Well 26 sampling data to ECOR.
- ECOR is to send out the Area C and Area D sampling data tables.

### **Next Meeting Date**

The next RAB meeting date was set for February 11, 2009 at 9:30 AM in the WMA Board Room.

The meeting was adjourned at approximately 11:00 AM.

**ATTACHMENT 1  
ATTENDANCE LIST**



**ATTACHMENT 2  
MEETING AGENDA**

**NAWC WARMINSTER  
TECHNICAL SUBCOMMITTEE/RAB MEETING**

**12 November 2008 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**

- EPA update on Louis Drive assessments
- PADEP update on CRC Chemicals

**WMA Update**

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

**Treatment Plant Operation/LTM**

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

**Other Activities**

- ECOR presentation on current/upcoming work activities
  - New extraction well A19
  - Land Use Control Plan and inspections
  - Catch basin cleanouts at OU-10
  - Well abandonment work
  - Offsite well surveys and preparation of legal descriptions.
  - Area C extraction well vault piping replacements
  - 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**

## **Action Items**

The following action items were identified at the wrap-up of the August 2008 meeting:

- PADEP is to provide copies of the CRC RI Report to the U.S. EPA, Navy, USGS, and WMA.
- TtNUS is to send hard copies of the Navy's well drilling plan for Area A that was developed by Foster Wheeler with TEG input to Ms. Davies, Mr. Fennimore, and Mr. Buterbaugh.
- Mr. Orenshaw will evaluate whether the CRC site investigation should include RCRA involvement, and will check to see what the OU-1A ROD includes regarding offsite control of drilling activities.
- EPA and PADEP are to provide updates regarding offsite investigations at the next RAB meeting.
- Mr. Fennimore is to provide recent sampling data for WMA-26 to ECOR.
- ECOR is to update the historic sampling data table with up-to-date results and send it out to the RAB.
- ECOR is to prepare/submit the work plan for the new Area A extraction well.

### **Directions to the WMA Board Room:**

**From County Line Rd** - instead of turning north (right) onto Jacksonville, continue west on County Line to York Rd. Turn north (right) onto York Rd. Continue to Henry Ave. Turn west (left) onto Henry Ave. Continue to Gibson Ave. Turn right into the parking lot shared by the Warminster Township and WMA. The WMA building is located towards the rear.

**From the former NAWC** - proceed to the intersection of Street and Jacksonville Rd. Turn west (right) onto Street Rd. Continue west to York Rd. Turn south (left) onto York Rd. Continue to Henry Ave. Turn west (right) onto Henry Ave. Follow directions as above to the WMA building.

**ATTACHMENT 3  
ECOR PRESENTATION**



**ECOR Solutions, Inc.**

**Restoration Advisory  
Board Meeting for  
NAWC Warminster**

**12 November 2008**

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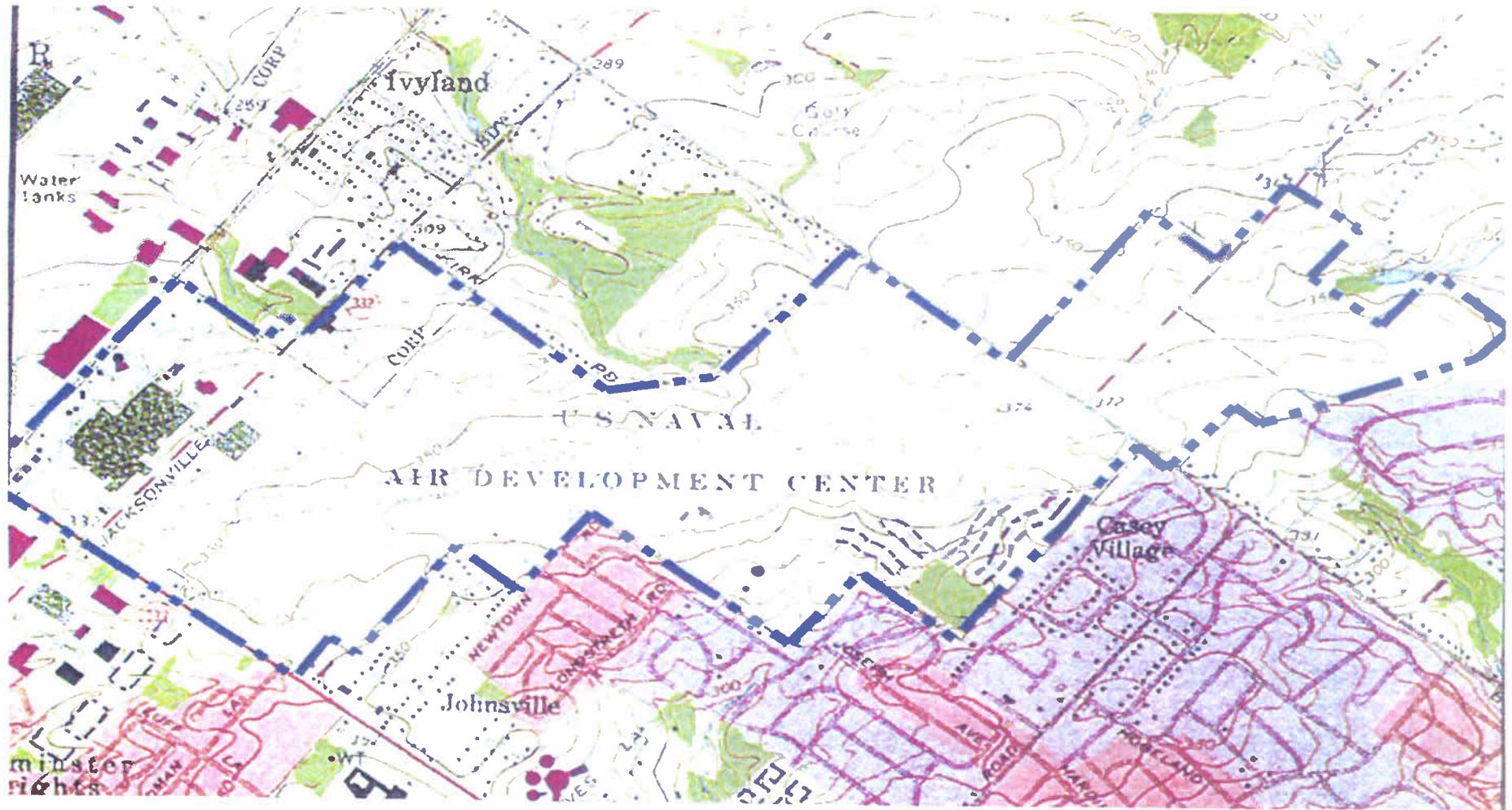
# Presentation Agenda

- GWTP Status and Upgrades
- LTM and Reports Update
- Area A Extraction Well – EW-A19
- Land Use Control Plan and Inspections
- Catch Basin Cleanout – OU-10

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# Presentation Agenda (Continued)

- Well Decommissioning Work
- Offsite Well Surveys and Legal Descriptions
- Area C Extraction Well Piping Replacement
- NIRIS Data Conversion
- Well Pump and Resin Filter Evaluation



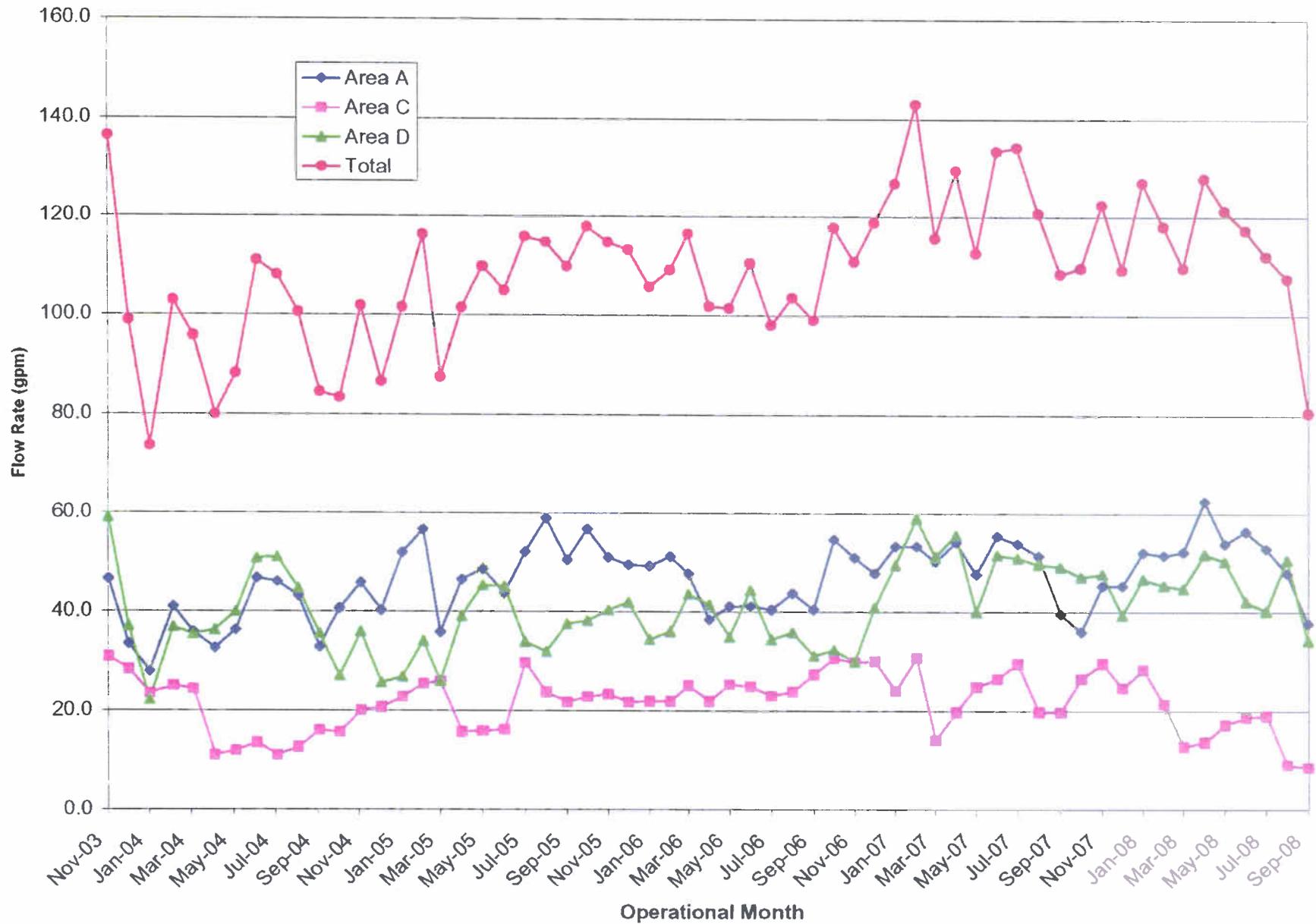
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# Groundwater Treatment Plant Operating Status

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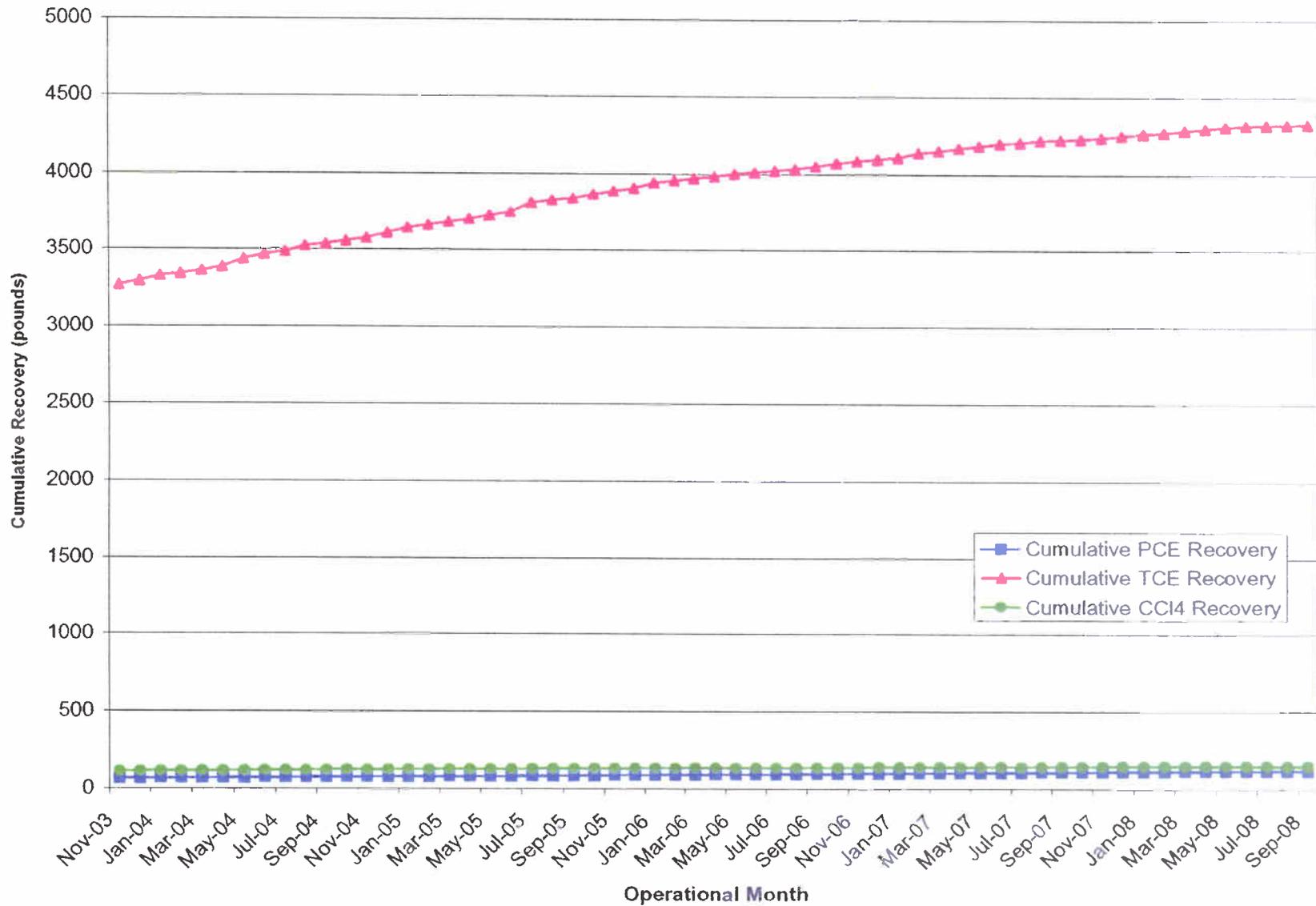
- Average Flowrates in 2008:
  - 52 gpm from Area A
  - 17 gpm from Area C
  - 45 gpm from Area D
  - 114 gpm overall
- 573,759,569 gallons recovered and treated (1999 start up through September 2008 reporting period)
- System up-time >95%

# Groundwater Treatment Plant Recovery Flow Rates

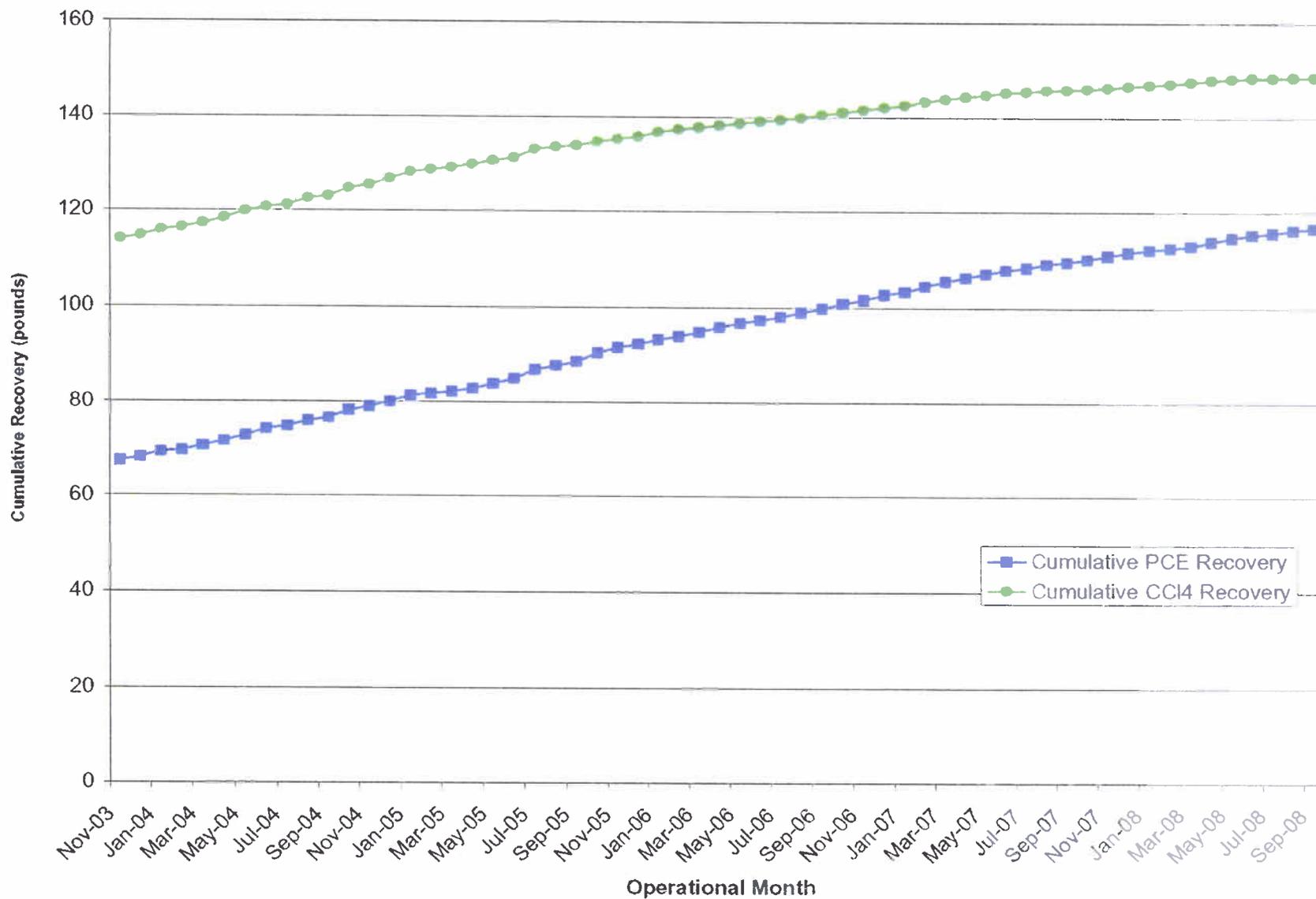


- Cumulative dissolved-phase VOC recovery through September 2008 reporting period:
  - Tetrachloroethene (PCE) – 117 pounds
  - Trichloroethene (TCE) – 4,327 pounds
  - Carbon Tetrachloride (CCl<sub>4</sub>) – 149 pounds
- Currently, 96.3% of TCE recovered is from Area A with the remainder from Area D

# Dissolved-phase Cumulative Mass Recovery



# Dissolved-phase Cumulative Mass Recovery



# GWTP Upgrades

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- Installed new air stripper (Sept 2008)
  - Fine tuning to maximize removal rates
- Liquid-phase GAC still on-line
  - Eliminate liquid-phase GAC and dispose of carbon

## Low-Profile Air Stripper AirRaider™ 3600 Series



### Product Level Control

Product Level Control manufactures a variety of low-profile air strippers, custom-equipped for optimal on-site performance. By offering flexible system designs with a wide range of available product parts and accessories, we meet your individual project goals for the best possible value.

#### FEATURES

Designed to meet client needs and budget

Efficiencies up to 99.9%

PowerClamp™ compression system creates a more reliable, water-proof seal

Easily collapsible and expandable – stackable trays are quickly disassembled for cleaning or maintenance

Polypropylene construction combats fouling

Delivered fully assembled; piped & wired

Factory wet-tested for reliable system operation



# Long Term Monitoring Status

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- **Sampling events completed by ECOR:**

- 1st Quarter FY 2009 (Semi-Annual) – October 2008

- **Recent reports submitted:**

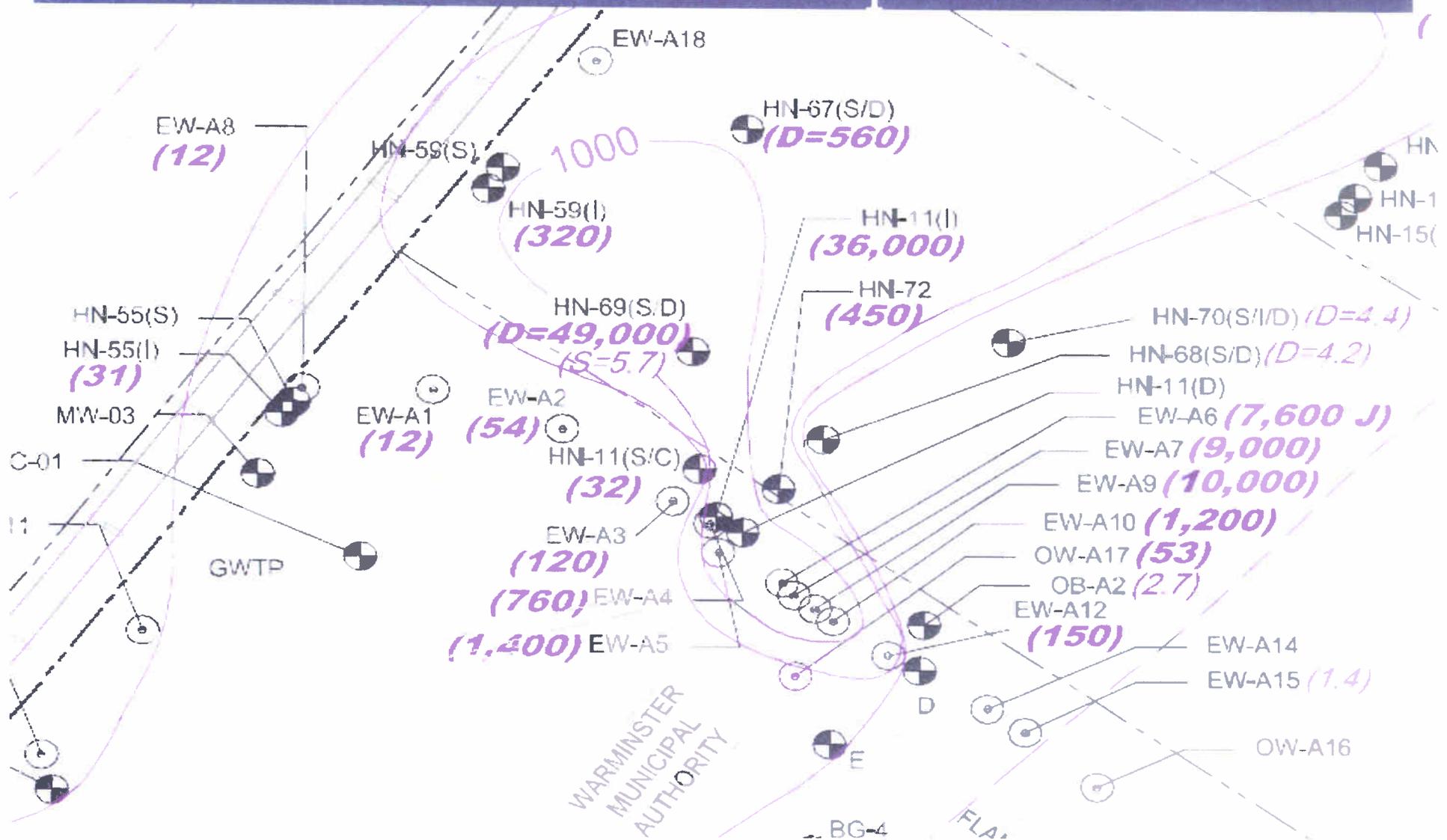
- 3rd Quarter FY 2008 (Annual ) – Final - October 2008
- 4th Quarter FY 2008 (Quarterly) – Draft - Sept 2008

- **Reports in progress:**

- 1st Quarter FY 2009 (Semi-Annual)

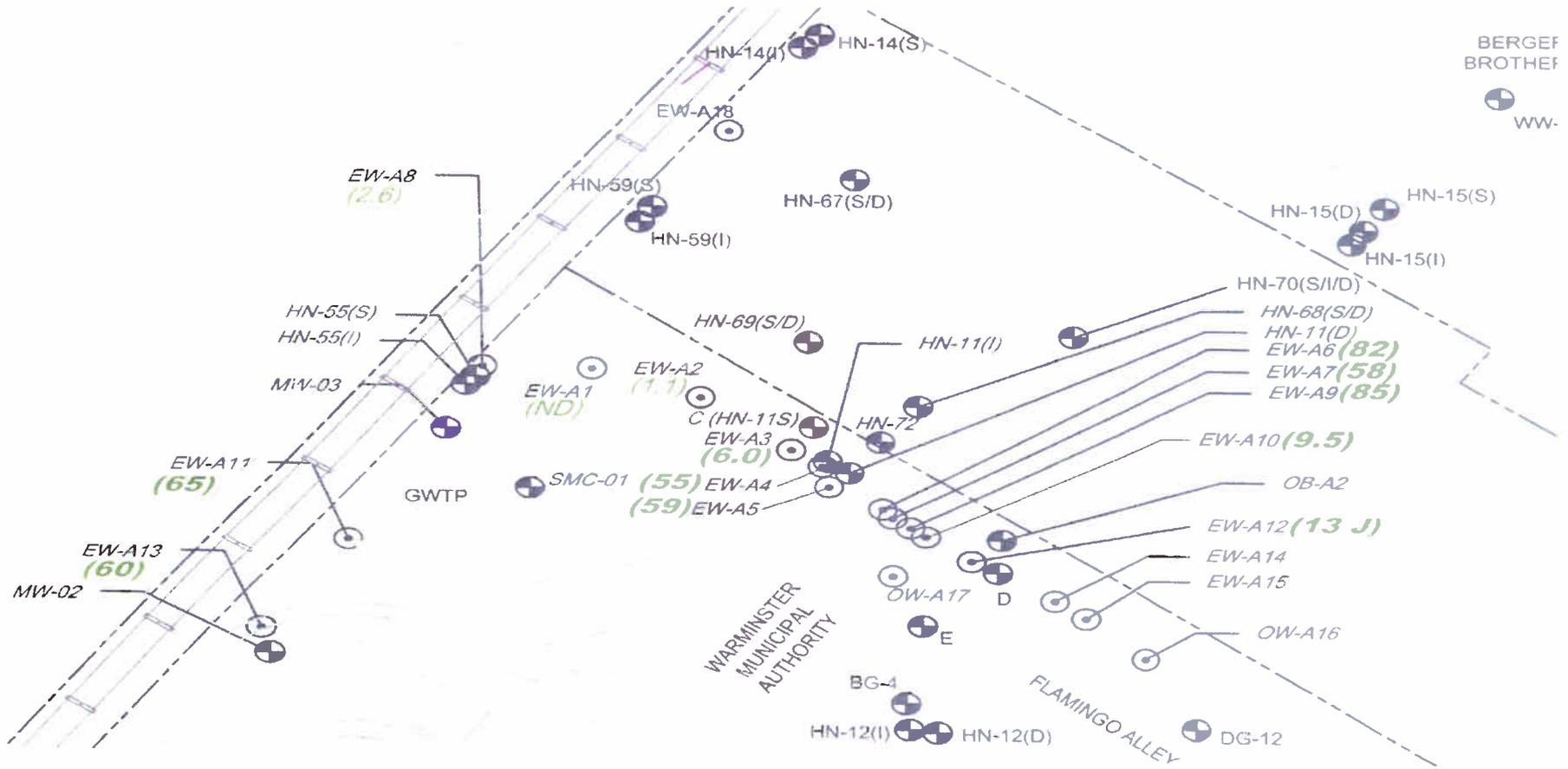


# Area A TCE - April 2008



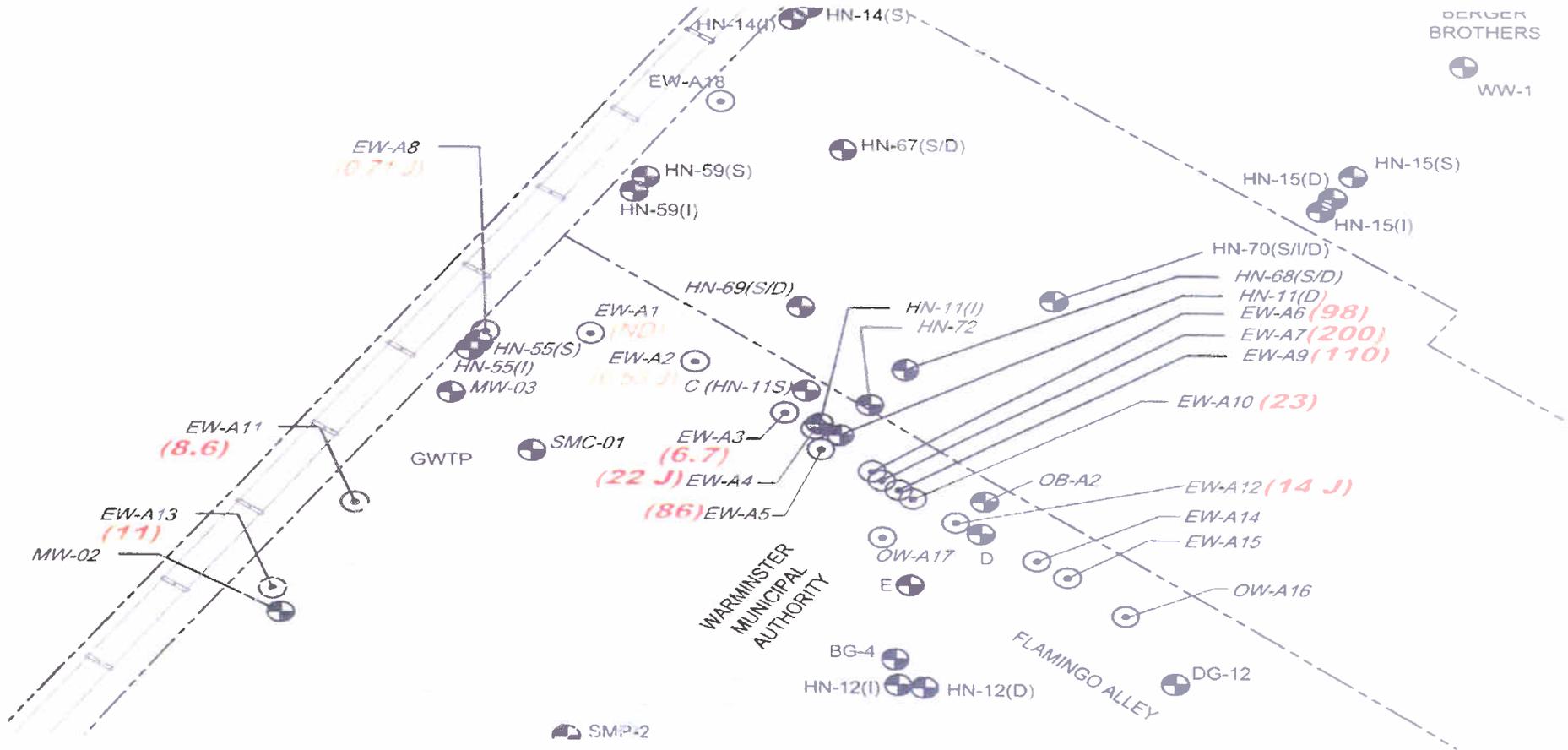
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# Area A PCE - July 2008



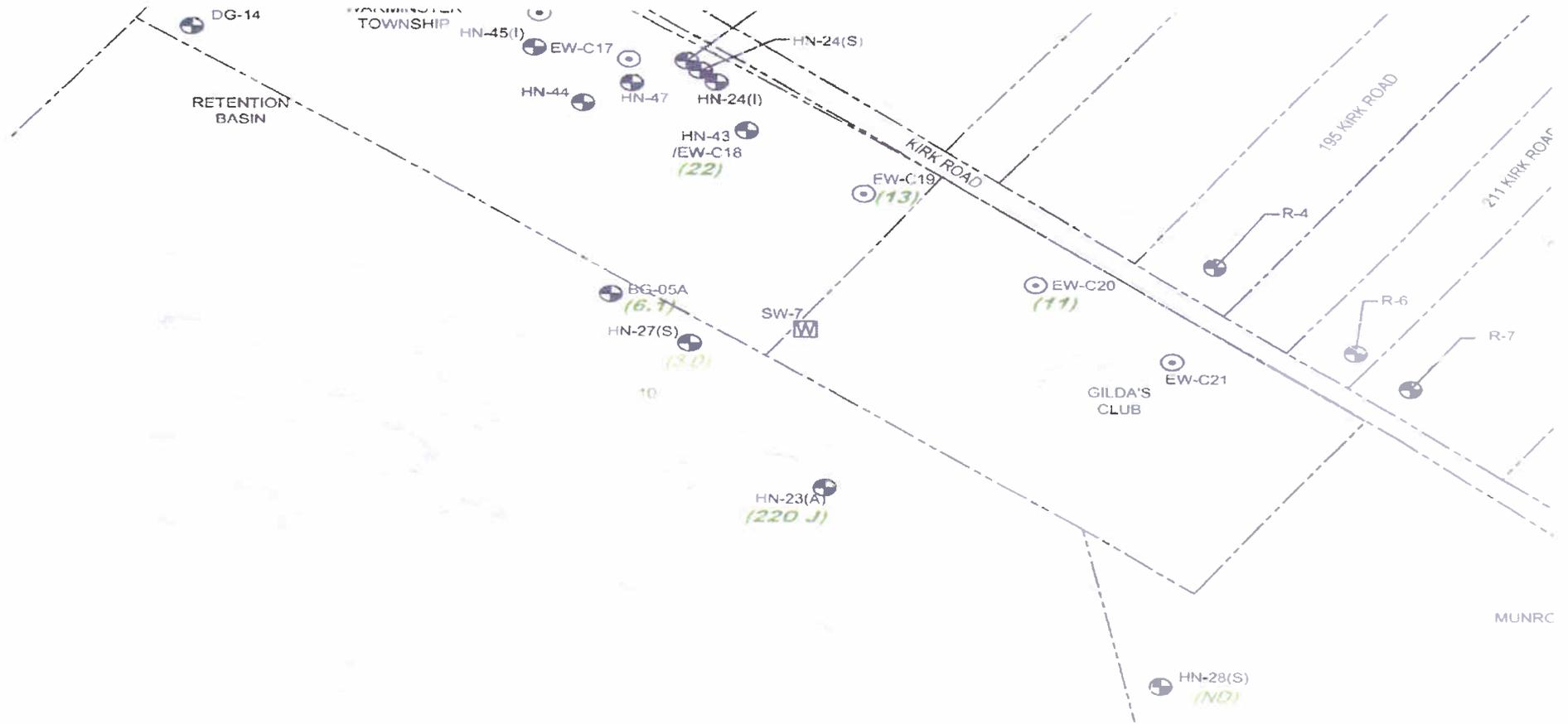
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# Area A CCL<sub>4</sub> - July 2008



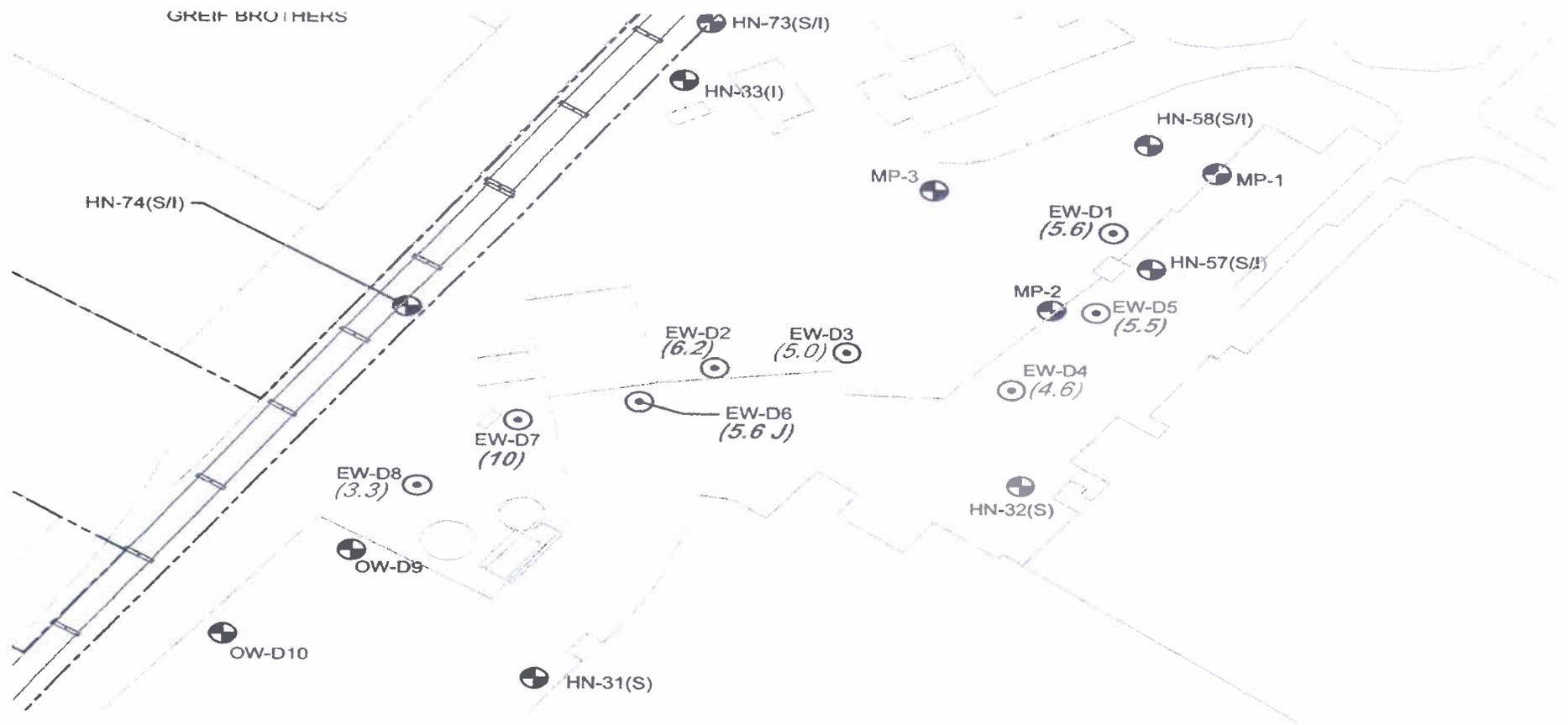
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# Area C PCE - July 2008



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# Area D TCE - July 2008



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“Optimization Report,  
Battelle, August 2007”

Recommendations  
for  
Long Term Monitoring

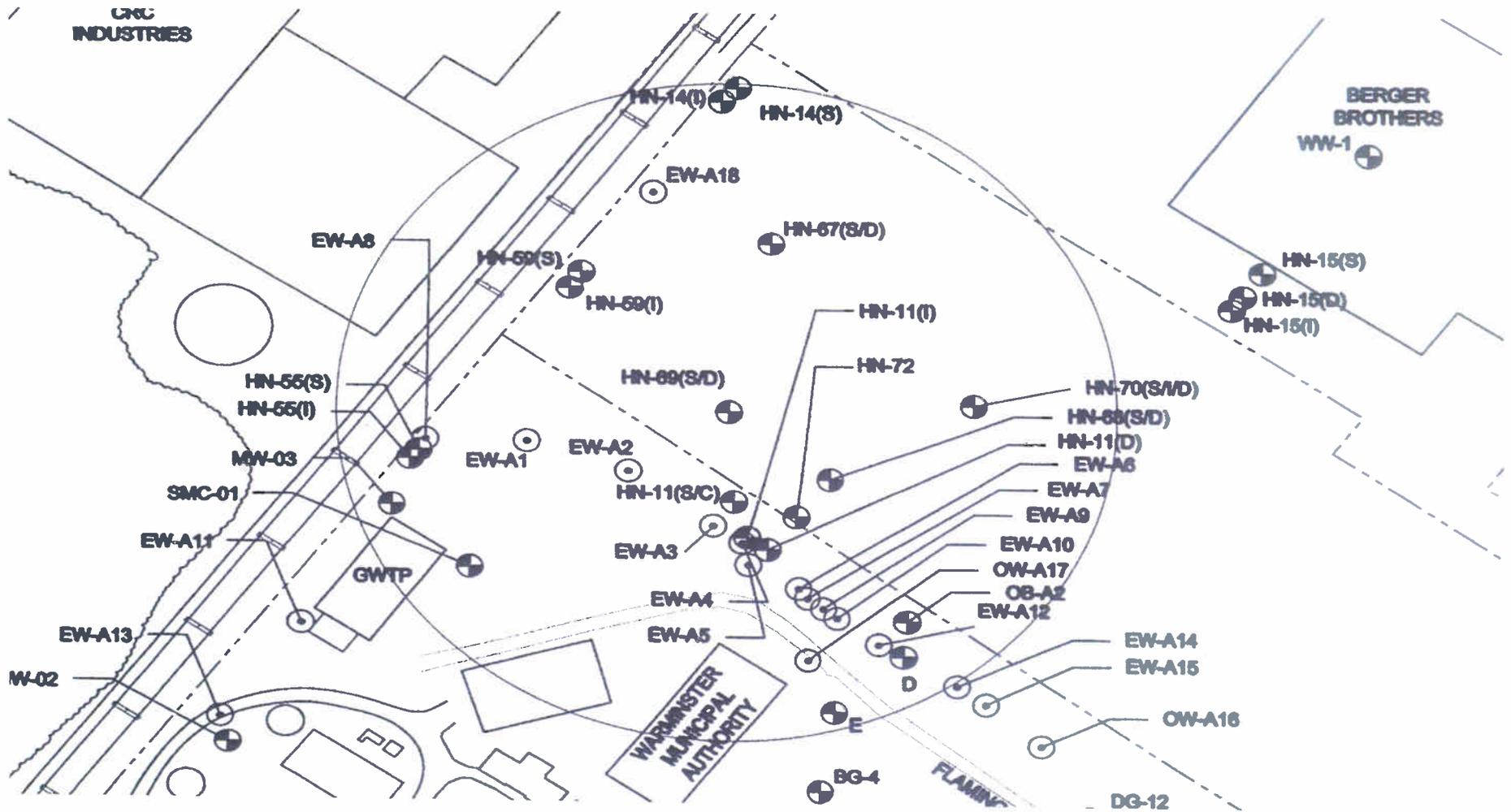
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# Recommendations In Progress

- Remove monitoring well HN-69S and HN-69D from the quarterly monitoring program in Area A
- Reduce the sampling frequency in Area C monitoring wells BG-05A, HN-23A, HN-27S, and HN-28S from quarterly to semi-annually
- Changes to take effect after installation of EW-A19

# Area A Extraction Well - EW-A19

- Drilled 10-inch borehole to 80 ft bgs
- Completed yield test – 14 gpm
- Observed drawdown in HN-69S and HN-69D
- Collected samples – low VOC levels
- Assess HN-69D –
  - Yield test >4 gpm
  - Moderate VOC Levels



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# Land Use Control (LUC) Plan and Inspections

- Draft LUC Implementation Plan (LUCIP) submitted
- Perform LUCIP Inspections of Sites 1-4 and Sites 6-9
- Perform LUC repairs as identified during inspections
- Prepare LUC Report for 2008

# Catch Basins at OU-10

- Cleaned out of sediment from two areas:
  - Catch basin for Sampling Station B32
  - Outfall for Sampling Station B31
- Characterize/Dispose sediment via government regulations
- Include documentation on LUCIP report

# 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

# Repaired Area C Extraction Wells

- Replaced piping (valves, sample ports, pitless adapters) and electrical boxes
- Replaced with PVC
- Replaced heat tracing
- Documented work in monthly O&M report

# NIRIS Monitoring Data

- Convert and migrate Warminster groundwater data in electronic format to NIRIS Electronic Data Deliverables (NEDD)
- 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)

# Resin Filter & Well Pump Evaluation

- Resin efficiency needs to be optimized
- Monitor Cr<sup>+6</sup> levels – 2-3 months
- Assess pH needs
- Well pumps still being evaluated