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PITT-11-6-037

November 16, 2006

Project Number 0182

Mr. Lonnie Monaco
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 1, 2006
Former Naval Air Warfare Center (NAWC) Warminster, Pennsylvania

Dear Mr. Monaco:

Enclosed please find the minutes from the RAB meeting held on November 1, 2006. 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)
April Flipse (PADEP)
Tony Sauder (Pennoni)
Dave Fennimore (Earth Data)
Garth Glenn (TtNUS)
Pat Schauble (ECOR)
Kathy Davies (U.S. EPA)
Carolyn Ohart (Battelle)
Norm Kelly (RAB Co-Chair)
Dennis Orenshaw (U.S. EPA)
Bob Lewandowski (Navy BRAC PMO)
File: 0182

FORMER NAVAL AIR WARFARE CENTER (NAWC) WARMINSTER
MEETING MINUTES

RESTORATION ADVISORY BOARD (RAB) MEETING NO. 105
REFERENCE: CLEAN CTO NO. 041

1. Meeting Date and Time: November 1, 2006, 9:35 AM to 11:55 PM
2. Location: Warminster Municipal Authority Board Room
3. Attendees: See Attachment 1 (attendance list)
4. Summary of Meeting Discussions: See below.

Introduction and Administrative Update

Mr. Lonnie Monaco, 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 minutes from the previous meeting. Mr. Dave Fennimore (Earth Data) asked if a decision had been made yet regarding potentially switching the OU-4 remedy to natural attenuation. Mr. Monaco indicated that no decision had been made yet. Mr. Fennimore also asked about the statement in the minutes regarding the possible shutting down of extraction wells whose concentrations had flat-lined. Mr. Monaco suggested that the topic be revisited for clarification.

Optimization Study Status Update

Mr. Russ Sirabian (Battelle) provided an update of the status of Battelle's optimization study (see handout, Attachment 3). For Area A, the primary recommendation is to begin pumping extraction wells EW-A5 and EW-A9, which had been shut down to minimize potential redistribution of high levels of contamination (including DNAPL) in the vicinities of extraction wells EW-A6 and EW-A7. Mr. Fennimore asked about PCE concentrations in these wells. Based on the recent TEG memo distributed in regards to potentially pumping from the area of HN-69D, PCE concentrations in the extraction wells in question typically range from nondetect to several hundred ug/L. Mr. Tony Sauder (Pennoni Associates) asked about the proposed increase in the pumping rate of EW-A7 from 0.3 gpm to 1 gpm – Mr. Sirabian indicated that it could probably be achieved by changing the level switch depth settings. Mr. Sauder also asked for a summary report for O&M activities to

show the effects of the proposed system changes once they are implemented – Mr. Monaco affirmed that this would be provided. Mr. Jeff Orient (Tetra Tech NUS) asked why extraction well EW-A13 was recommended for shutdown since it has PCE at 93 ug/L (2006 data). Mr. Sirabian agreed that it should continue to be pumped in light of this. Mr. Monaco indicated that a revised draft report would be out shortly for review and comment.

For Area D, Mr. Sirabian indicated that all monitoring wells are below 10 ug/L of TCE and most extraction wells have flatlined in regards to contaminant trends over time. Battelle is recommending the shutdown of extraction wells EW-D1, EW-D4, and EW-D5 [Mr. Pat Schauble (ECOR) pointed out that EW-D5 was shut down in 2004 based on TEG recommendation and as per RAB agreement]. Mr. Sauder questioned some of the trend lines drawn, especially in light of the use of the trend lines as tools for making extraction well shutdown decisions. Ms. Kathy Davies (U.S. EPA) indicated that extraction wells should also have low levels of contamination along with an asymptotic concentration trend over time to be considered for shutdown.

For the groundwater treatment system, Battelle is recommending elimination of the metals removal pretreatment components (with the exception of keeping the ion exchange unit online), as the sand filter in particular is a problem in regards to limiting the treatment plant capacity. Ms April Flipse (PADEP) indicated that the discharge permit requirements should be considered prior to making any final decisions about what treatment processes can be eliminated.

For the LTM program, Mr. Sirabian indicated that Battelle is recommending the TEG recommendations be implemented with the exception of extraction well EW-A18. Since the pump and piping will be removed from this well, Battelle is recommending semiannual sampling for awhile, with a PDB sampling method employed. Other recommendations include sampling the Area A extraction wells quarterly for awhile after pumping rate modifications are made (including new extraction well EW-HN69D once it is installed and operating) and reducing the frequency of water level measurements in hydrogeologic unit A and C wells (in Areas A and D) to annual. Mr. Sauder asked if formal recommendations had ever been sent out by the TEG in regards to changing sampling frequency – he is concerned about the lower frequency of sampling in several offsite wells (HN-52S, HN-69, HN-67) in light of the recent increases in contaminant levels in some offsite wells (including WMA-26). Mr. Monaco indicated that the TEG will consider whether the sampling frequency should be changed in light of the new data and make a recommendation one way or the other.

Area C Source Assessment Status

Mr. Monaco established a due date of November 20, 2006 for review comments on the draft work plan. Mr. Chris Candela (ATC Associates, representing Erickson retirement Communities) asked if Erickson could comment on the work plan – Mr. Monaco indicated that comments were welcome. Some initial concerns expressed by Mr. Candela include the proximity of some of the proposed wells to nearby buildings, the high number of soil vapor points proposed to be drilled through a paved parking area, and potential damage to some large, high-value oak trees located in the area. Ms. Davies suggested that a "building floor subslab" approach be taken to the soil gas survey that would include a more limited number of holes hand-drilled through the pavement, which Mr. Candela indicated that he was in favor of. Bob Lewandowski (Navy BRAC PMO) assured Mr. Candela that the Navy is very sensitive to the fact that the units in the retirement village are now occupied and that, although the Navy has reserved the right to conduct necessary remedial activities, the Navy will work closely with Erickson to minimize the disturbance to the property and any inconvenience to the residents during the conduct of the investigation. Mr. Jim Burke (PADEP) asked about underground lines running across the parking lot area, as the sand/gravel bedding around them can be preferential conduits for vapor accumulation and migration. Mr. Candela is to provide as-built drawings of underground utilities in the area, as well as information regarding the nearby stormwater pond and the locations of the high-value trees. Mr. Sauder asked about a reference in Section 1.2 of the work plan about the nearest active well being within 500 feet of the base, as his impression was that all nearby wells had been closed by the Navy and public water provided to the residents. Mr. Orient indicated that he would check the statement for accuracy.

Act II – 905 Louis Drive

Mr. Monaco indicated that Mr. Mike Nines was not available today for an update regarding his firm's Phase II site assessment activities related to 905 Louis Drive. Mr. Dennis Orenshaw (U.S. EPA) provided an update of EPA efforts to identify potential sources for the increased levels of contamination recently found in groundwater in the Louis Drive/WMA 26 area. A project manager (Charlene Kramer) has been assigned to the project by EPA. Thirteen potential sites have been identified in the area, and the EPA is now in the process of attempting to narrow down the number of sites through additional data gathering. Funds are being set aside for an EPA investigation of the area. Mr. Sauder asked what the basis was for sites being identified, and Mr. Jim Krueger (Warminster Township) indicated that he had four specific sites of concern relative to potential contaminant releases. Mr. Monaco asked Mr. Orenshaw to provide a list of the 13 sites to the RAB and invite Ms. Kramer to the next RAB meeting.

Post-ROD Monitoring at OU-10

Mr. Monaco inquired about the status of reviews for the draft work plan for sediment sampling at OU-10 that was submitted on October 6. Ms. Davies indicated that the Region III BTAG needed to review the document and that she would forward her copy to the BTAG tomorrow. Mr. Sauder asked about the status of stream sampling in Area A – Ms. Flipse and Mr. Orient indicated that 8 rounds of sampling had been completed and no further sampling was required or needed. Mr. Monaco established a due date of November 29 for work plan review comments and Mr. Orenshaw indicated that he would push BTAG to provide comments by then.

Update on Status of Wells 13 and 26

Mr. Monaco indicated that the stripper upgrade for Well 26 and addition of a stripper to Well 13 that were proposed by Mr. Tim Hagy in the last technical meeting are considered by the Navy as part of future response costs and will be reimbursed as appropriate, thus WMA can proceed with the modifications. Mr. Dave Fennimore (Earth Data) indicated that he had not yet determined whether Well 26 had been sampled for 1,4-dioxane but would prioritize this action item and would provide the information to the Navy. Mr. Schauble indicated that monitoring wells had not yet been sampled for 1,4-dioxane as PDBs are not appropriate for this contaminant. He proposed a three-volume purge or low-flow sampling technique for the wells targeted for 1,4-dioxane sampling – Ms. Davies indicated a preference for the conventional purge approach versus low-flow purging/sampling. Mr. Schaulbe stated that the treatment plant influent and effluent had been sampled for 1,4 dioxane with no detections at a detection limit of 3.5 ug/L, and briefly described available treatment technologies for this contaminant (see handout, Attachment 4).

Second Five Year Review Report Status

Mr. Orient indicated that Tetra Tech NUS is in the process of providing responses to comments to the U.S. EPA comments received on the draft report, in addition to the Pennoni comments received and responses provided at an earlier date. No additional comments were offered by the RAB participants.

Extraction Well Near HN-69D

Mr. Orient summarized the TEG evaluation and recommendations provided to the RAB via email on October 26. In summary, the TEG recommends installing and operating an extraction well

adjacent to HN-69D. Ms. Davies suggested the installation of transducers in nearby wells during drilling operations to identify hydraulic interconnections among the wells. Mr. Monaco asked for any comments on the evaluation – no one voiced any objections or concerns. Mr. Sauder asked whether a timeframe had been established for this work – Mr. Monaco indicated that the work was not yet funded, but may be a spring 2007 activity.

Miscellaneous Topics and Issues

Mr. Schauble asked if anyone was aware of where the treatment plant outfall into the receiving stream is located, as this information is needed for a NPDES permit that he is working on. No one was aware of the location other than it is some distance to the north and follows the railroad tracks at least part way from the treatment plant.

Action Items

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

- The TEG is to provide recommendations for any adjustments to the LTM program sampling frequency that they feel is appropriate.
- Mr. Candela is to provide as-built drawings for utilities relative to where Area C source assessment work is under consideration.
- Mr. Orenshaw is to provide a list of the 13 sites EPA is investigating in the Louis Drive area.
- Mr. Nines is to provide sampling results and water level data for his investigation of 905 Louis Drive.
- Mr. Fennimore is to research and provide any 1,4-dioxane results for Well 26.
- Mr. Orient is to recommend wells for transducer monitoring during the drilling of the extraction well near HN-69D.

Next Meeting Date

The next RAB meeting date was set for February 7, 2007 at 9:30 AM in the WMA Board Room.

The meeting was adjourned at approximately 11:55 AM.

ATTACHMENT 1
ATTENDANCE LIST

NAWC Warminster RAB Mtg
Nov. 1, 2006

Name	Affiliation	Phone	E-Mail
Jeff Orient	Tetra Tech NUS	412/921-8778	Jeff.Orient@ttnus.com
Ron Sloto	US Geological Survey	610-431-2434x212	rasloto@usgs.gov
LONNIE MONACO	US NAVY	(215)897-4911	orlando.monaco@navy.mil
Kathy Davies	US EPA	215-814-3315	davies.kathy@epa.gov
Matt Lapp	ECOR Solutions, Inc.	610-431-8731	lapp@ecor-solutions.com
Amanda Bell	ECOR Solutions	610-431-8731 (117)	bell@ecor-solutions.com
Patrick Schauble	ECOR Solutions	610-431-8731 (108)	schauble@ecor-solutions.com
NORM KELLY	RAB (CO-CHAIR)	(215-675-1157)	N-A
DENNIS ORENSHAW	US EPA	215-814-3361	ORENSHAW.DENNIS@EPA.GOV
Bob Lewandowski	NAVY BRAC PMO.	(215) 897-4908	robert.f.lewandowski@navy.mil
Chris Candela	ATC/Erickson	610 313 3100, 495	christopher.candela@atcassociates.com
Tim Hagey	WMA	215 675 3301x202	timh@warminsterauthority.com
Dave Fennimore	EDN	610 524-9466	dfennimore@earthdatane.com
Tony Sauder	Warminster Twp / Pennoni	215-322-3000	tsauder@pennoni.com
April Flipse	PADEP	484-250-5721	aflipse@state.pa.us
JIM BURKE	PADEP-ECP	484 250 5779	jaburke@state.pa.us
Jim Krueger	Warm Twp	215 443 5423	ashes@WarminsTERtownship.ORG

ATTACHMENT 2
MEETING AGENDA

NAWC WARMINSTER
TECHNICAL SUBCOMMITTEE/RAB MEETING

01 November 2006 9:30 AM
WMA Board Room
415 Gibson Ave
Warminster, PA

MEETING AGENDA

Administrative Update
Minutes of the Last Meeting

Area C Source Assessment
- Status of comments on Sept 06 Draft

Post-ROD monitoring at OU-10
- Status on draft review

Update on Status of Wells #13 and #26

1,4 Dioxane
- Sampling status at HN-16S, HN-52S, G/W treatment plant influent/effluent

2nd 5-Year Review
- Status on response to comments

Act II – 905 Louis Drive
- Status Update from property owner
- EPA Update on Offsite Preliminary Assessment

Extraction Well near 69D
- TEG update

Optimization Study Status
- Update from Battelle

Miscellaneous Topics and Issues – Action Items

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

ATTACHMENT 3
BATTELLE UPDATE

Battelle

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Optimization Study
NAWC Warminster, Pennsylvania

November 1, 2006

Overview of Recommendations

- Area A
  - Optimize pumping rates
  - Install new EW near HN-69D
  - Evaluate alternatives for source area treatment
- Area C
  - Continue additional investigation
- Area D
  - Discontinue pumping in select wells
  - Reduce pumping rates
- GWETS
  - Simplify system operation
- Long Term Monitoring
  - Revise monitoring frequencies

Area A – New Pumping Rates

Extraction Well	Max 1999 TCE Sampling Result (ppb)	Max 2006 TCE Sampling Result (ppb)	1999 TEG Recommended Pumping Rates	Avg 2006 Pumping Rate	New Recommended Avg. Pumping Rates
EW-A1	1,100	35	6	6.3	6
EW-A2	2,300	99	10	5.0	5
EW-A3	6,800	160	8	6.3	5
EW-A4	39,000	1,400	3	4.3	7
EW-A5	27,000	5,800	0	0.0	3
EW-A6	240,000	17,000	1	2.6	3
EW-A7	280,000	14,000	1	0.3	1
EW-A8	810	50	8	3.9	4
EW-A9	110,000	12,000	0	0.0	1
EW-A10	72,000	2,600	5	3.2	3
EW-A11	62	16	10	7.0	5
EW-A12	2,600	400	8	5.1	5
EW-A13	42	14	2	2.9	0
EW-A15	13	2.7	3	1.8	0
		TOTAL	65	48.7	48

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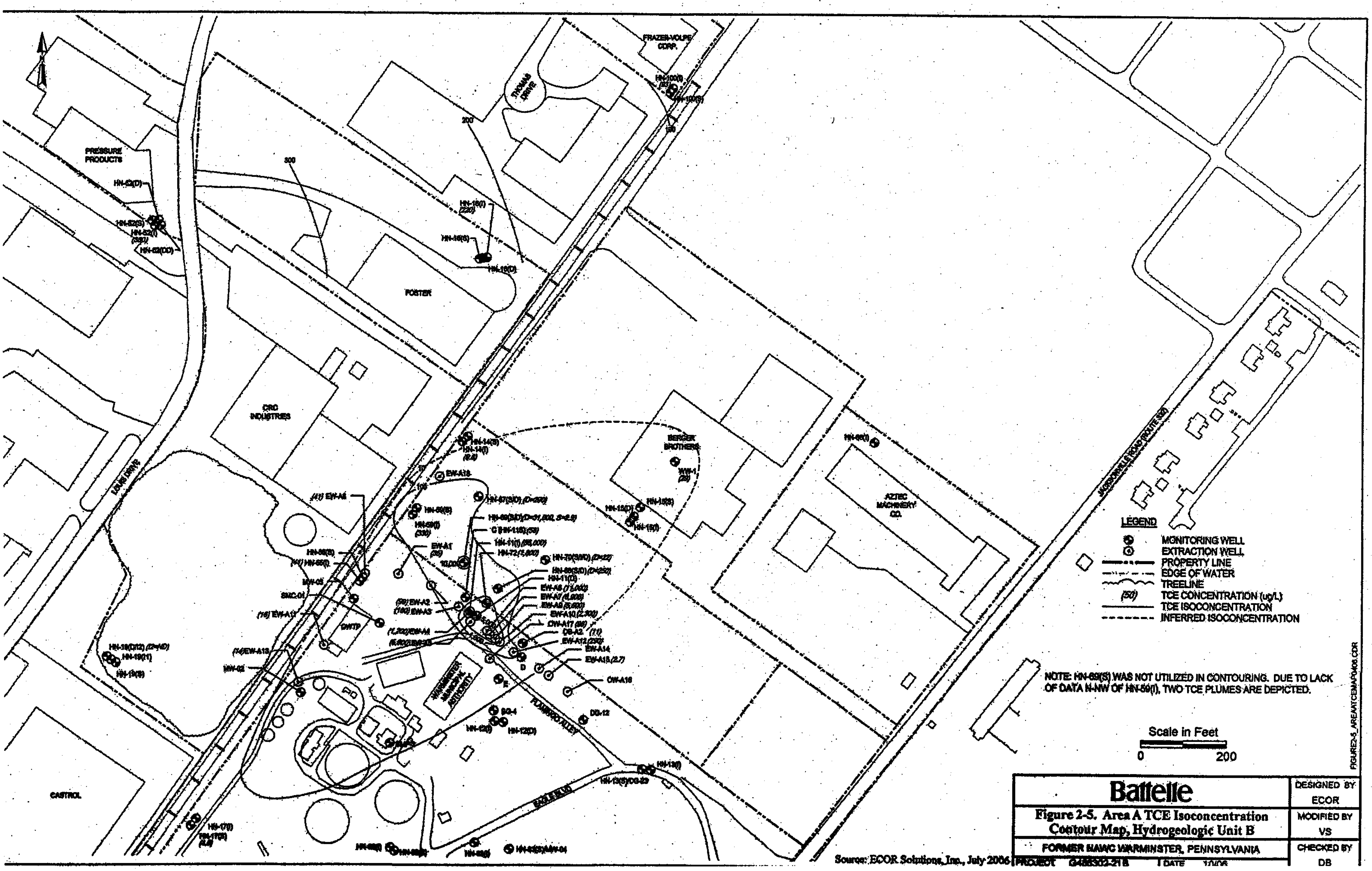
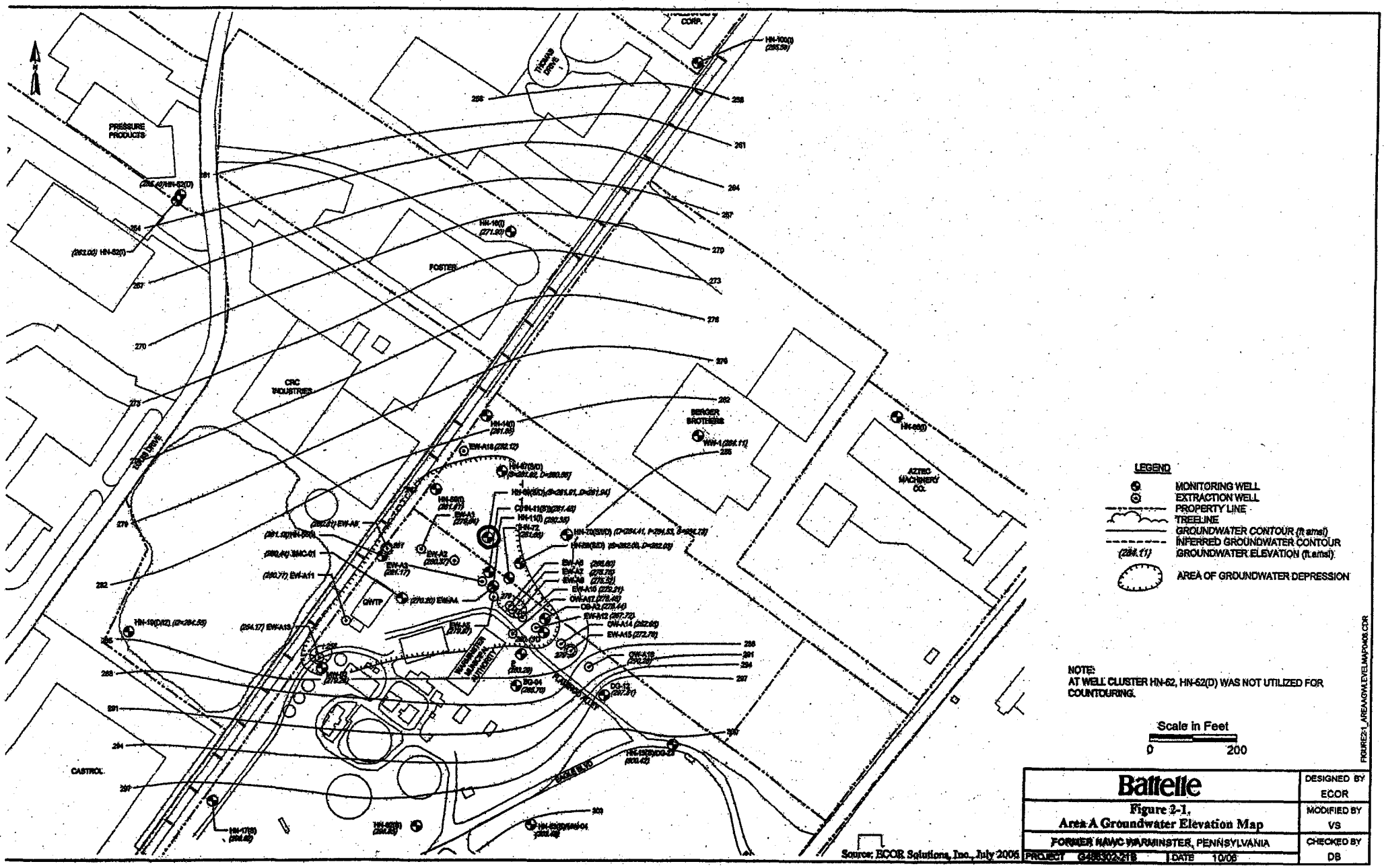


Figure 2-5. Area A TCE Isoconcentration Contour Map, Hydrogeologic Unit B

Source: ECOR Solutions, Inc., July 2006



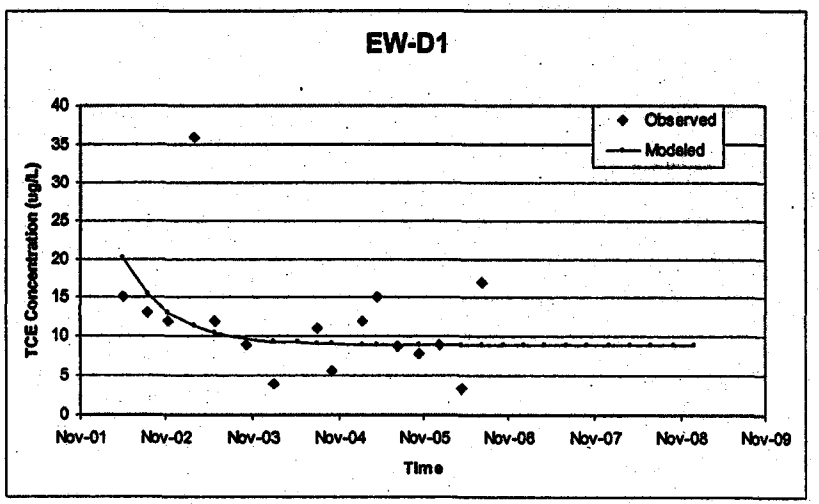
Source: ECOR Solutions, Inc., July 2006

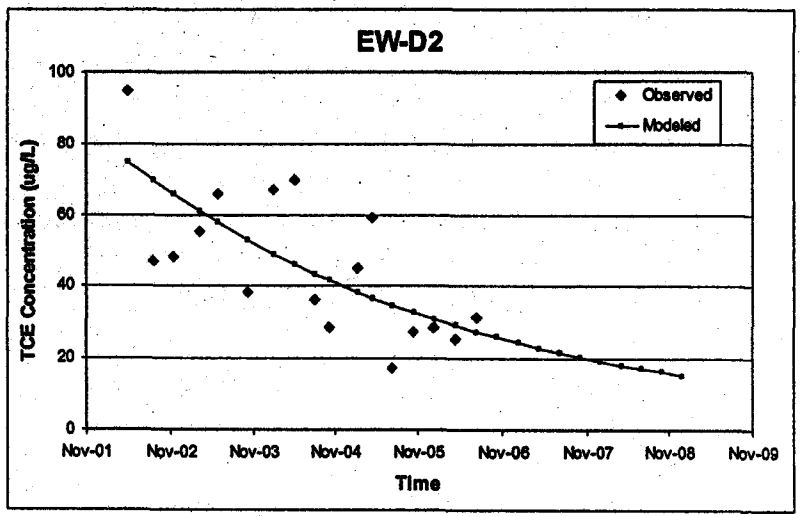
Battelle	DESIGNED BY ECOR
Figure 2-1. Area A Groundwater Elevation Map	MODIFIED BY VS
FORMER NAVC WARMINSTER, PENNSYLVANIA	CHECKED BY DB
PROJECT G486302-218 DATE 10/06	

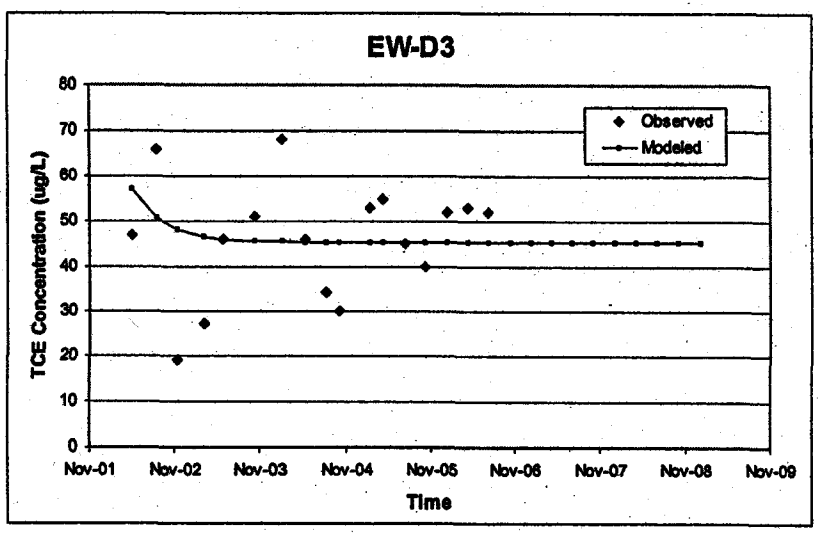
Area D – Statistical Analysis

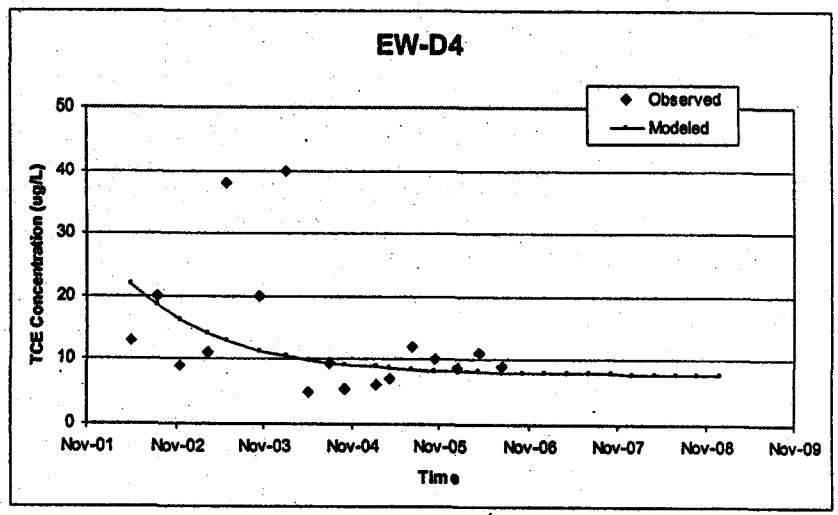
- Statistical analysis shows no increasing trends at extraction wells
- All monitoring wells have TCE <10 μg/L
- Asymptotic conditions achieved in all wells except EW-D2

Area D – Statistical Analysis









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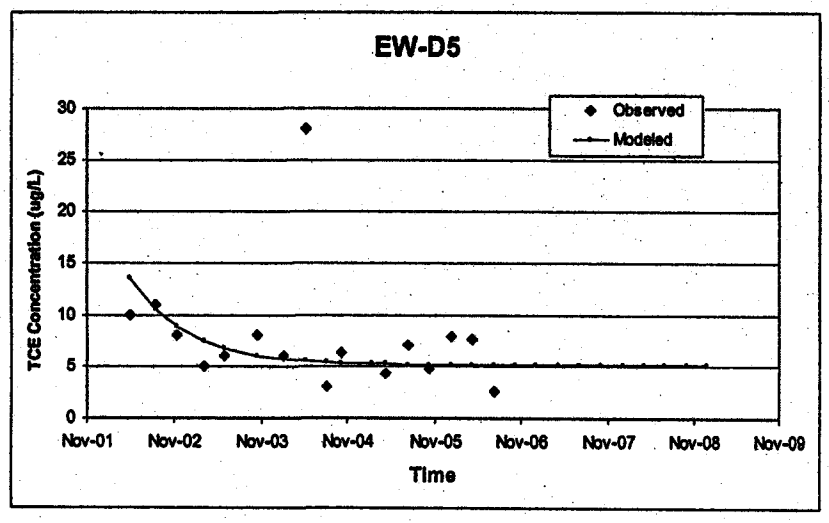
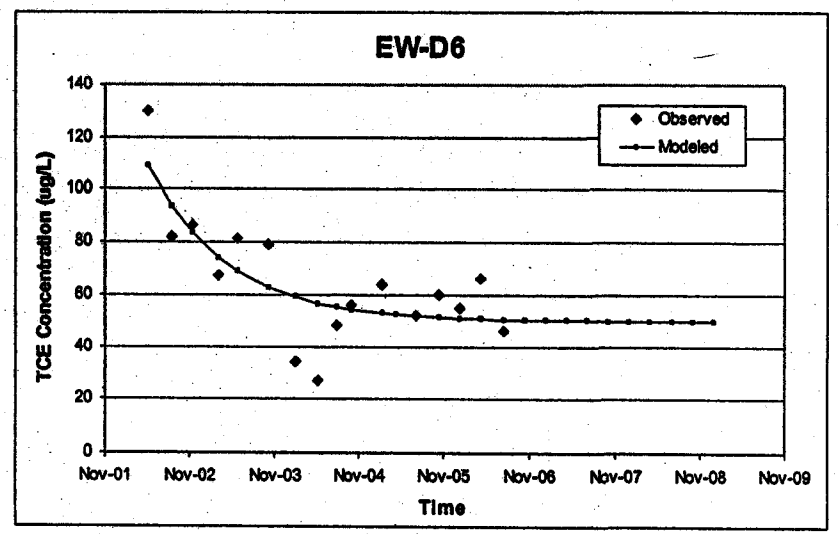
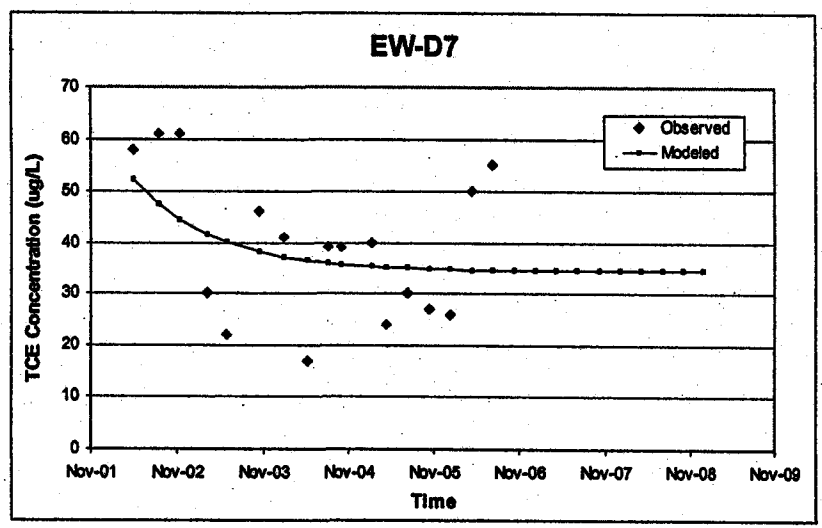
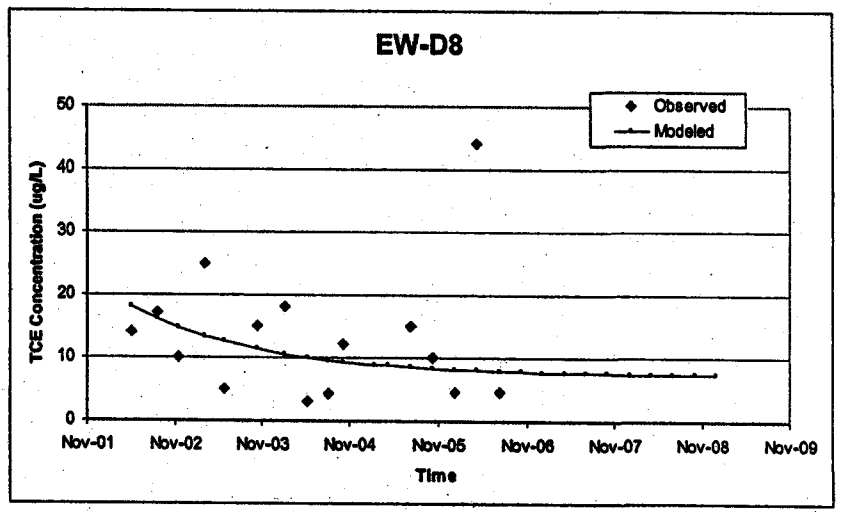
Area D – Statistical Analysis









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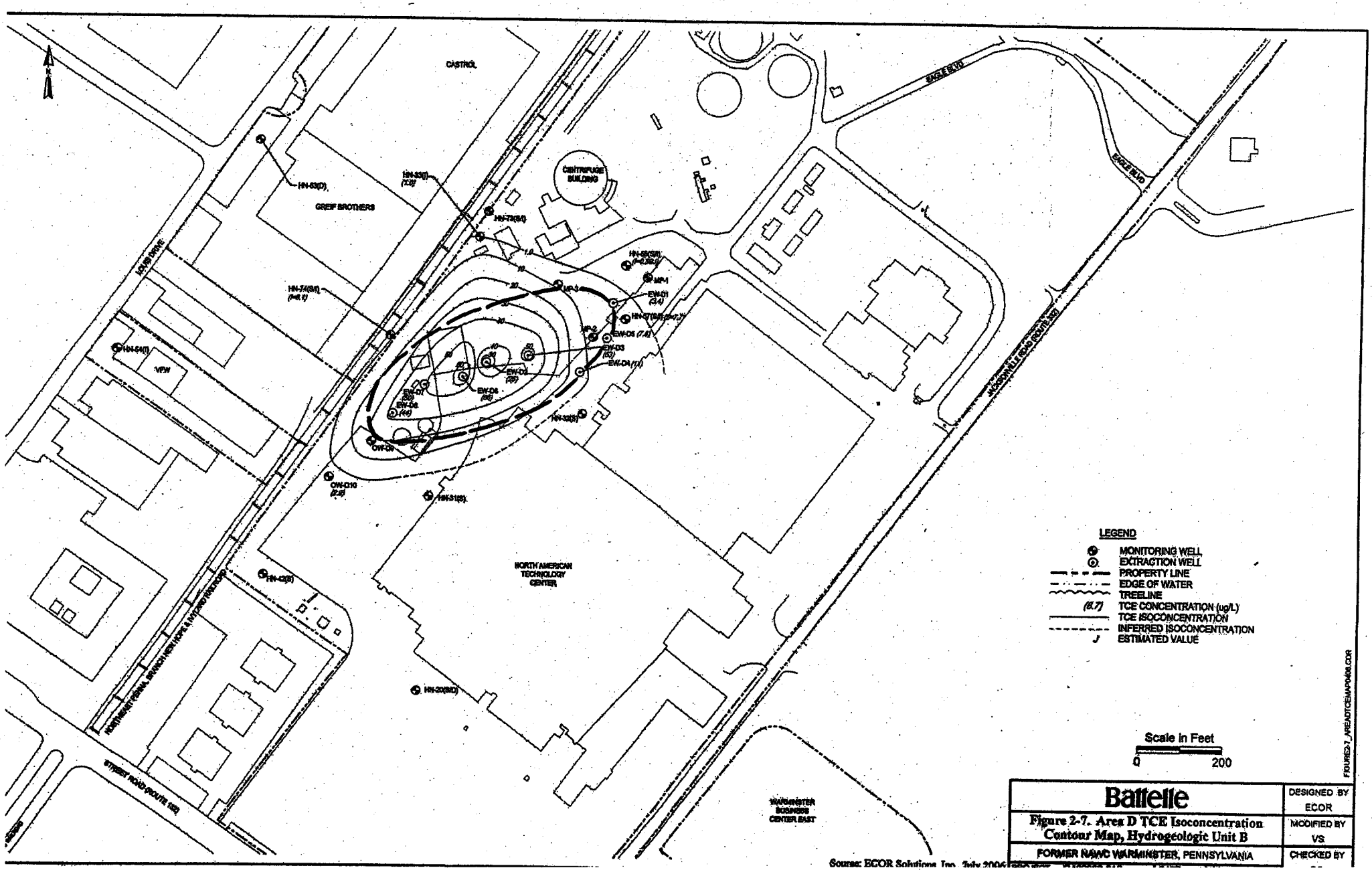


Source: ECOR Solutions Inc. July 2006

Battelle	DESIGNED BY ECOR
Figure 2-7. Area D TCE Isoconcentration Contour Map, Hydrogeologic Unit B	MODIFIED BY VS
FORMER NAWC WARMINSTER, PENNSYLVANIA	CHECKED BY

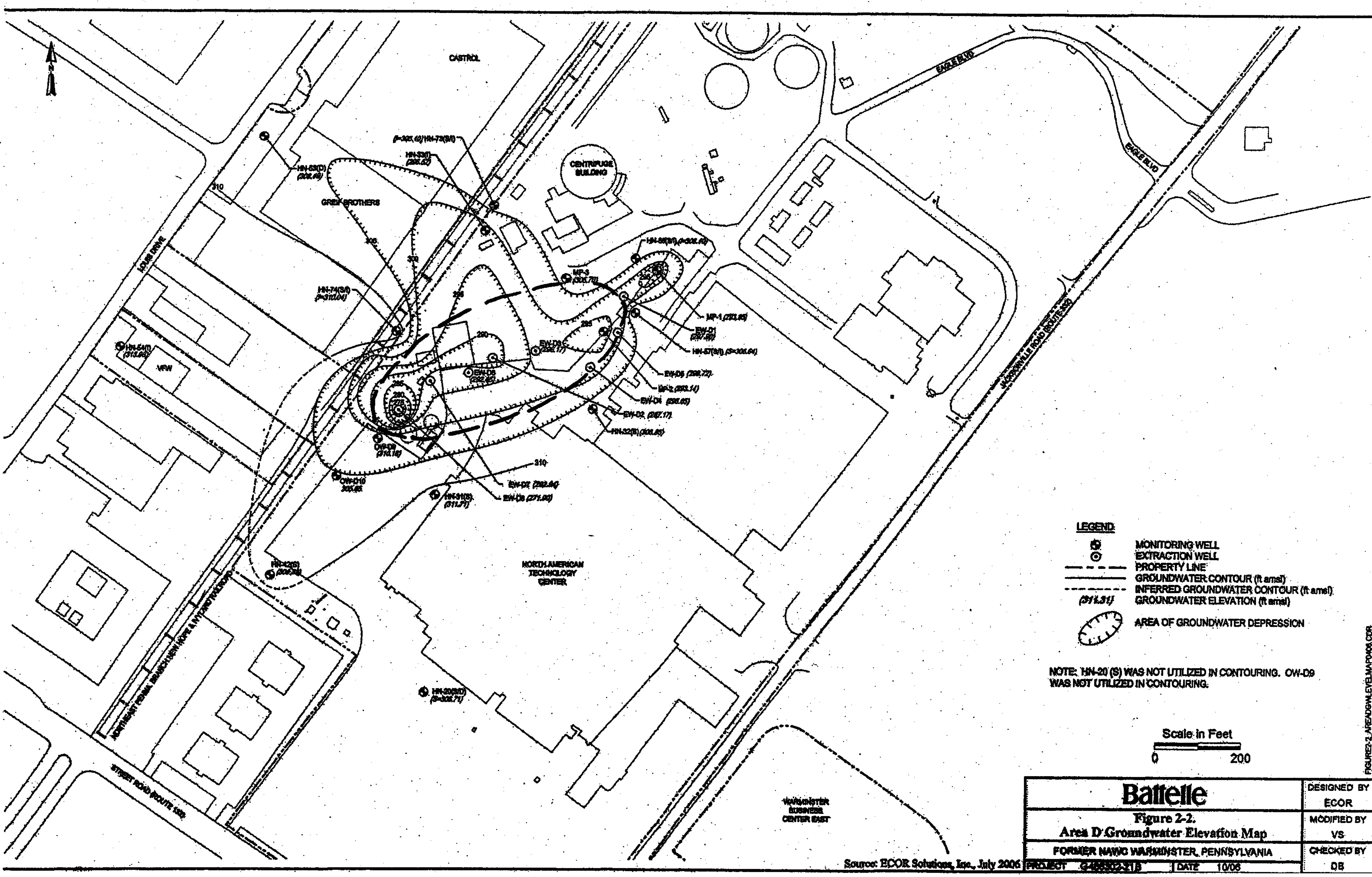


Figure 2-2.
Area D Groundwater Elevation Map

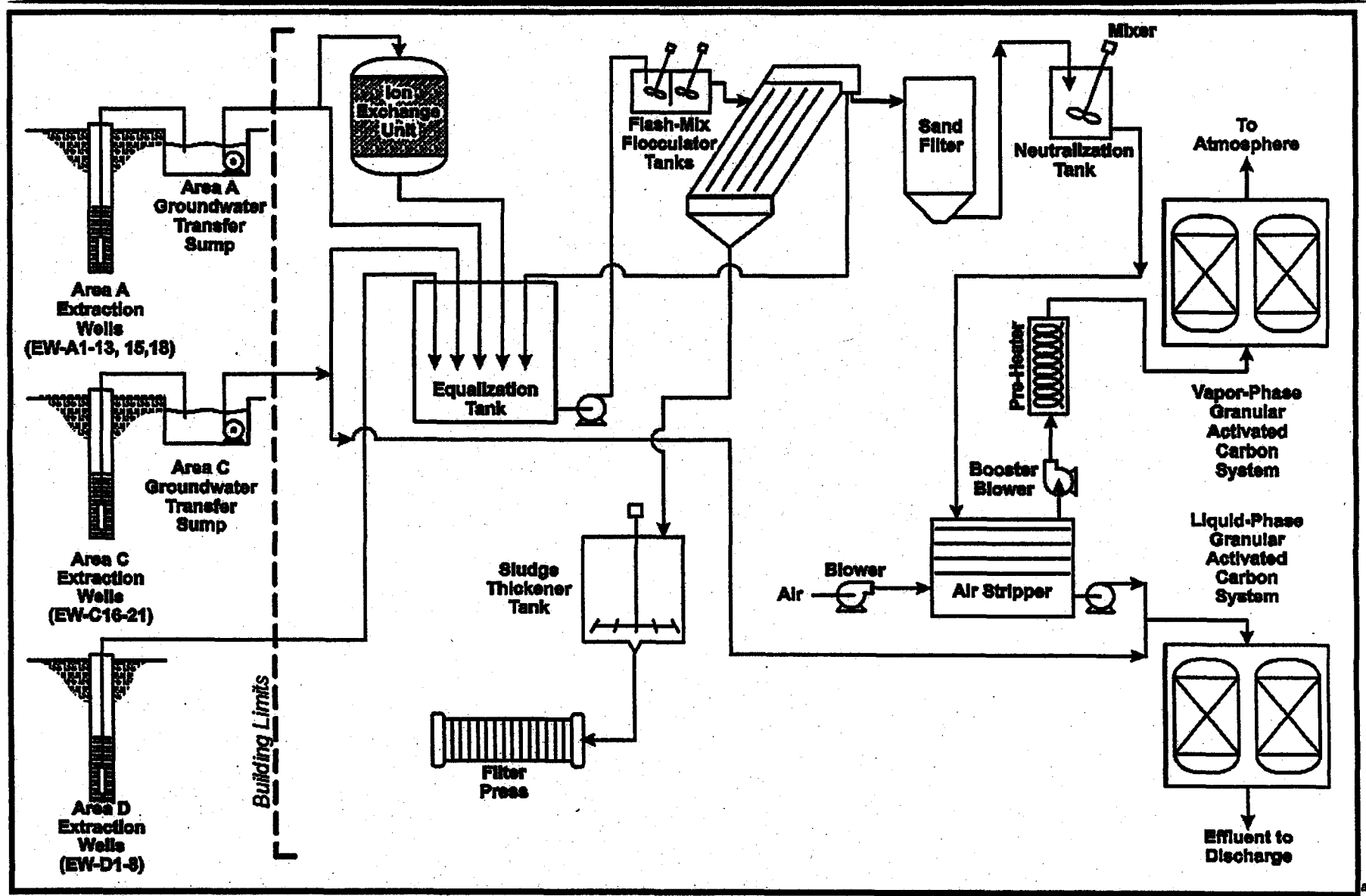
Area D – Extraction Rate Reduction

- Current extraction network provides containment for all extraction and nearby monitoring wells – area is larger than necessary
- Eliminate pumping in EW-D1, EW-D4, and EW-D5
  - EW-D1, EW-D4, and EW-D5 are furthest from source and have lowest concentrations
  - Extraction in remaining wells will provide containment of target area
- Incrementally reduce extraction rates in remaining extraction wells
  - Continue quarterly monitoring to evaluate reduction to ensure target area is contained

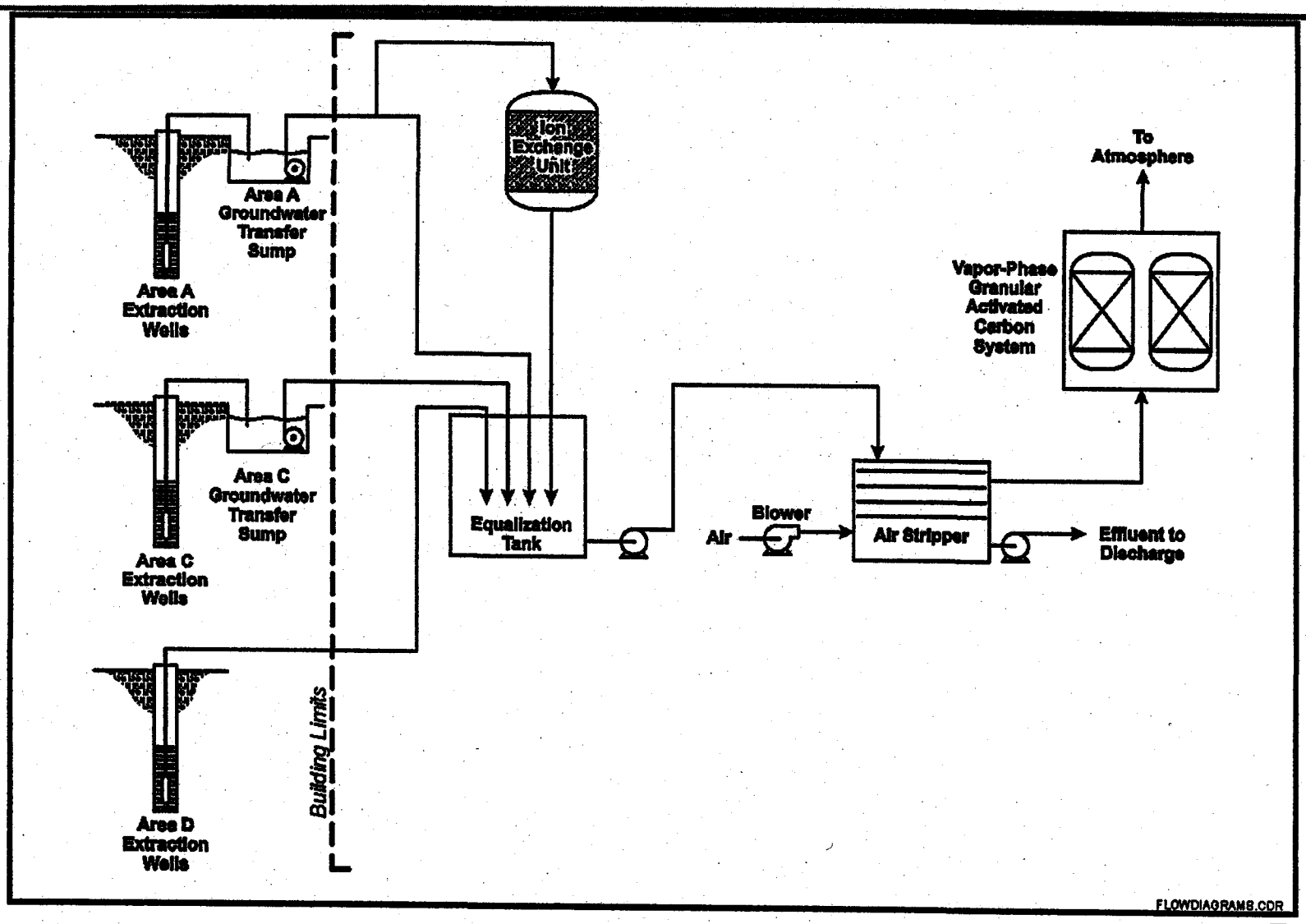
GWETS Optimization Recommendations

- Upgrade computer software to allow for better remote access and easier data processing.
- Reprogram EQ tank controls to allow for proper operation of the VFD pumps.
- Take metals removal equipment off-line.
- Monitor ion exchange units directly on a monthly basis to determine if resin change out is necessary.
- Install AS with higher VOC removal efficiency
- Discontinue use of LGAC if monitoring data indicate that new AS can consistently achieve permit limits
- Install additional VGAC unit to operate in series with the two existing units

Current Treatment System



Optimized Treatment System



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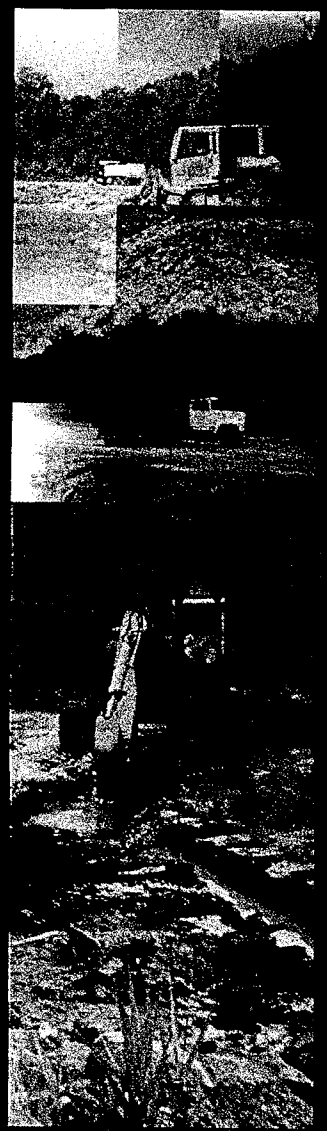
LTM Optimization Recommendations

- Implement TEG recommendations, except continue semi-annual sampling of EW-A18 as a monitoring well
- Retain quarterly sampling in extraction wells to monitor proposed pumping rate modifications
  - Include additional monitoring wells if necessary depending on pumping strategy
- After one year of continued monitoring with modified pumping rates, reduce groundwater-level monitoring to annual in hydrogeologic units A and C (Areas A and D)
- Increase monitoring frequency in new EW HN-69D to quarterly for one year after pumping begins; semiannual monitoring thereafter

ATTACHMENT 4
ECOR UPDATE



ECOR Solutions, Inc.

Restoration Advisory Board Meeting for NAWC Warminster

November 1, 2006

Delivering environmental construction, operations and remediation solutions to industry and government

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Topics for Discussion

- **Administrative Update**
- **Area C Source Assessment (Tetra tech NUS)**
- **Update on Status of WMA Wells #13 and #26 (WMA/Navy)**
- **1,4-Dioxane Discussion (ECOR)**
- **2nd 5-Year Review**
- **ACT II at 905 Louis Drive**
- **Extraction Well Near MW-69D**
- **Optimization Study**
- **Miscellaneous Topics, Issues, and Discussion**

1,4-Dioxane Results

The GWTP was sampled for 1,4-dioxane on 18 October 2006 (Method 8570).

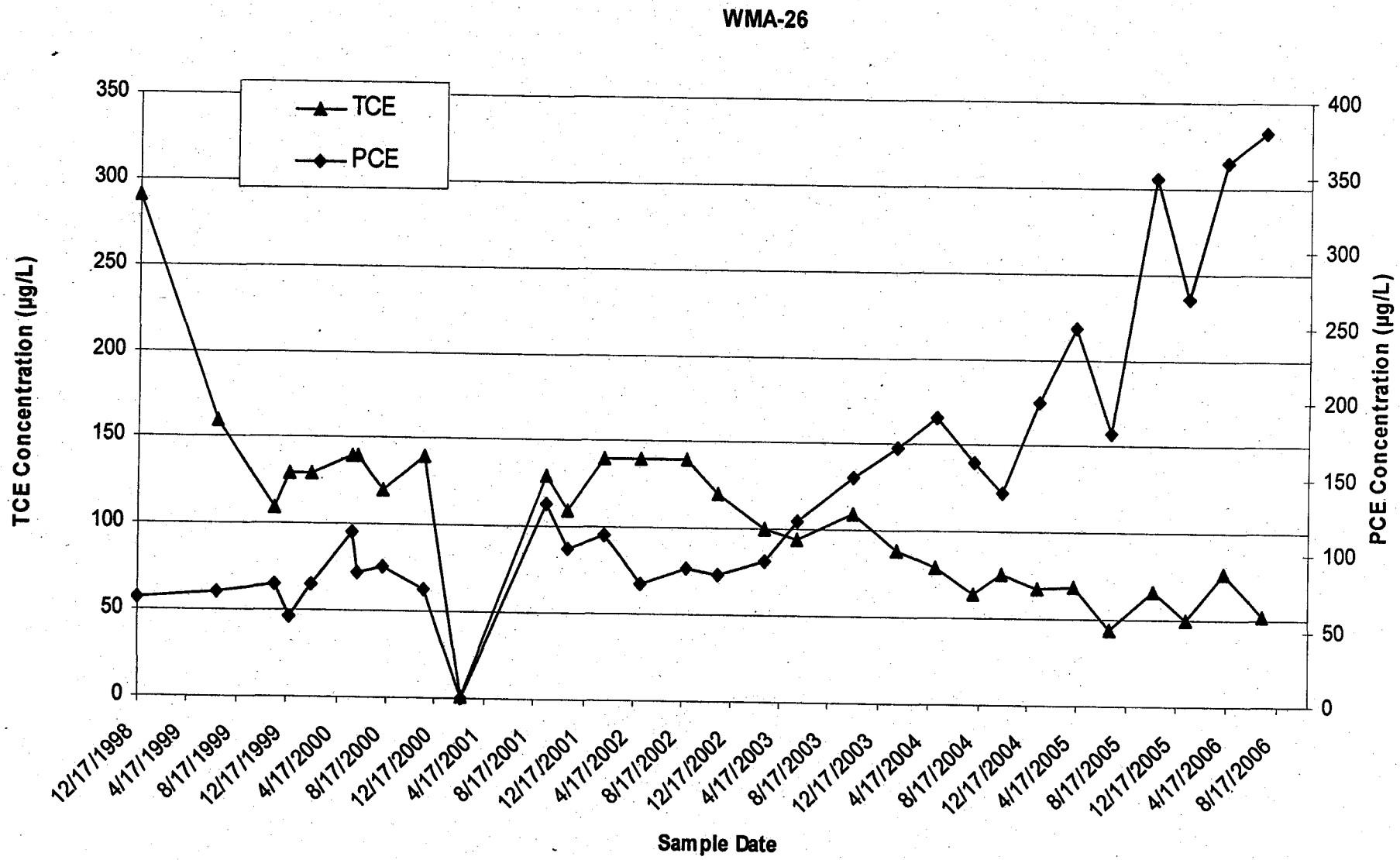
- Influent and effluent results were ND with Reporting Limits of 9.4 µg/L and 9.5 µg/L respectively.
- The laboratory was asked to report "J" values down to the Method Detection Limit of 3.5 µg/L.

Monitoring wells HN-52S, HN-16S, and WMA-26 were proposed for 1,4-dioxane sampling during the October 2006 monitoring event.

- HN-52S and HN-16S are sampled on an annual basis and are not scheduled for sampling until April 2007.
- These wells are sampled using PDBs samplers which may not be appropriate for 1,4-dioxane sampling.
- Recommend sampling for 1,4-dioxane (Method 8270) and VOCs (Method 8260) via conventional purge method per LTPMP in November 06.
- WMA-26 may have already been sampled for 1,4-dioxane and can be resampled as needed.

1,4-Dioxane Treatment Technologies

- Treatment technologies currently used at the GWTP (air stripping and carbon adsorption) are not effective for removing 1,4-dioxane.
- The most common technologies for 1,4-dioxane destruction in groundwater are advanced oxidation processes (AOP).
- This typically involves adding hydrogen peroxide to the water in the presence of ultraviolet (UV) light. pH may be lowered before the reactor vessel to enhance destruction.
- One variation, known as HiPOx, utilizes pressurized injection of peroxide and ozone into a reaction chamber where it is mixed with the influent.
- TCE and PCE are also destroyed by this technology.



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