Fort Detrick
Area B – Groundwater “Snapshot” Work Plan Results

Fort Detrick Restoration Advisory Board Meeting
February 23, 2011
Fort Detrick, Maryland

History/Status

- The Area B Groundwater RI Work Plan was issued as Final in July 2010
- Prior to implementation of the Groundwater RI Work Plan, the Army conducted a “snapshot” sampling event in Area B to include a large number of wells and additional chemical parameters
- This sampling effort and analysis follows the Groundwater RI Work Plan outline
- Semi-annual monitoring of the Building 568 TCE Spill has been conducted since 2002

Status Update Discussion

- Area A – Building 568 TCE Spill Site
  - Recent Long-Term Monitoring Results
- Area B Groundwater
  - Results of Area B Groundwater “Snapshot” Sampling

Area A

Building 568 TCE Spill Site

Area A – Building 568 TCE Spill Site

- Selected remedy was “Plume Containment using Groundwater Extraction and Monitoring,” which included:
  - Continue operation of the existing groundwater extraction system in Building 568
  - Long-term monitoring of groundwater every six months since 2002

Building 568 TCE Concentrations Recent Sampling

TCE in groundwater at Building 568 slightly above the 5 µg/L MCL

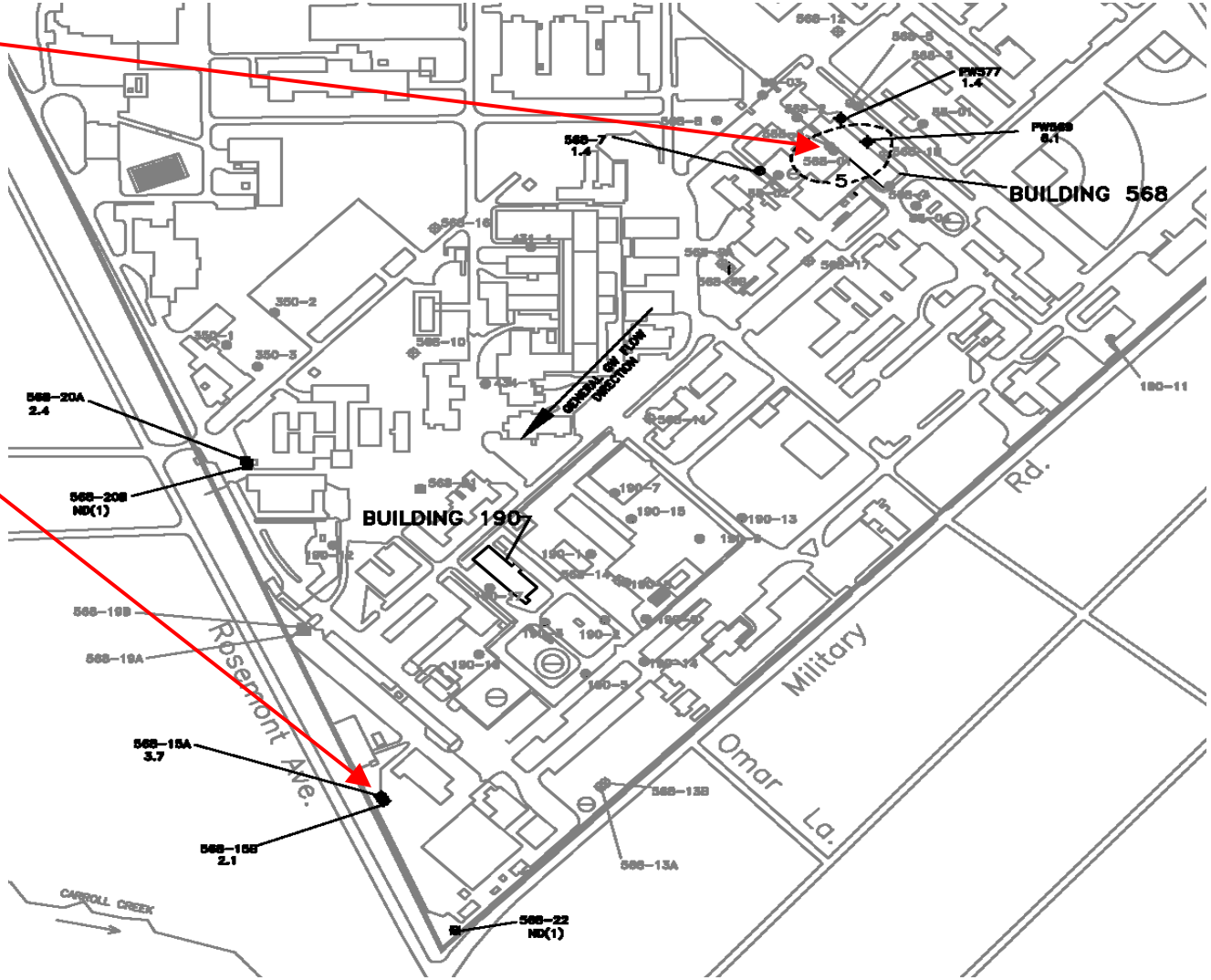
PW 569
Mar 09 – 6.1 µg/L
Mar 10 – 7.9 µg/L
Sep 10 – 6.4 µg/L

PW 577
Mar 09 – 1.4 µg/L
Mar 10 – 2.3 µg/L
Sep 10 – 1.5 µg/L

TCE in 568-15A has been near the 5 µg/L MCL over the past few years

Mar 08 – 5.7 to µg/L
Sep 08 – 2.9 µg/L
Mar 09 – 3.7 µg/L
Sep 09 – 6.0 µg/L
Mar 10 – 7.3 µg/L

PCE has also been detected in 568-15A (0.75-1.8 µg/L), possibly indicating a different source



Area A
Building 568 Path Forward

- Once source area TCE concentrations are consistently below the federal Maximum Contaminant Level (MCL) (5 µg/L), Army will close site with MDE concurrence
- Well 568-15A will be investigated as part of the Area B groundwater remedial investigation (dye trace study) to determine the source of contamination in this well

Area B

Groundwater “Snapshot”

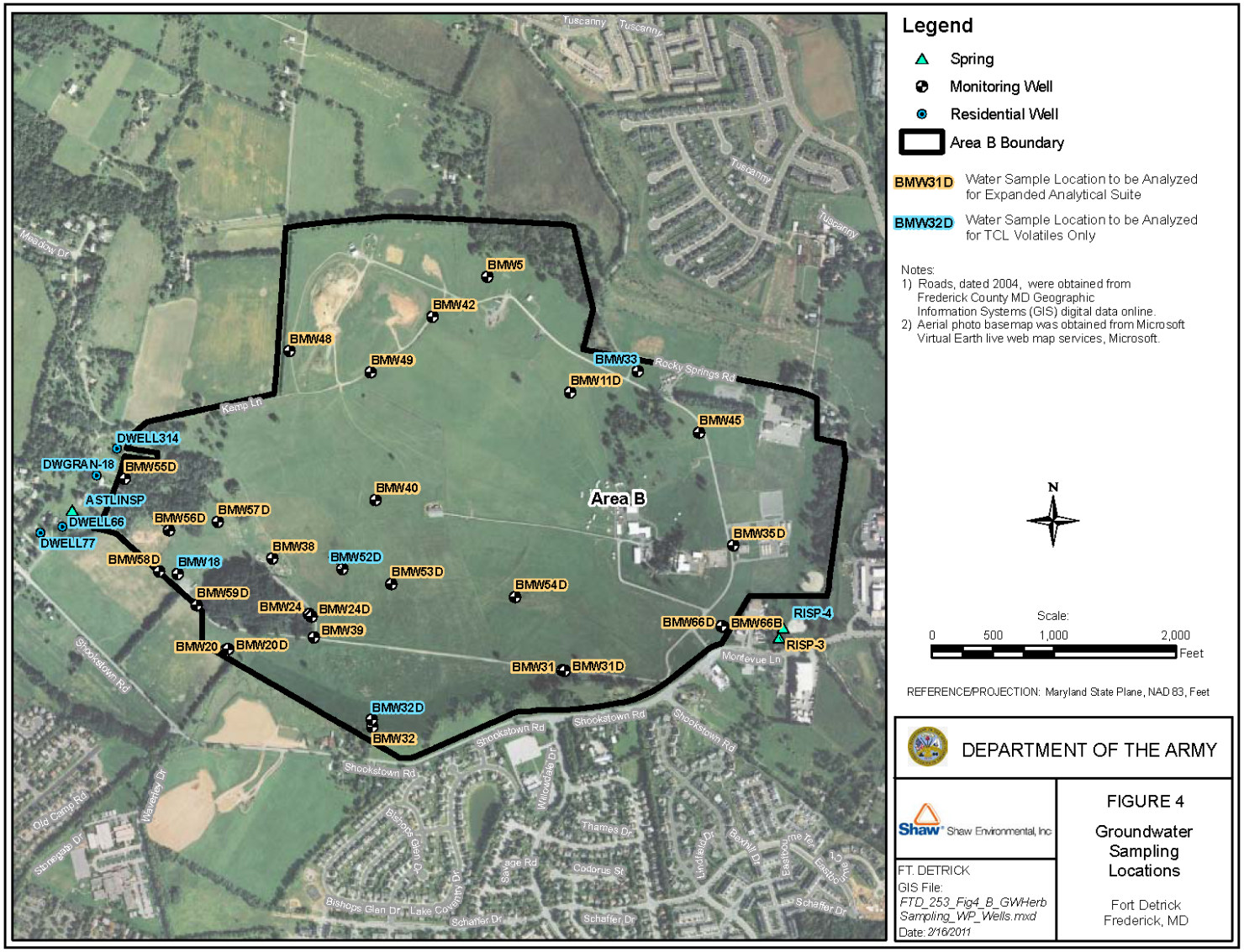
Area B Groundwater "Snapshot" Activities

- Sampling event was designed to give the Army a current snapshot of the conditions and concentrations of Area B monitoring wells and select residential wells surrounding Area B
- Collection and analysis of sample parameters, not previously analyzed, were added to the sampling plan to give a more complete characterization of groundwater
- Sampling performed during September 2010 and included 30 Area B monitoring wells, three residential springs, and four residential wells
- Samples were analyzed based on the location's proximity to source areas for either:
  - Target Compound List (TCL) VOCs only
  - "Expanded" Suite
  - Bis(2-chloroethyl)ether (BCEE) and 1,4-dioxane (low level analysis)
- Samples were analyzed at an off-site laboratory by Test America, Inc. in Savannah, Georgia

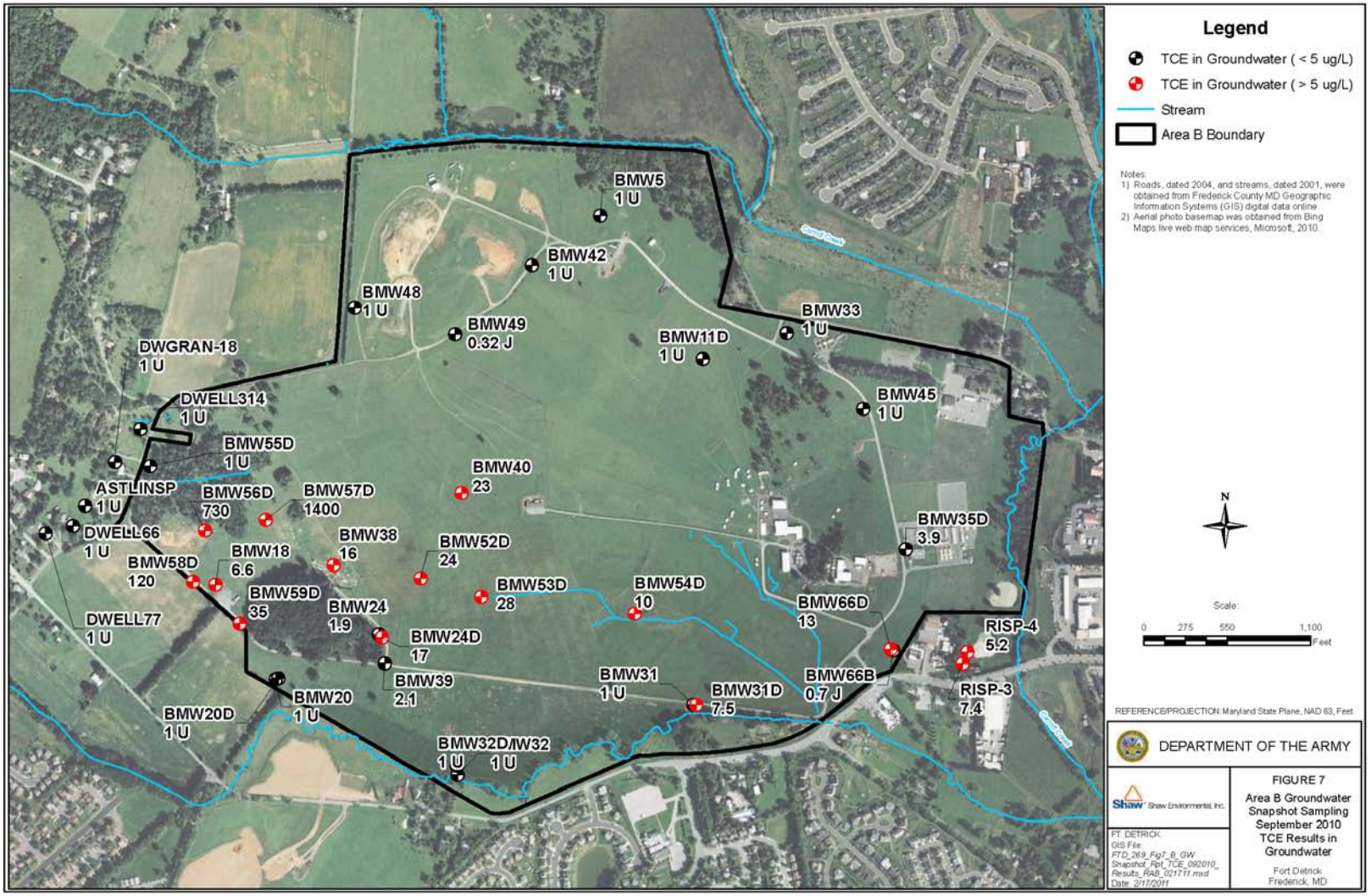
Area B Groundwater "Snapshot" Sampling

	DQO / Data Type	Full Validation?	20 TICs (EPA 8260B)	TCL VOCs + 20 TICs (EPA 8270C)	TCL SVOCs + BCEE + 1,4-dioxane (EPA 8270C SIM) (Lower detection limit)	TCL Pesticides/PCBs (EPA 8081A/8082)	(EPA 6010B/7470A) TAL Metals	Herbicides + Picloram (EPA 8151A)	(EPA 8260B) Freons	1,2,3-TCP (EPA 8260B)
Monitoring Wells (Groundwater Evaluation Sampling Snapshot Program)										
BMW5	Definitive	Yes	1	1	0	1	1	1	1	1
BMW11D	Definitive	Yes	1	1	0	1	1	1	1	1
BMW18	Definitive	Yes	1	0	0	0	0	0	1	1
BMW20	Definitive	Yes	1	1	0	1	1	1	1	1
BMW20D	Definitive	Yes	1	1	0	1	1	1	1	1
BMW24	Definitive	Yes	1	1	0	1	1	1	1	1
BMW24D	Definitive	Yes	1	1	0	1	1	1	1	1
BMW31	Definitive	Yes	1	1	0	1	1	1	1	1
BMW31D	Definitive	Yes	1	1	0	1	1	1	1	1
BMW32	Definitive	Yes	1	1	0	1	1	1	1	1
BMW32D	Definitive	Yes	1	0	0	0	0	0	1	1
BMW33	Definitive	Yes	1	0	0	0	0	0	1	1
BMW35D	Definitive	Yes	1	1	0	1	1	1	1	1
BMW38	Definitive	Yes	1	1	0	1	1	1	1	1
BMW39	Definitive	Yes	1	1	0	1	1	1	1	1
BMW40	Definitive	Yes	1	1	0	1	1	1	1	1
BMW42	Definitive	Yes	1	1	0	1	1	1	1	1
BMW45	Definitive	Yes	1	1	0	1	1	1	1	1
BMW48	Definitive	Yes	1	1	0	1	1	1	1	1
BMW49	Definitive	Yes	1	1	0	1	1	1	1	1
BMW52D	Definitive	Yes	1	0	0	0	0	0	1	1
BMW53D	Definitive	Yes	1	1	0	1	1	1	1	1
BMW54D	Definitive	Yes	1	1	0	1	1	1	1	1
BMW55D	Definitive	Yes	1	1	0	1	1	1	1	1
BMW56D	Definitive	Yes	1	1	0	1	1	1	1	1
BMW57D	Definitive	Yes	1	1	0	1	1	1	1	1
BMW58D	Definitive	Yes	1	1	0	1	1	1	1	1
BMW59D	Definitive	Yes	1	1	0	1	1	1	1	1
BMW66B	Definitive	Yes	1	1	0	1	1	1	1	1
BMW66D	Definitive	Yes	1	1	0	1	1	1	1	1
Residential Springs (Groundwater Evaluation Sampling Snapshot Program)										
RISP-3 (Robinson Box Sp)	Definitive	Yes	1	1	1	1	1	1	1	1
RISP-4 (Robinson Rock Sp)	Definitive	Yes	1	0	0	0	0	0	1	1
ASTLINSP	Definitive	Yes	1	0	0	0	0	0	1	1
Residential Wells (Groundwater Evaluation Sampling Snapshot Program)										
DWGRAN-18	Definitive	Yes	1	0	1	0	0	0	1	1
DWELL-66	Definitive	Yes	1	0	1	0	0	0	1	1
DWELL-77	Definitive	Yes	1	0	1	0	0	0	1	1
DWELL314	Definitive	Yes	1	0	1	0	0	0	1	1
		Totals:	37	27	5	27	27	27	37	37

September 2010 Sampling Locations



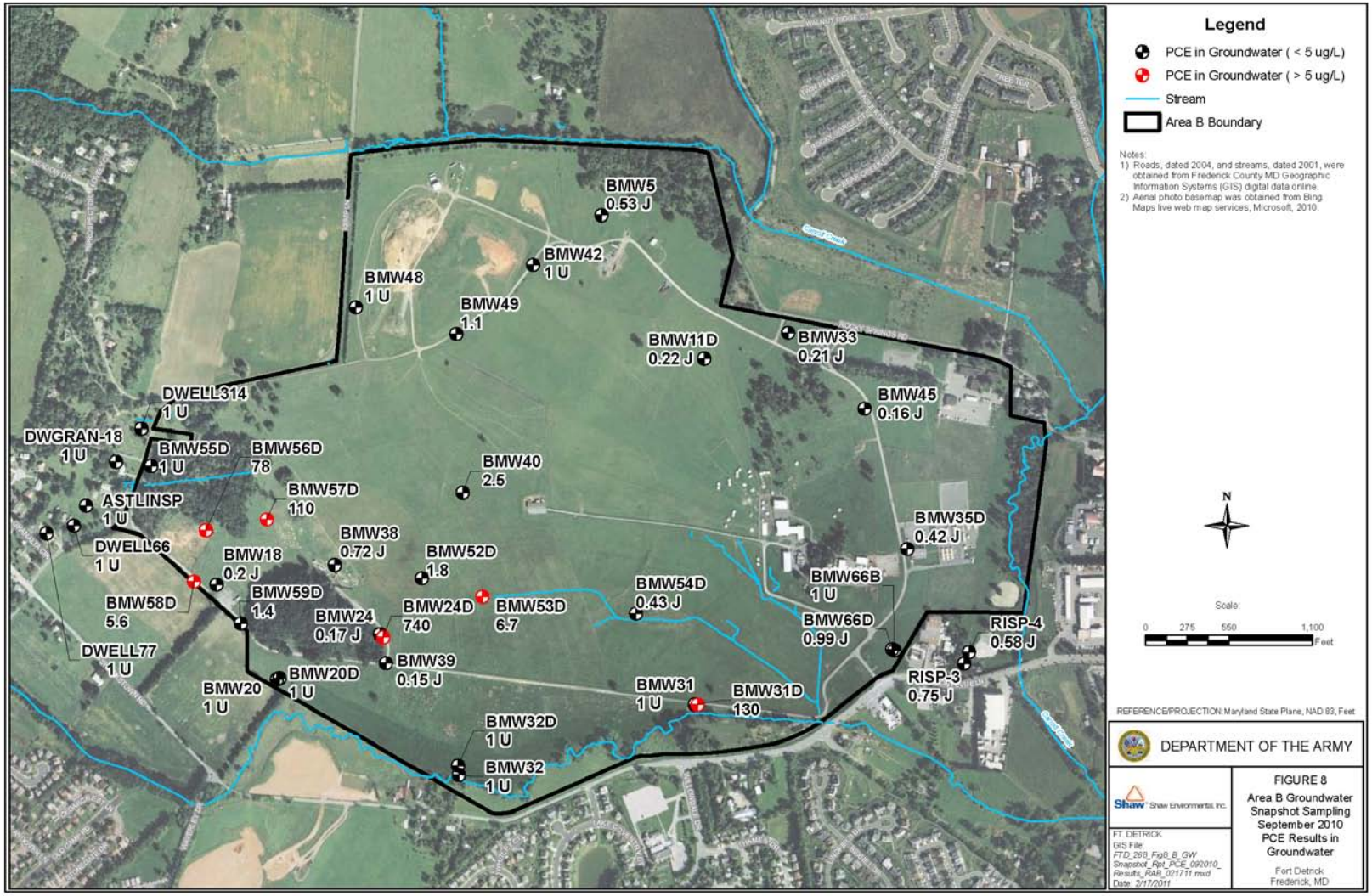
“Snapshot” Sample Results - TCE



TCE Sample Results Summary

- TCE concentrations ranged from 0.32 – 1,400 µg/L
- Highest observed TCE concentration reported in well BMW57D (1,400 µg/L), which is located near the former Area B-11 chemical waste disposal trenches. This concentration is below the historical high of 1,900 µg/L reported in September 2006.
- Overall, the TCE plume is largely unchanged from the previous sampling events; although, it should be noted that the Area B wells have not been sampled recently
- One notable increase of TCE was in BMW56D, which last was sampled in July 2007 (86 µg/L), and had a concentration of 730 µg/L in September 2010
- BMW57D exhibited a decrease of TCE from 1,800 µg/L in March/May 2007 when the well was last sampled
- The next highest concentrations of TCE are in BMW56D (730 µg/L) and BMW58D (120 µg/L), which are also located near the former Area B-11 disposal trenches
- TCE was only detected in the off-site spring samples. The MCL of 5 µg/L was exceeded in both spring sample RISP-3 (7.4 µg/L) and spring sample RISP-4 (5.2 µg/L)

“Snapshot” Sample Results - PCE



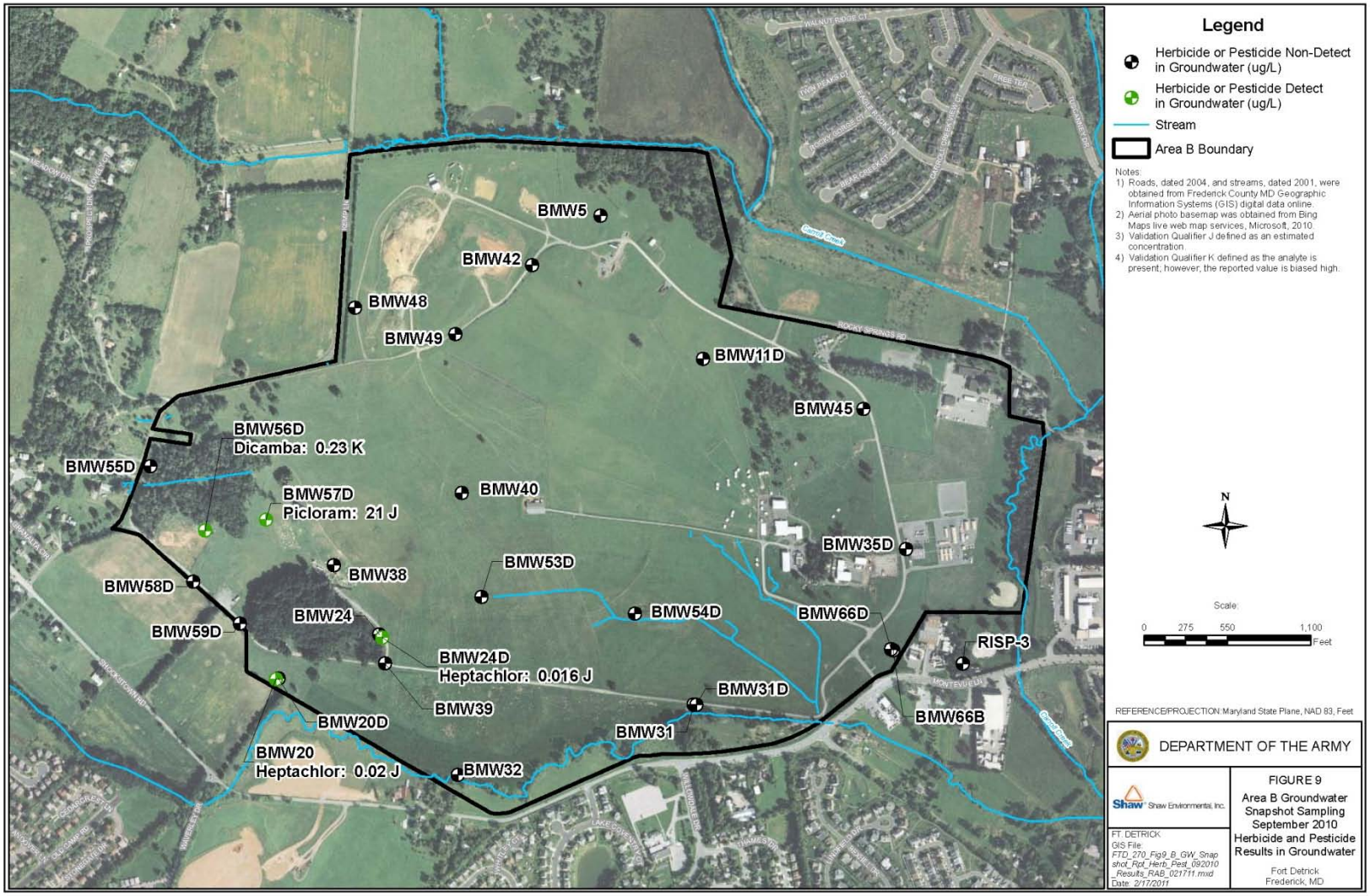
PCE Sample Results Summary

- PCE concentrations ranged from 0.15 – 740 µg/L
- Highest observed TCE concentration was reported in well BMW24D (740 µg/L)
  - This concentration is below the historical high of 200,000 µg/L reported in August 1998 in well BMW57D
  - This represents an increase in concentration since this well was last sampled in March 2008 (48 µg/L)
- Overall, the PCE plume is largely unchanged from the previous sampling events, with one notable exception in BMW24D
- PCE was only detected in off-site spring samples, RISP-3 (0.8 µg/L) and RISP-4 (0.6 µg/L), well below the MCL of 5 µg/L.

“Other” VOC Sample Results Summary

- A total of 41 samples were collected and analyzed for VOCs. Other VOCs (excluding TCE and PCE) detected in Area B wells and residential samples are discussed below.
  - The MCLs and tap water screening levels (SLs) were exceeded in Area B groundwater samples for six VOCs (1,1-DCE, 1,2-DCA, benzene, chloroform, cis-1,2-DCE, and VC) and tap water SLs also for 1,1-DCA and ethylbenzene
  - All VOCs results detected in September 2010 were within the range of historical concentrations, with the exception of 1,1,-DCA and 1,1-DCE, which were detected in BMW57D at concentrations slightly above the historical ranges
  - Other than well BMW57D, the well with the highest concentrations of VOCs was observed in the samples collected from well BMW56D, which is also located near the former Area B-11 waste disposal trenches
  - Freons (Freon 113, Freon 12, and Freon 11) were not detected above available groundwater screening levels
  - The VOC, 1,2,3-trichloropropane, was not detected in any of the 41 groundwater samples
  - Chloroform was the only “other” VOC detected above screening levels in off-site spring samples. Concentrations exceeded the tap water SL in spring samples RISP-3 and RISP-4, but were well below the MCL in both samples.

"Snapshot" Sample Results – Herbicides and Pesticides/PCBs



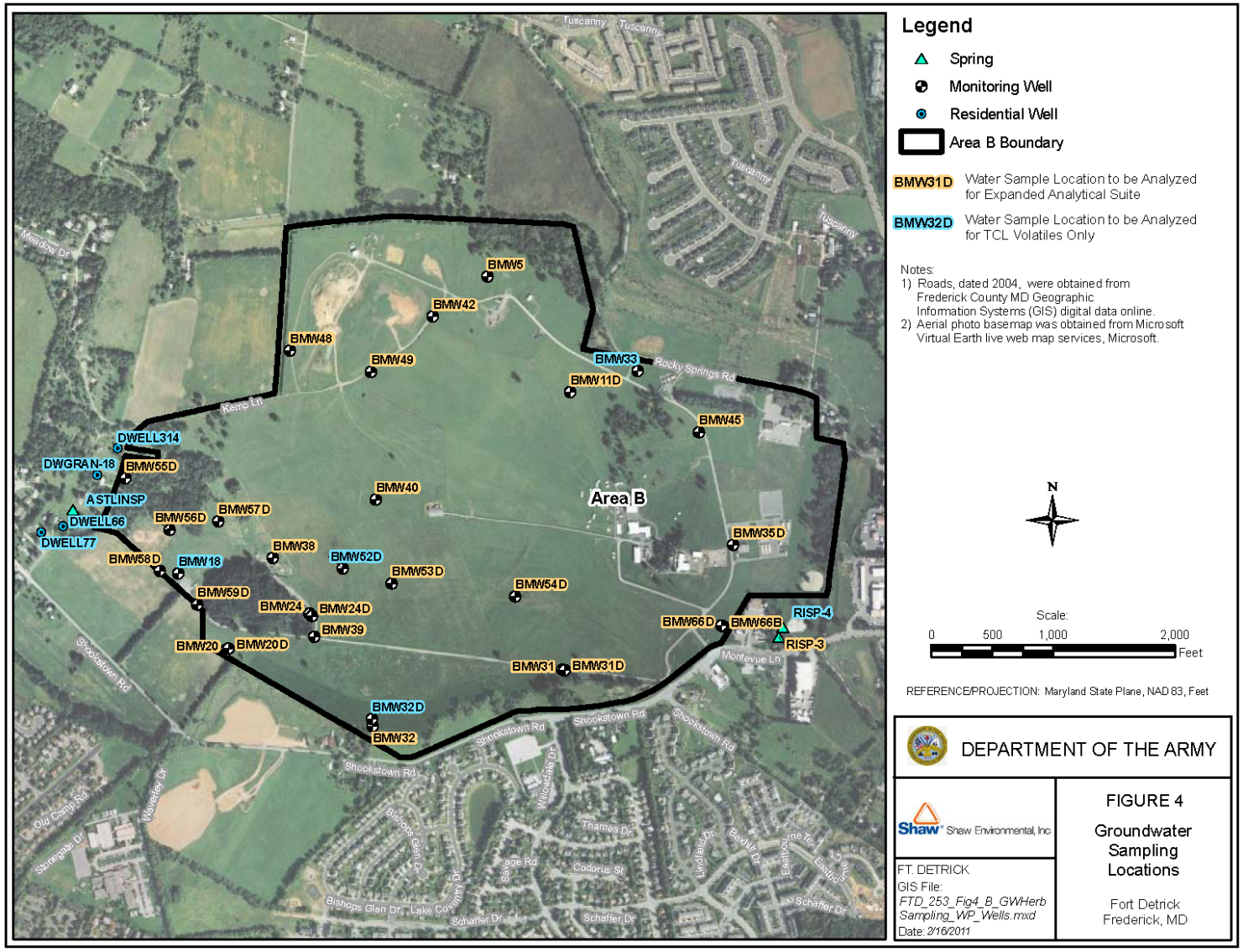
Herbicides and Pesticides/PCBs Sample Results Summary

- A total of 26 samples were collected and analyzed for herbicides and pesticides/PCBs
- Only two herbicides were detected during the sampling event (dicamba and picloram)
  - Dicamba was only detected once in well, BMW56D (0.23 µg/L), at a concentration below its available groundwater screening level. It has not been previously detected in Area B wells.
  - Picloram was also only detected in one well (BMW57D) at 21 µg/L, a concentration well below its available groundwater screening criterion. It has not been previously analyzed in Area B groundwater samples
- Only one pesticide (heptachlor) was detected during the Groundwater Snapshot Sampling Event. Heptachlor was detected above the tap water SL of 0.015 µg/L in well BMW20 (0.02 µg/L) and well BMW24D (0.016 µg/L), but below the MCL (0.4 µg/L).
  - The 0.02 µg/L detection in BMW24D represents the maximum concentration in Area B wells
  - Historical heptachlor concentrations have been below screening levels, except in well BMW20 when the concentration (0.016 µg/L) slightly exceeded the tap water SL in July 2005
- Detected herbicides and pesticides were all located near the former Area B-11 waste disposal trenches

Herbicides and Pesticides/PCBs Sample Results Summary (Continued)

- 2,4,5-T and 2,4-D, the components of agent orange, were analyzed using EPA Method 8151A (Herbicides)
  - 2,4,5-T and 2,4-D were not detected in any samples
- No PCBs were detected and have not previously been detected in Area B wells
- No herbicides, pesticides, or PCBs were detected in any residential samples

“Snapshot” Sample Locations – SVOCs and Metals



*** SVOC and metals sample locations shown in orange**

SVOC Sample Results Summary

- 19 SVOCs were detected in the Area B wells sampled during the Groundwater Snapshot Sampling Event
- 7 of the 19 SVOCs were detected above tap water SLs [1,2,4-trichlorobenzene, 1,4-dichlorobenzene, 1,4-dioxane, 2,6-dinitrotoluene, bis(2-Ethylhexyl)phthalate, naphthalene, and N-nitrosodi-n-propylamine]
  - Sample results were within the range of historical concentrations with the exception of 1,2,4-trichlorobenzene; 2,6-dinitrotoluene; and naphthalene
  - N-nitrosodi-n-propylamine was only detected in well BMW38. It has not been previously detected in Area B wells
  - 1,4-dioxane was only detected in two wells (BMW56D and BMW57D). It has only been recently analyzed in Area B aqueous samples.
- No MCLs were exceeded
- The highest detected SVOC concentrations were observed in well BMW56D, followed by well BMW57D, which are both located near the former Area B-11 waste disposal trenches
- No SVOCs were detected in any residential samples

Metals Sample Results Summary

- A total of 17 metals were detected in Area B wells
- Three metals (aluminum, iron, and manganese) exceeded their respective MCLs
- Five metals were detected above tap water SLs (arsenic, cobalt, iron, manganese, vanadium)
- Highest concentrations of metals were detected in well BMW56D, which is located near the former Area B-11 chemical waste disposal trenches
- Metals concentrations were within the lower range of historically detected concentrations
- No other discernable patterns were observed from metals detections and exceedances