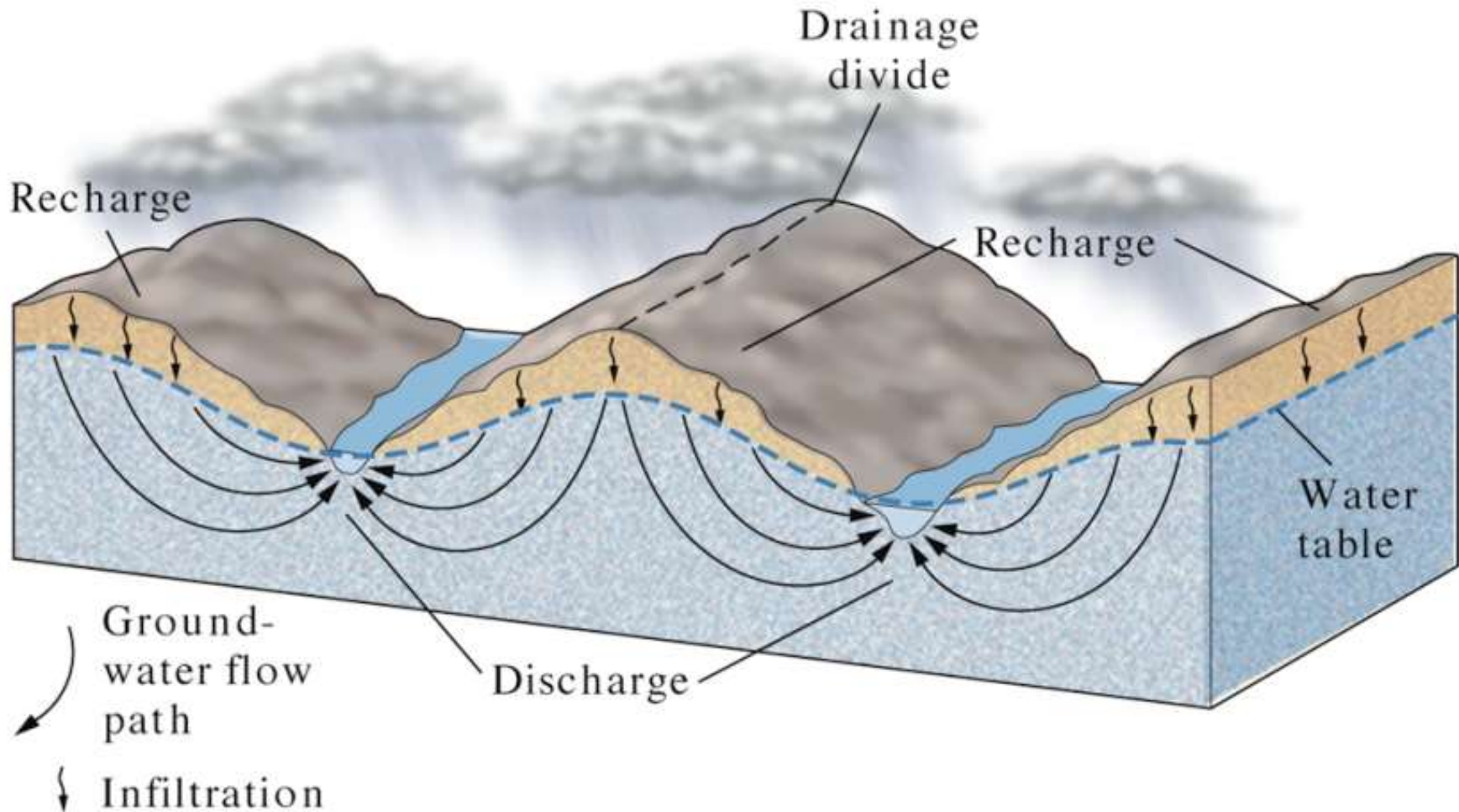


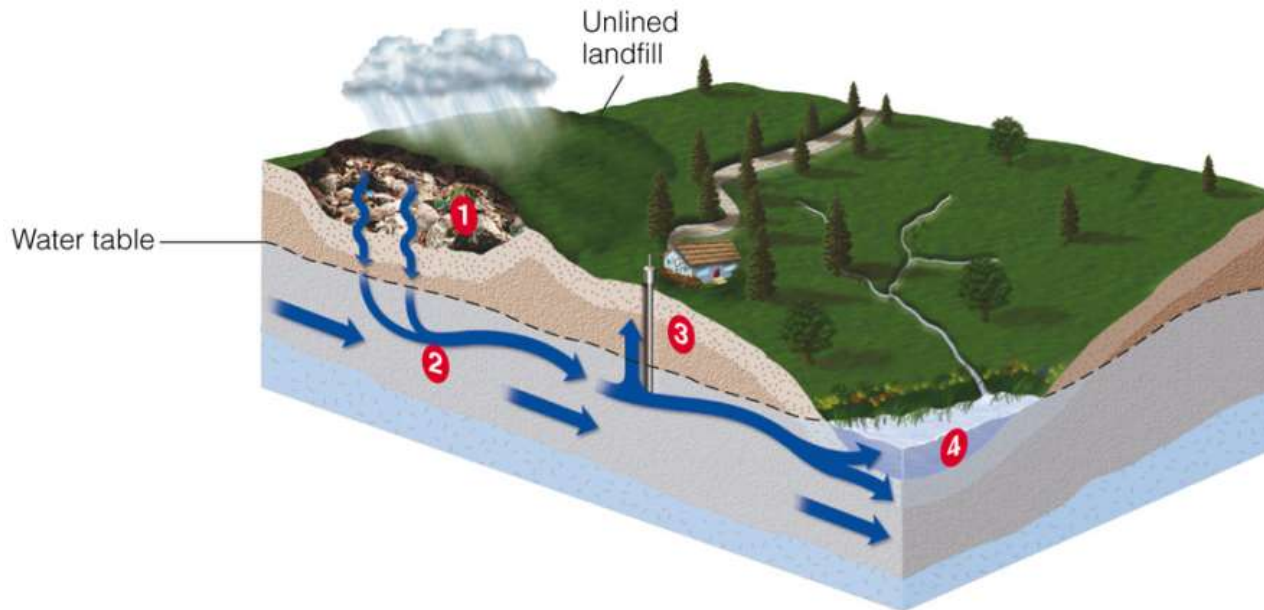
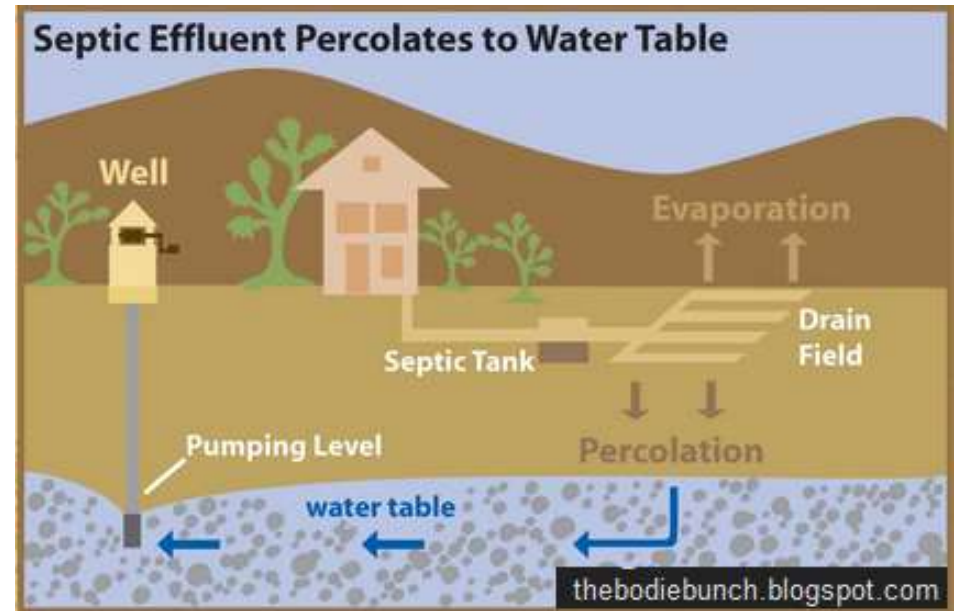
LAB 9. TWO GROUNDWATER-POLLUTION CASES

Groundwater Movement mostly occurs by the work of gravity and water flows down hill, but generally very slowly in the ground (cm to meters/day)



Groundwater Pollution

- Groundwater contamination can be natural and anthropogenic.
- Contamination from anthropogenic and animal sewage, landfills, and toxic waste is becoming a serious problem.



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LAB 9. TWO NJ GROUNDWATER-POLLUTION CASES

Case 1. Naturally-occurring Arsenic in groundwater

Date modified	Name	Type	Size
10/23/2011 ...	4_Indian_Creek_Rd_Alexandria_NJ_2008-11.wmv	Windows Media A...	257,735 KB
	Spayd_overview.avi	Video Clip	26,155 KB

(9 min)

Case 2. Rural to Suburban Dumping of Anthropogenic Industrial Waste and Subsequent Residential Development

Name	Date modified	Type	Size
Byram_Brookwood_Ave_GWI_2009-09_Take3.wmv	10/5/2009 10:05 PM	Windows Media A...	145,649 KB

(13 min)



Naturally-occurring Arsenic in groundwater

First noticed problem with municipal drinking water analyte concentrations that exceeded drinking-water standards.

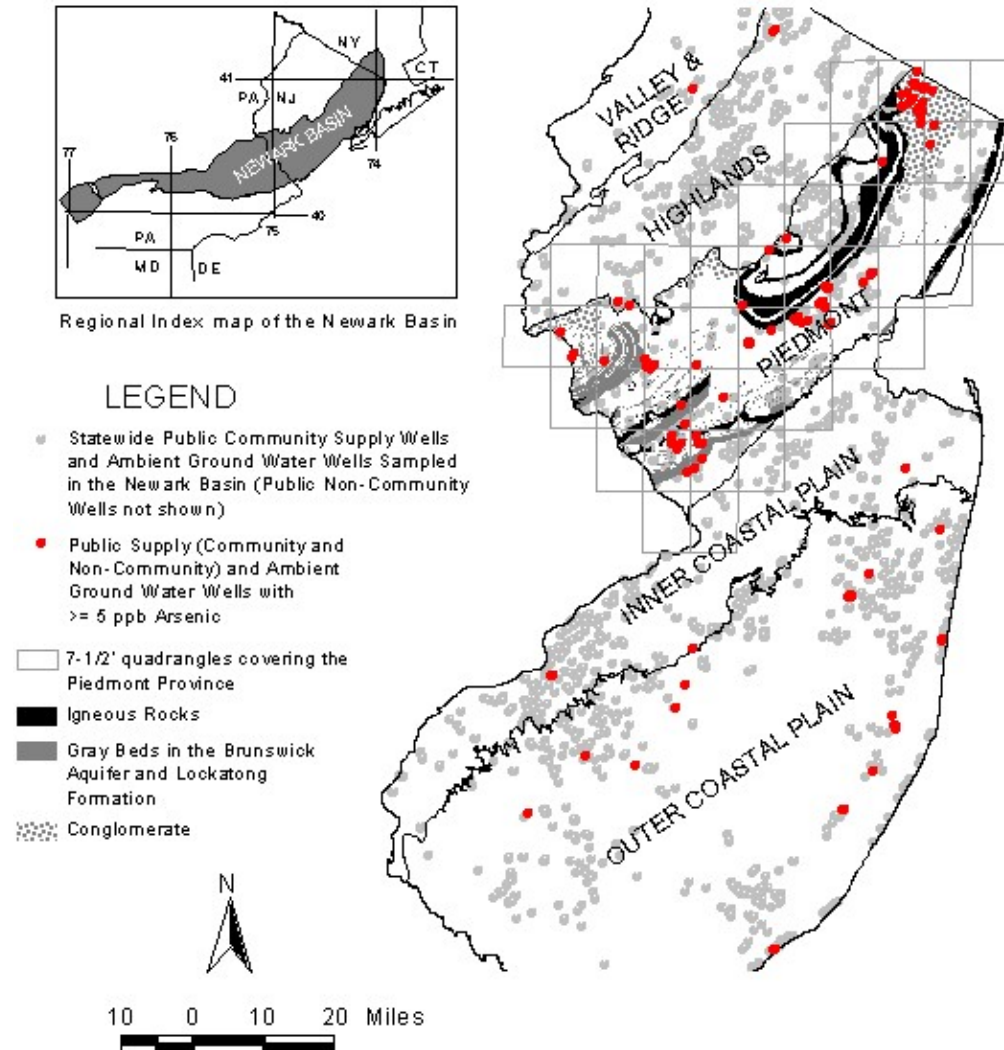
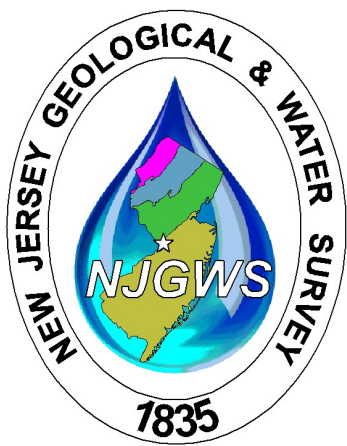


Figure 1. Map showing occurrences of Arsenic at concentrations of 5 ppb and higher in public supply wells and ambient ground water wells in New Jersey. The distribution of wells in the Piedmont province is shown in relation to "gray beds", igneous rocks, and conglomerate in the New Jersey part of the Newark Basin.



NJGWS
1997 – 2000
Research on
Naturally
Occurring Arsenic
in Groundwater
of the Newark
Basin, NJ

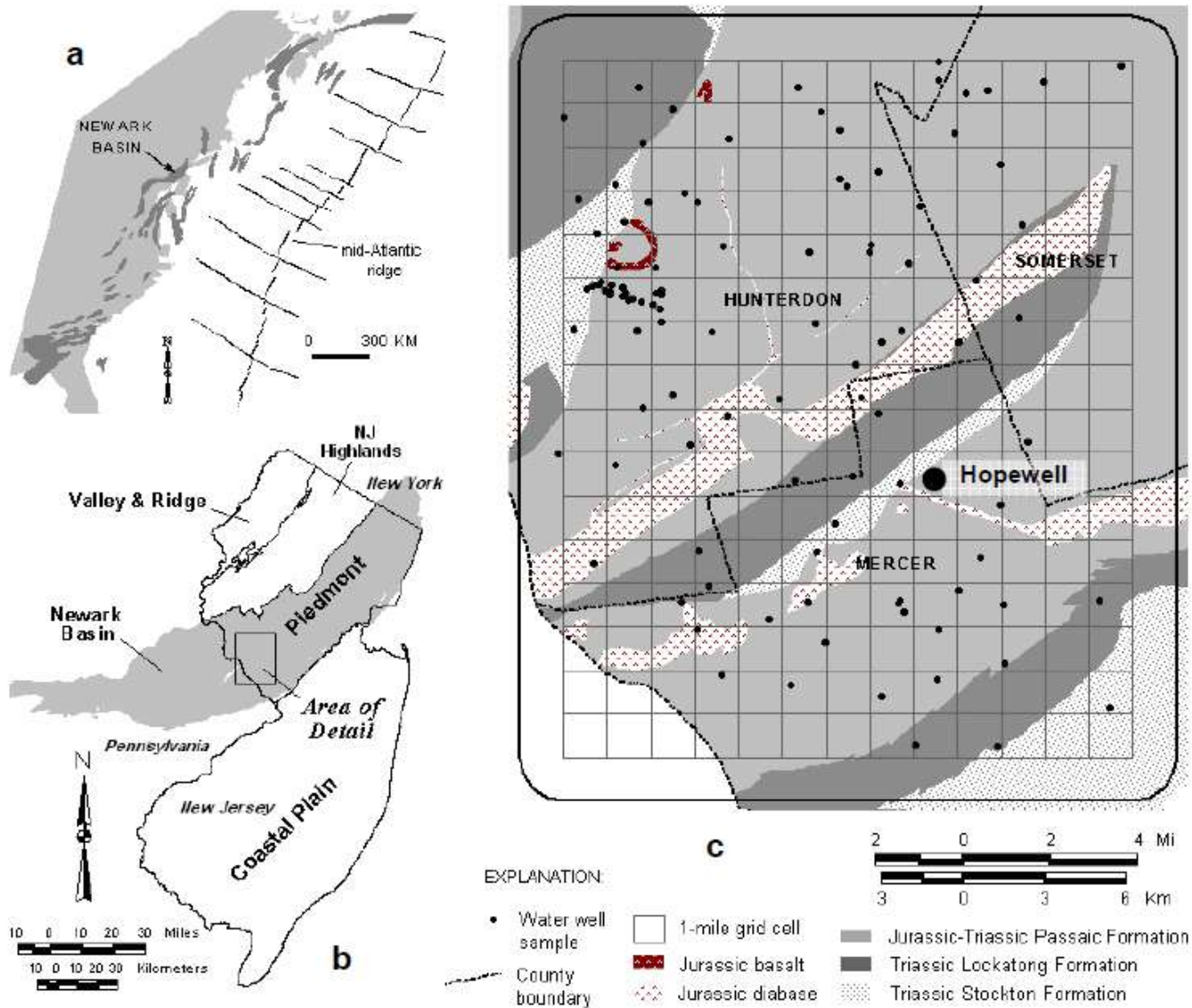


Figure E1. a) Rift basins of eastern North America and the Newark basin (modified from Schlische, 1992). b) Newark basin in relation to New Jersey. c) The 520-square-kilometer study area and location of wells sampled. Fifteen percent of wells sampled had water exceeding 10 µg/L arsenic. The Passaic and Lockatong Formations had highest occurrence and concentrations of arsenic. A detailed study was done in Hopewell.



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Private Well Testing Act (PWTa)

Required when selling or leasing a home or multi-unit dwelling with private well

- [An Overview](#)
- [Frequently Asked Questions](#)
- [Statutory and Regulatory Authority](#)
 - [Private Well Testing Act, N.J.S.A. 58:12A-26 et seq.](#)
 - [Private Well Testing Act regulations, N.J.A.C. 7:9E et seq.](#) – Full text of the rules that implement the Act
 - [Adoption and Response to Comments Document for the Private Well Testing Act regulations, N.J.A.C. 7:9E et seq.](#) - This document provides useful insight into the issues that the Department considered before adopting the Rule
 - [Regulations Governing the Certification of Laboratories & Environmental Measurements, N.J.A.C. 7:18 et seq.](#)
- [List of New Jersey Certified Laboratories](#)
- [Additional Resources:](#) educational, remediation/treatment funding, treatment devices and health effects
- [Technical Resources](#)
 - [Required Parameters for Private Well Testing](#)
 - [Global Positioning System \(GPS\) Requirements for Spatial Data Collection](#)
 - [Office of Information Resources Management \(OIRM\), Bureau of Geographic Information Systems \(BGIS\)](#)
 - [US Army Corps of Engineers – Army Geospatial Center](#)
 - [New Jersey Private Well Water Test Reporting Form](#) - A form used exclusively by laboratories reporting well test results to their clients.
- [Directory of New Jersey Health Departments](#)
- [PWTa data](#)
 - [Initial Well Test Results for September 2002 - March 2003](#)
 - [Well Test Results For September 2002 - April 2007](#)
 - [Addendum to Well Test Results For September 2002 - April 2007](#)
 - [Well Test Results, September 2002-April 2009](#)
- [Laboratory Reporting of Results](#)
- [Contact us](#)



Compounds in Groundwater

PWTA Program Volatile organic compounds (VOCs) results* 2002-2007

		number of exceedances																										
County	Municipality	No. of Wells	Benzene	Carbon Tetrachloride	Chlorobenzene	1,2-Dichlorobenzene	1,3-Dichlorobenzene	1,4-Dichlorobenzene	1,1-Dichloroethane	1,2-Dichloroethane	1,1-Dichloroethyl ether	1,2-Dichloroethyl ether	1,2-Dichloropropane	Ethylbenzene	Methyl tertiary butyl ether	Methylene Chloride	Naphthalene	Styrene	1,1,2,2-Tetrachloroethane	Tetrachloroethylene	Toluene	1,2,4-Trichlorobenzene	1,1,1-Trichloroethane	1,1,2-Trichloroethane	Trichloroethylene	Vinyl Chloride	Xylenes	
Atlantic	Absecon City	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Atlantic	Buena Boro	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	
Atlantic	Buena Vista Twp	438	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	
Atlantic	Corbin City	37	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	
Atlantic	Egg Harbor City	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Atlantic	Egg Harbor Twp	446	1	0	0	0	0	0	0	0	0	0	0	0	1	2	0	0	0	0	7	0	0	0	0	4	0	
Atlantic	Estell Manor City	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Atlantic	Folsom Boro	107	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	
Atlantic	Galloway Twp	432	1	0	0	0	0	0	0	0	0	0	0	2	0	0	1	0	0	1	0	0	0	0	1	4	1	
Atlantic	Hamilton Twp	489	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	6	0	
Atlantic	Hammononton Twp	148	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	3	0	0	0	0	0	2	0	
Atlantic	Linwood City	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Atlantic	Mullica Twp	385	4	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	1	0	
Atlantic	Northfield City	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Atlantic	Pleasantville City	57	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	
Atlantic	Fort Republic	57	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Atlantic	Gomers Point	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Atlantic	Weymouth Twp	65	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	
Totals		2850	8	2	0	0	0	0	0	0	0	3	0	4	0	4	3	0	0	2	16	0	0	0	1	20	1	0
Bergen	Atlantide Boro	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bergen	Alpine Boro	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bergen	Bergenfield Boro	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bergen	Carlstadt Boro	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bergen	Closter Boro	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bergen	Cresskill Boro	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bergen	Demarest Boro	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bergen	Dumont Boro	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bergen	Elmwood Park Boro	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bergen	Emerson Boro	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bergen	Franklin Lakes Boro	324	0	0	0	0	0	0	0	1	0	0	0	0	2	2	0	0	0	0	0	0	0	0	1	0	0	
Bergen	Glen Rock Boro	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bergen	Haworth Boro	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bergen	Hillsdale Boro	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bergen	Hohokus Boro	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bergen	Mahwah Twp	108	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	
Bergen	Midland Park Boro	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	1	0	
Bergen	Montvale Boro	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bergen	Moonachie Boro	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	
Bergen	Norwood Boro	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bergen	Oakland Boro	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bergen	Old Tappan Boro	2	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	
Bergen	Oradell Boro	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bergen	Paramus Boro	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bergen	Ramsey Boro	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bergen	Ridgefield Boro	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bergen	Ridgewood Village	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	
Bergen	River Vale Twp	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bergen	Rockleigh Boro	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bergen	Saddle Brook Twp	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	
Bergen	Saddle River Boro	237	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	0	
Bergen	Teaneck Twp	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	
Bergen	Tenafly Boro	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bergen	Upper Saddle River	423	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bergen	Washington Twp	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bergen	Westwood Boro	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bergen	Woodcliff Lake Boro	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bergen	Wyckoff Twp	29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total		1257	0	0	0	0	0	0	0	1	2	0	0	0	2	2	0	0	0	0	15	0	0	0	0	7	0	0

Private Well Testing Act 2003

Q9: What contaminants must the well water be tested for?

A9: That depends on where you live. All wells must be tested for the following contaminants:

- total coliform bacteria,
- iron,
- manganese,
- pH
- volatile organic compounds (VOCs)
- nitrate, and
- lead.

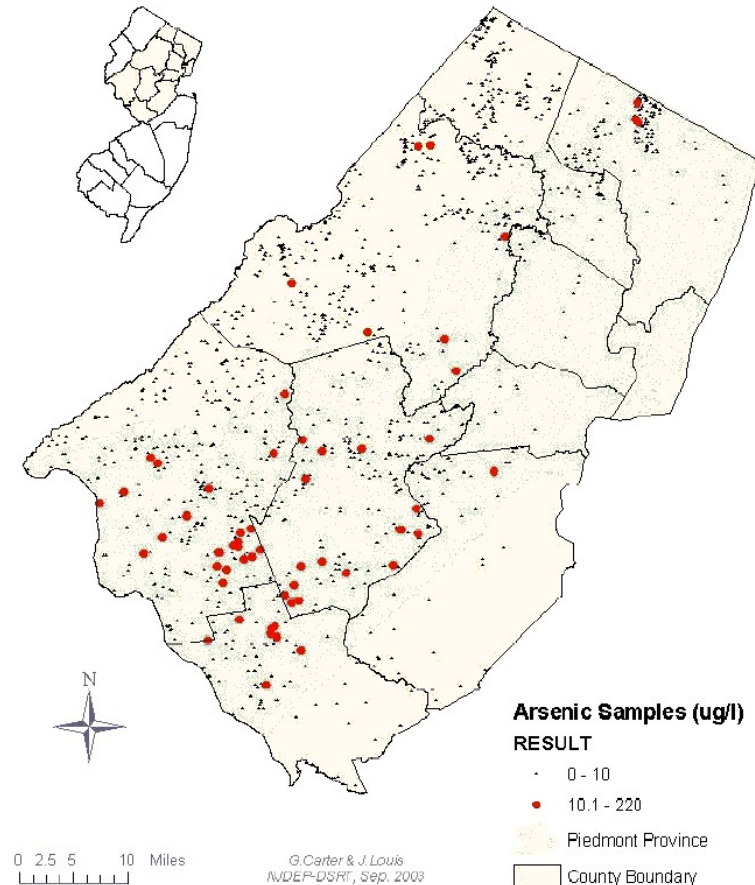
If total coliform bacteria are detected, a test must also be conducted for fecal coliform or E. coli.

Private wells located in certain counties will also have to test for

- arsenic,
- Mercury, and
- 48-hour rapid gross alpha particle activity.

Click [here](#) for a table showing all contaminants that must be tested.

PWTA Arsenic maximum-contaminant level (MCL) exceedances in 2003



PWTA Testing Requirements

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 DEPARTMENT OF ENVIRONMENTAL PROTECTION
 DIVISION OF WATER SUPPLY AND GEOSCIENCE



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List of Required Parameters for Private Well Testing

	Total Coliform	*Fecal Coliform or E.coli	Nitrate	Iron	Manganese	pH	VOCs	Lead	Arsenic	Mercury	Gross Alpha Particle Activity
Atlantic	X	X	X	X	X	X	X	X		X	2
Bergen	X	X	X	X	X	X	X	X	X		
Burlington	X	X	X	X	X	X	X	X		X	2
Camden	X	X	X	X	X	X	X	X		X	2
Cape May	X	X	X	X	X	X	X	X		X	3
Cumberland	X	X	X	X	X	X	X	X		X	1
Essex	X	X	X	X	X	X	X	X	X		
Gloucester	X	X	X	X	X	X	X	X		X	1
Hudson	X	X	X	X	X	X	X	X	X		
Hunterdon	X	X	X	X	X	X	X	X	X		3
Mercer	X	X	X	X	X	X	X	X	X		3
Middlesex	X	X	X	X	X	X	X	X	X		3
Monmouth	X	X	X	X	X	X	X	X		X	3
Morris	X	X	X	X	X	X	X	X	X		
Ocean	X	X	X	X	X	X	X	X		X	3
Passaic	X	X	X	X	X	X	X	X	X		
Salem	X	X	X	X	X	X	X	X		X	2
Somerset	X	X	X	X	X	X	X	X	X		
Sussex	X	X	X	X	X	X	X	X	4		
Union	X	X	X	X	X	X	X	X	X		
Warren	X	X	X	X	X	X	X	X	4		

*Fecal Coliform or E. Coli testing is required only if a sample tests positive for total coliform. See N.J.A.C. 7:9E-2.1(a)2.

- 1 = testing required starting March 15, 2003
- 2 = testing required starting September 16, 2003
- 3 = testing required starting March 16, 2004
- 4 = testing required starting March 14, 2008

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Last Updated: October 15, 2012

Case 1; Naturally occurring arsenic in groundwater, Indian Creek Rd. amplified by the discharge of chlorinated pool water.

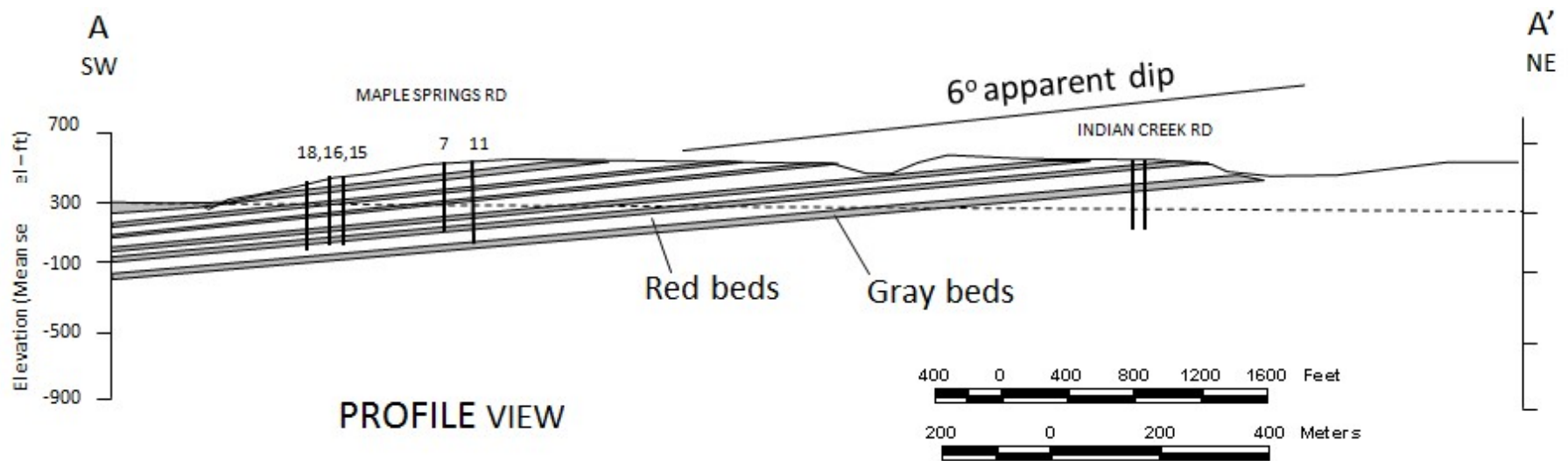


Indian Creek Rd



Maple Springs Rd

Hydrogeological profile (cross section) from Indian Creek Rd. to Maple Springs Road showing the shared penetrated interval



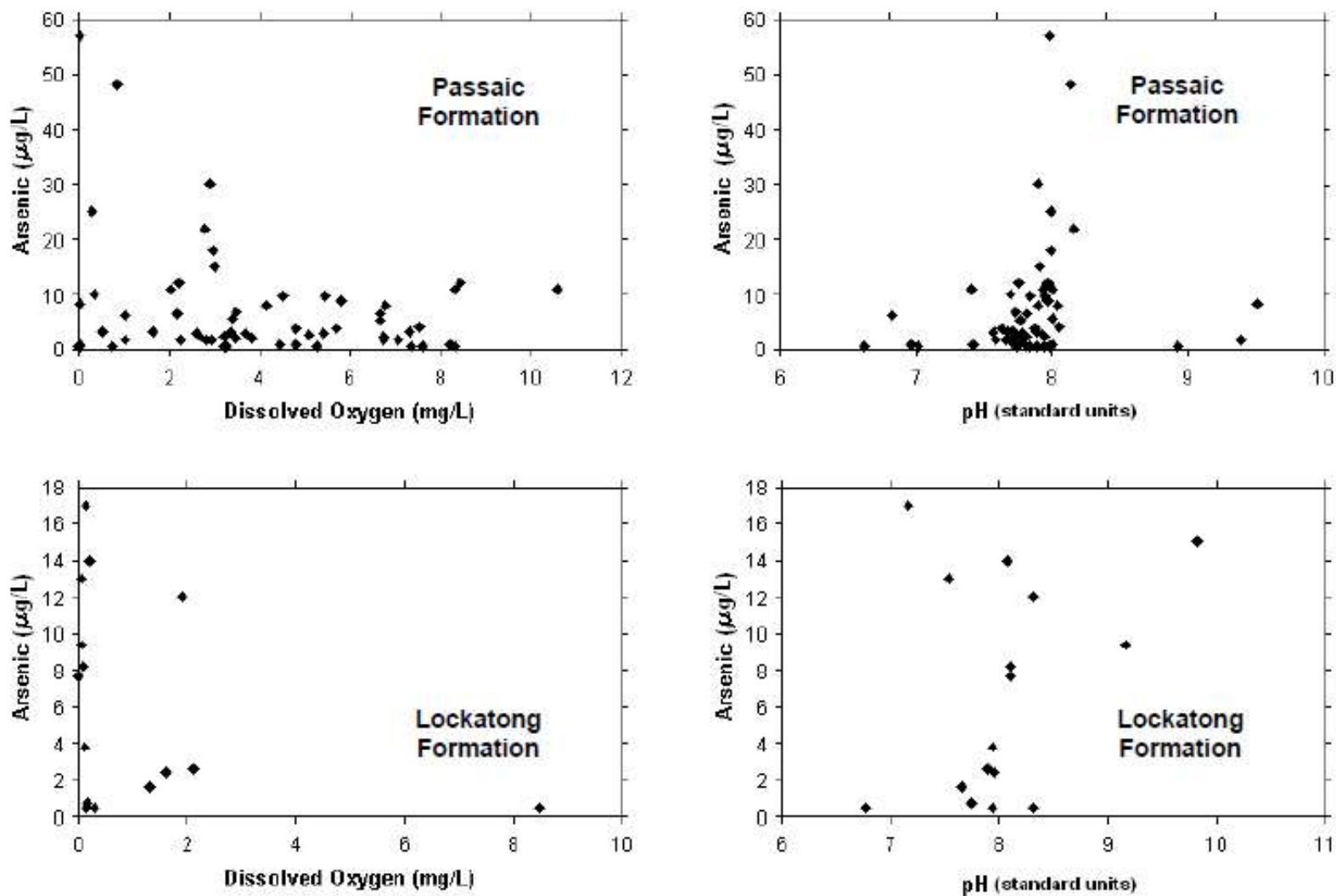


Figure E6. Arsenic versus dissolved oxygen and pH in groundwater from the Passaic and Lockatong Formations in the central part of the Newark basin in New Jersey.

Significant amounts of Arsenic in pyrite within the black shale and red mudstone

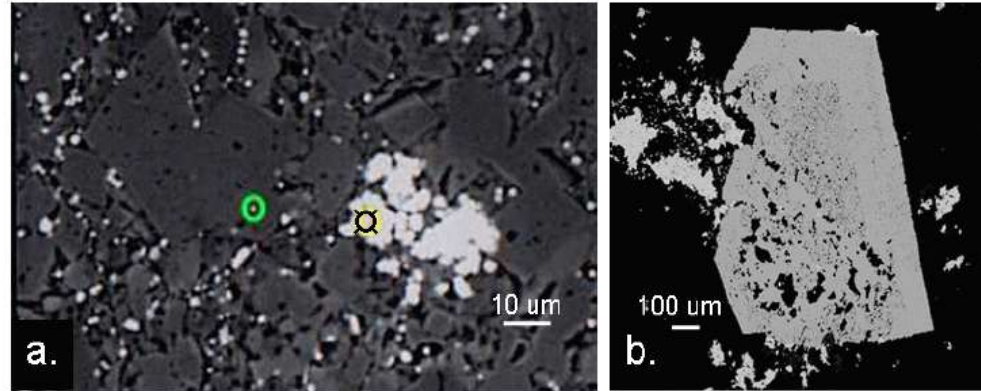


Figure E11. Scanning electron micrographs (SEM) of pyrite in black shale and gray mudstone from two members in the lower part of the Passaic Formation. a) SEM of shale from the Warford Member. Pyrite appears as bright areas in the dark gray calcite matrix. Arsenic concentrations in pyrite are 11,500 in the green circle to the left and 15,860 in the yellow mark (□) to the right (in mg/kg). b). SEM of large pyrite crystal (medium gray) with chalcopyrite (light gray) in mudstone matrix from the Kilmer Member. Arsenic concentrations in some pyrite are as much as 3000 mg/kg.

Sources, mobilization and transport of Arsenic

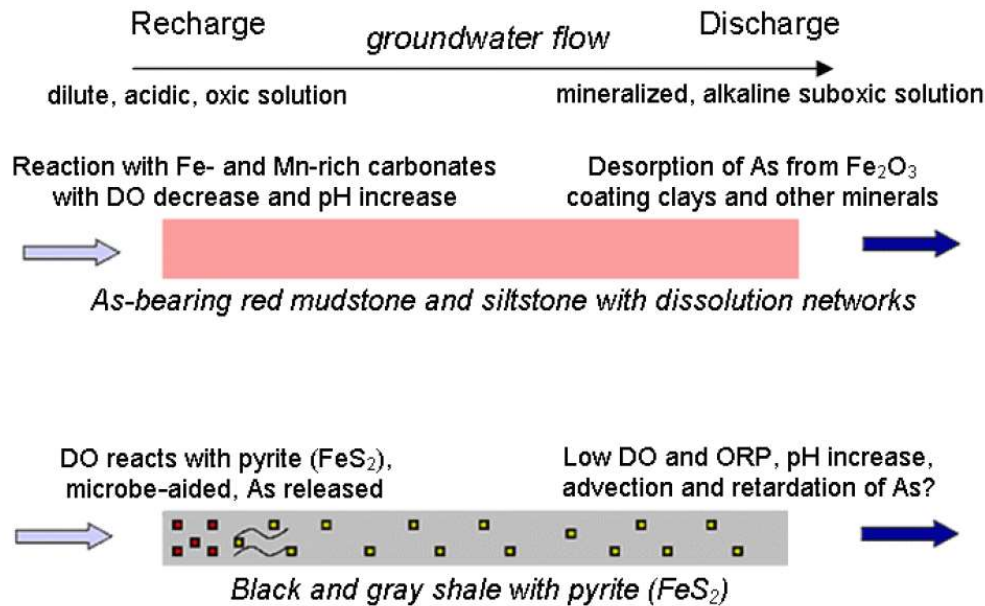
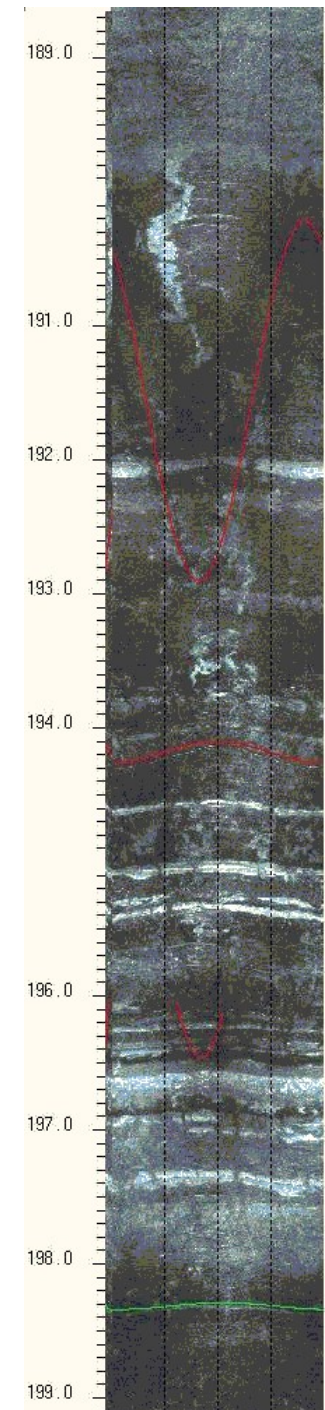


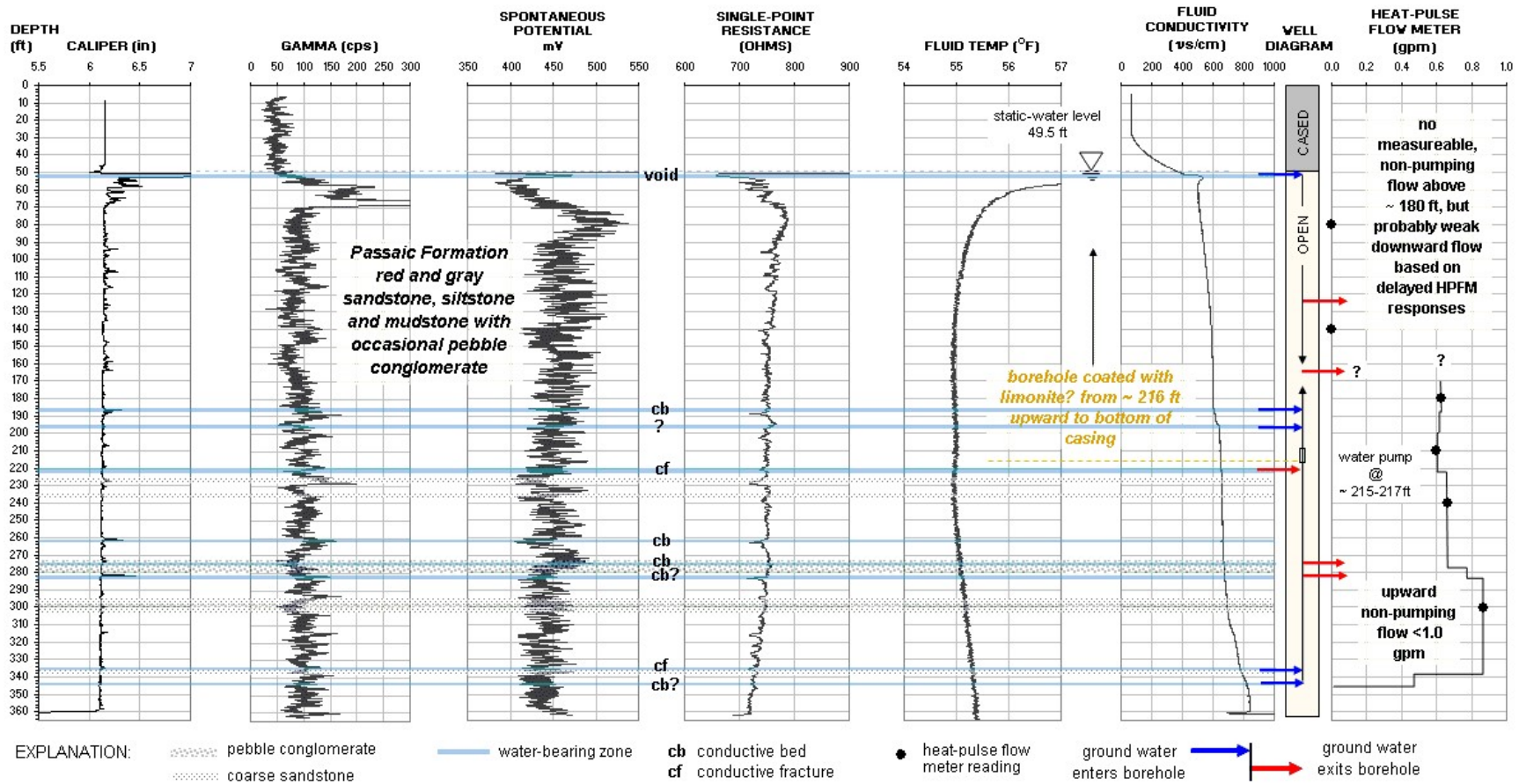
Figure E20. Diagram illustrating the conceptual models for the sources, mobilization and transport of arsenic in red mudstone and siltstone of the Passaic Formation and black and gray shale of the Lockatong and Passaic Formations in the Newark basin.



10/17/2008 Shallow ground water and pool water discharge may enter the well immediately below the casing at the fractures from 51-65 ft

Well 1 hydrogeological profile

150 ppb As



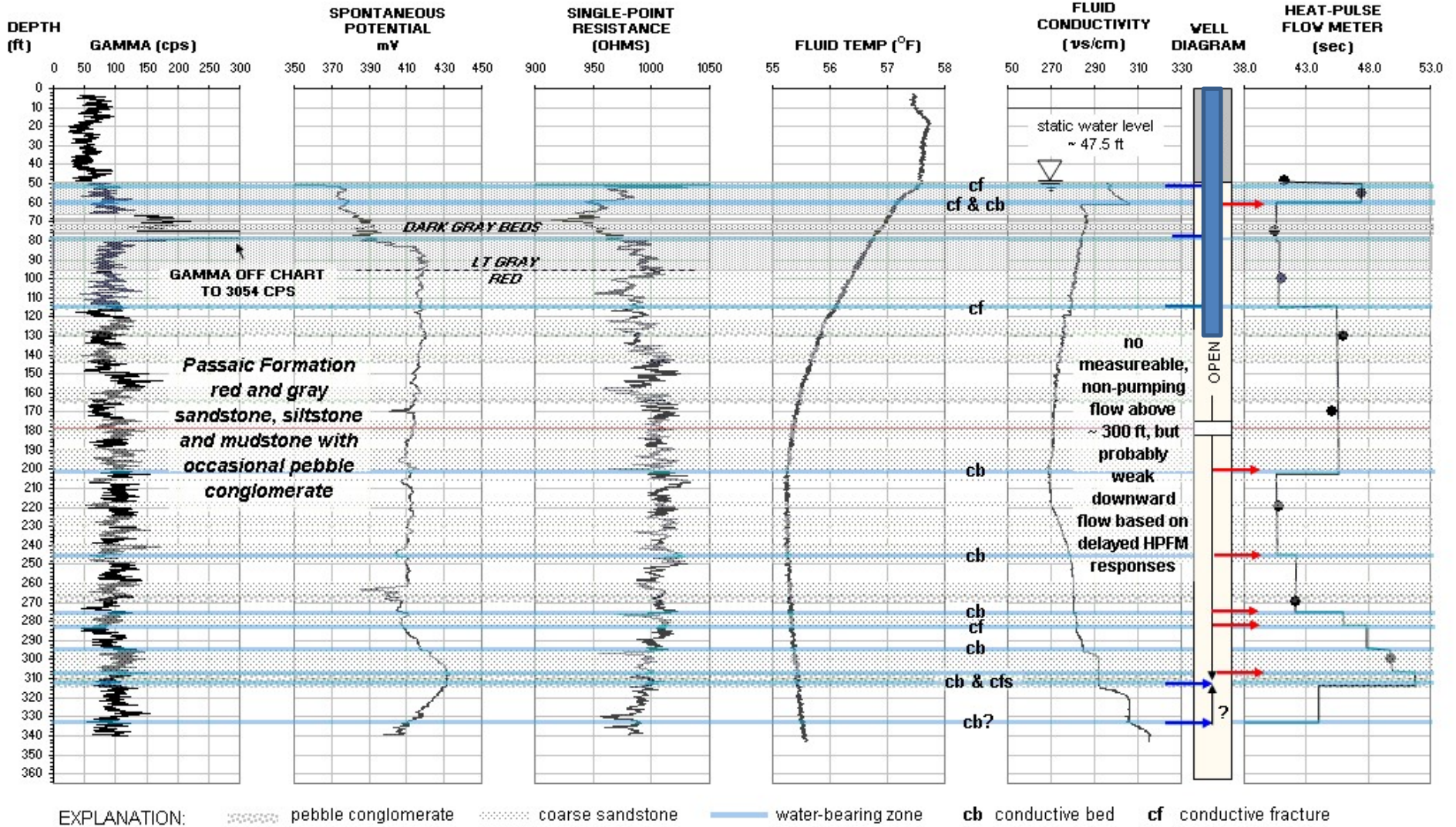
- The high gamma zone at 55-70 ft may represent a gray or black shale that could contain minerals with arsenic.

Conclusions from studying Well 1

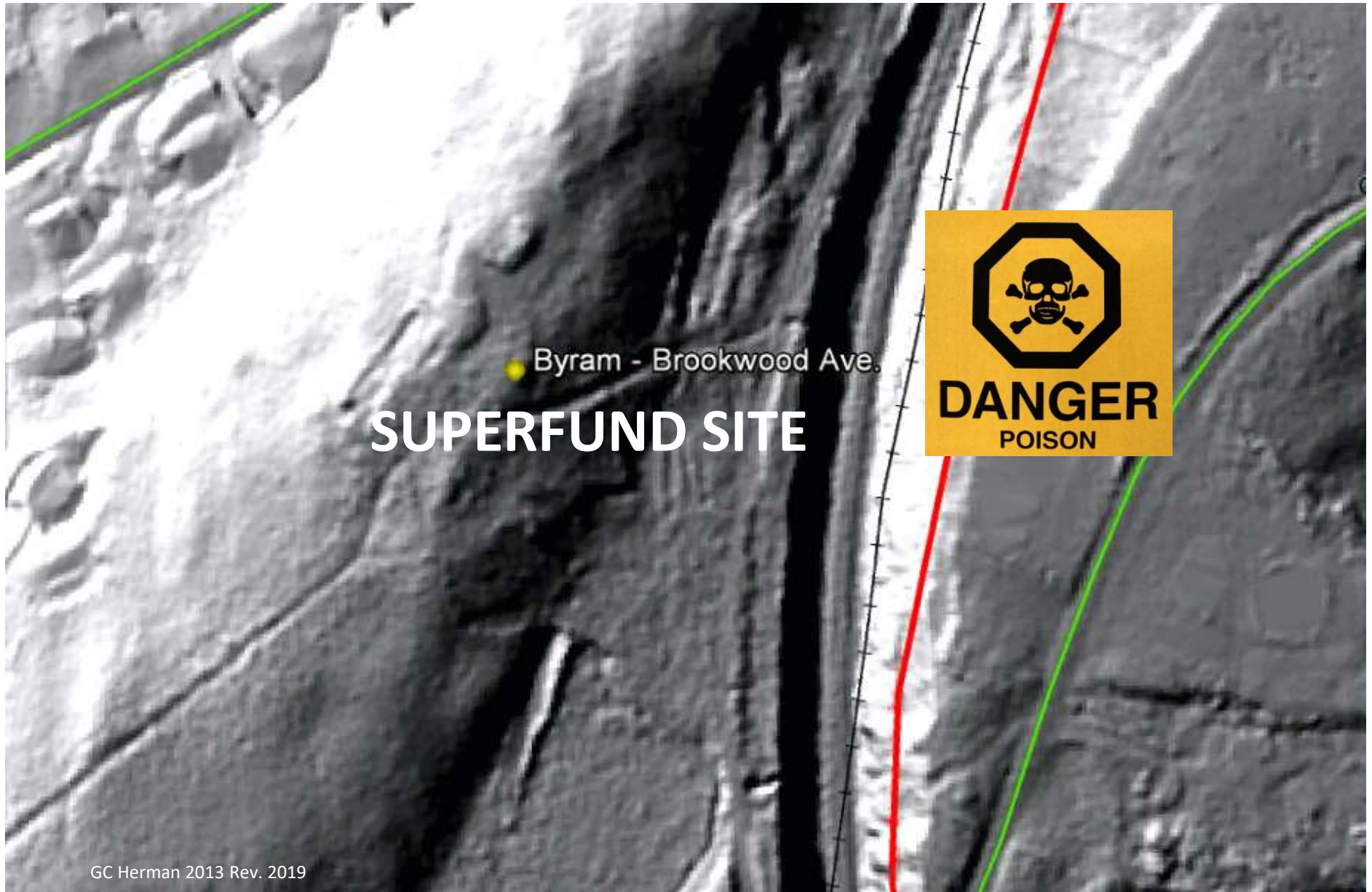
- Oxidized shallow ground water entering the well here may pick up arsenic and iron from this zone and take it down the well to the pump.
- Another possibility is that the deeper fracture zones at 261, 274 and others may be bringing in old mineralized ground water with arsenic.
- Both of these possibilities occurring at the same time is supported by the water quality data which show both As3 and As5 in the well water.
- *We will study the data to determine the most plausible conclusions and what they mean toward giving you recommendations on how to proceed.*

Well 2 was drilled through and completed with a grouted sleeve from the surface to 130 ft. depth

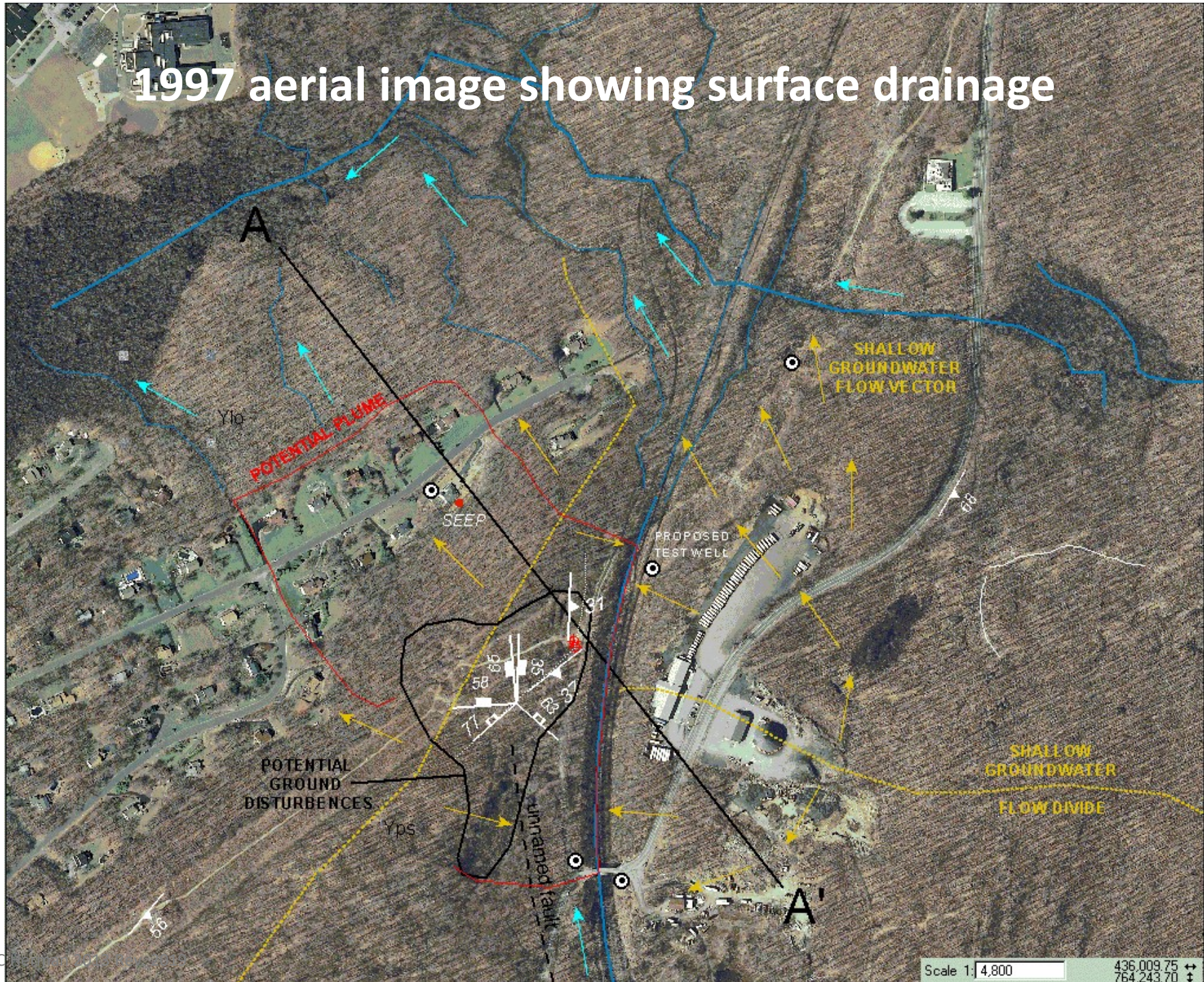
13 ppb As



Case 2; 2009 discovery and subsequent aspects of an industrial dump site in rural NJ on the National Priority Pollution List (Superfund)



1997 aerial image showing surface drainage

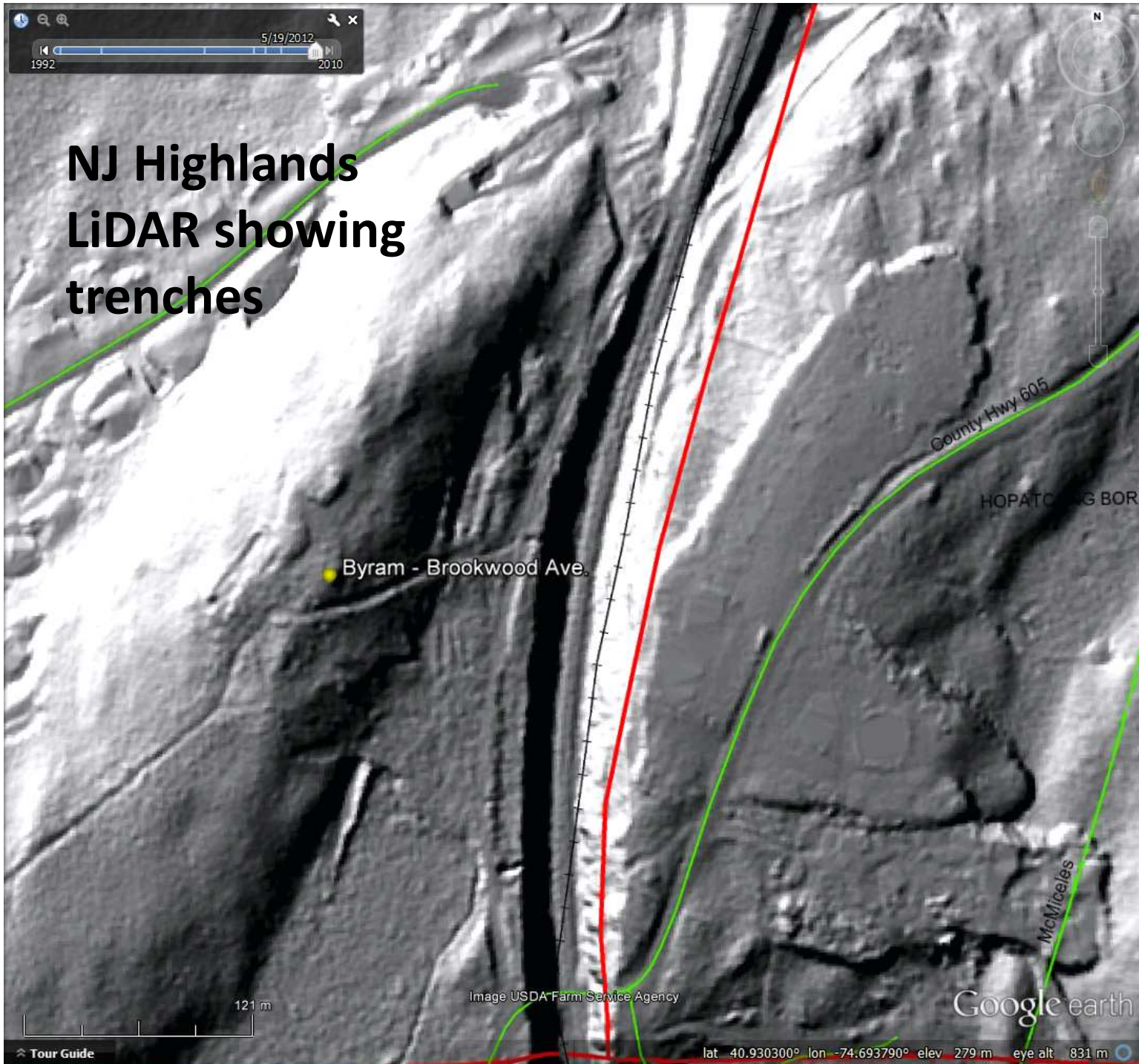


GC

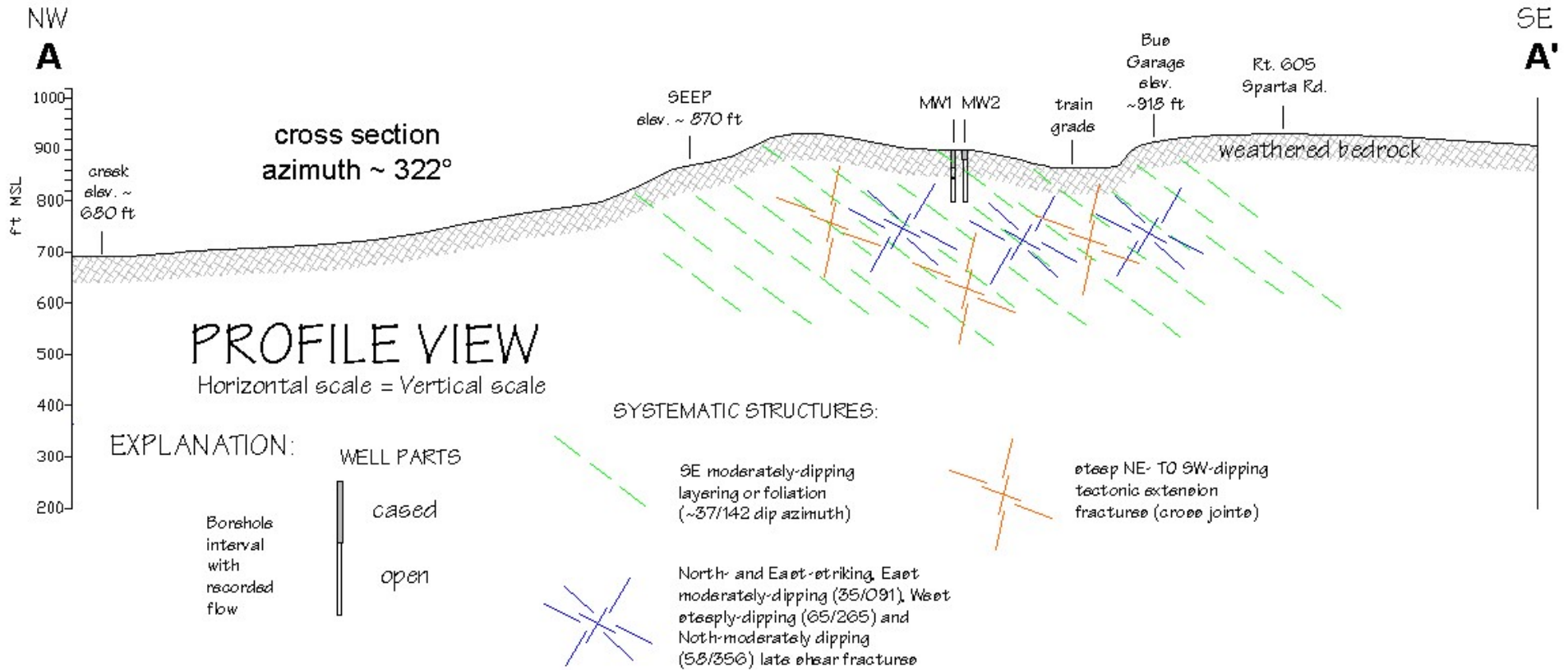
GE image showing bus garage and trenches



NJ Highlands LiDAR showing trenches



Hydrogeological profile





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Byram cleanup to take five years

2010

By LYND SAY CAYETANA BOUCHAL

lbouchal@njherald.com

BYRAM — The groundwater cleanup for the 17 township homes contaminated by the Mansfield Trail Dump Site, recently named a national Superfund site, won't begin for at least five years, said Environmental Protection Agency Project Manager Kristin Giacalone.

"I just want it to start," said Brookwood Road resident Donna Griff, whose home is among one of the contaminated.

The Mansfield Trail Dump Site in Byram and nine other hazardous waste sites nationwide were added to the U.S. Environmental Protection Agency's National Priorities List of Superfund sites in March. The Superfund is the federal program that investigates and cleans up the most complex, uncontrolled or abandoned hazardous waste sites in the country.

The Byram site, on a scale from zero to 100, was ranked 100 on the Hazard Ranking System. According to the EPA's web site, scores are based on the likelihood that the site has released or has the potential to release hazardous substances in the environment; the toxicity and quantity of the waste; and the people or environments affected by the release. The score, however, does not determine the extent of the contamination or appropriate response. EPA Project Manager Kristin Giacalone said waste sites that directly affect people and homes generally "max out the score."

At Monday's community update meeting, Giacalone said, any site scored higher than 28.5 is placed on the National Priorities List.

In 2009, the 17 residential wells on Brookwood Road and Ross Road in Byram were found to be contaminated with trichloroethylene, a volatile organic compound used as an extraction solvent, adhesive and general anesthetic. Chemical vapors from contaminated soil underneath some of these houses additionally seeped into the homes' basements.

The DEP installed carbon water filtration systems in many of the homes and vapor removal systems in five basements to remedy the undrinkable water and hazardous indoor air quality.

Exposure to the toxic substance, commonly referred to as TCE, has been linked to cancer of the kidney, liver, cervix and lymphatic system, according to the EPA's web site. Other health impacts include deleterious effects on the immune, endocrine and nervous systems, and congenital heart disease among children.

The TCE contamination has been linked to several toxic sludge-filled trenches in a wooded area near the intersection of the Mansfield bike path and Stanhope-Sparta Road, where waste was illegally dumped. The property, commonly referred to by locals as "Denny's Dump," was owned by Denny McConnel, who allegedly allowed people to dispose of their waste on his land in the 1950s. EPA site attorney Elizabeth LaBlanc said McConnel and his wife are deceased. A civil investigation is still ongoing.

While initial sampling, testing and evaluations on the contaminated and surrounding areas have already been conducted, EPA Public Affairs Specialist and Community Involvement Coordinator Pat Seppi said the process ahead is "arduous and bureaucratic."

A remedial investigation will be used to clean up the Mansfield Trail dump site, as it does not pose an immediate threat to the public or the environment. Remedial investigations also are implemented to clean up complex sites in need of long-term action, while immediate removal of toxic waste is reserved for emergencies.

Giacalone said the remedial investigation will take about three years to complete. A contract to execute the extensive studies will likely be awarded in upcoming weeks, she said, and will be followed by a feasibility study on different ways to clean the contamination. A proposed plan will then be made public with a 30-day comment period. And finally, a record of decision will be released. The cleanup of the groundwater contamination will follow, likely to begin in about five years.

"The history of superfund sites tend to take forever," Griff said. "I'm not pleased (that it will take several years to remedy). I'd like to see it done in a year or two, but I understand the bureaucracy."

About 30 Byram residents attended the meeting Monday. Some members of the East Brookwood Estates Property Owners Association rose concerns that the contamination may spread to other neighborhoods, including their own. Giacalone assured them that the EPA will continue to sample wells, pinpoint the path the contaminated groundwater is moving, and noted that the association's frequent well water testing has not indicated any problems thus far.

Other residents brought up their plummeting home values and the additional \$1,500 maintenance fee a new homeowner would acquire for his or her water treatment system, which the state would no longer waive if ownership changes hands. Currently, the state Department of Environmental Protection takes care of the quarterly testing and annual maintenance estimated at \$1,500, but state regulations mandate that any new owners must maintain the system themselves.

Griff also voiced her concern that any child or adult could unknowingly wander onto the dump site and requested the signs or a fence to close off the area.

The meeting was also used to organize a Citizens Advisory Group to assist and drive forward the cleanup process. Griff said she will absolutely join the committee.

"I don't want to be on the (National Priorities List) for 20 years," she said. *Created: 4/12/2011 | Updated: 4/15/2011*



2017

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MANSFIELD TRAIL DUMP BYRAM, NJ

Announcements and Key Topics

To view the OU1 Record of Decision: [click here](#)

Background

The Mansfield Trail Dump site (the Site) consists of former waste disposal trenches located on wooded, undeveloped properties and associated groundwater contamination in an adjacent residential neighborhood in Byram Township, ...

[Continue reading background »](#)

Site Contacts

Community Involvement Coordinator

[Patricia Seppi](#)

(646) 369-0068

Remedial Project Manager

[Anne Rosenblatt](#)

(212) 637-4347

Site Location

Street Address:

INTERSECTION OF BROOKWOOD AND
ROSS ROADS
BYRAM, NJ 07874

REVISED DATA EVALUATION SUMMARY REPORT

**MANSFIELD TRAIL DUMP SITE
BYRAM TOWNSHIP, SUSSEX COUNTY, NJ**

Prepared for
U.S. Environmental Protection Agency
Region 2
290 Broadway
New York, New York 10007

2017

Region 2 RAC2
Remedial Action Contract

Contract No.: EP-W-09-002
WA #: 069-RICO-A238

**Final Human Health Risk
Assessment**

Mansfield Trail Dump – OU1
Focused Feasibility Study
Byram Township, New Jersey

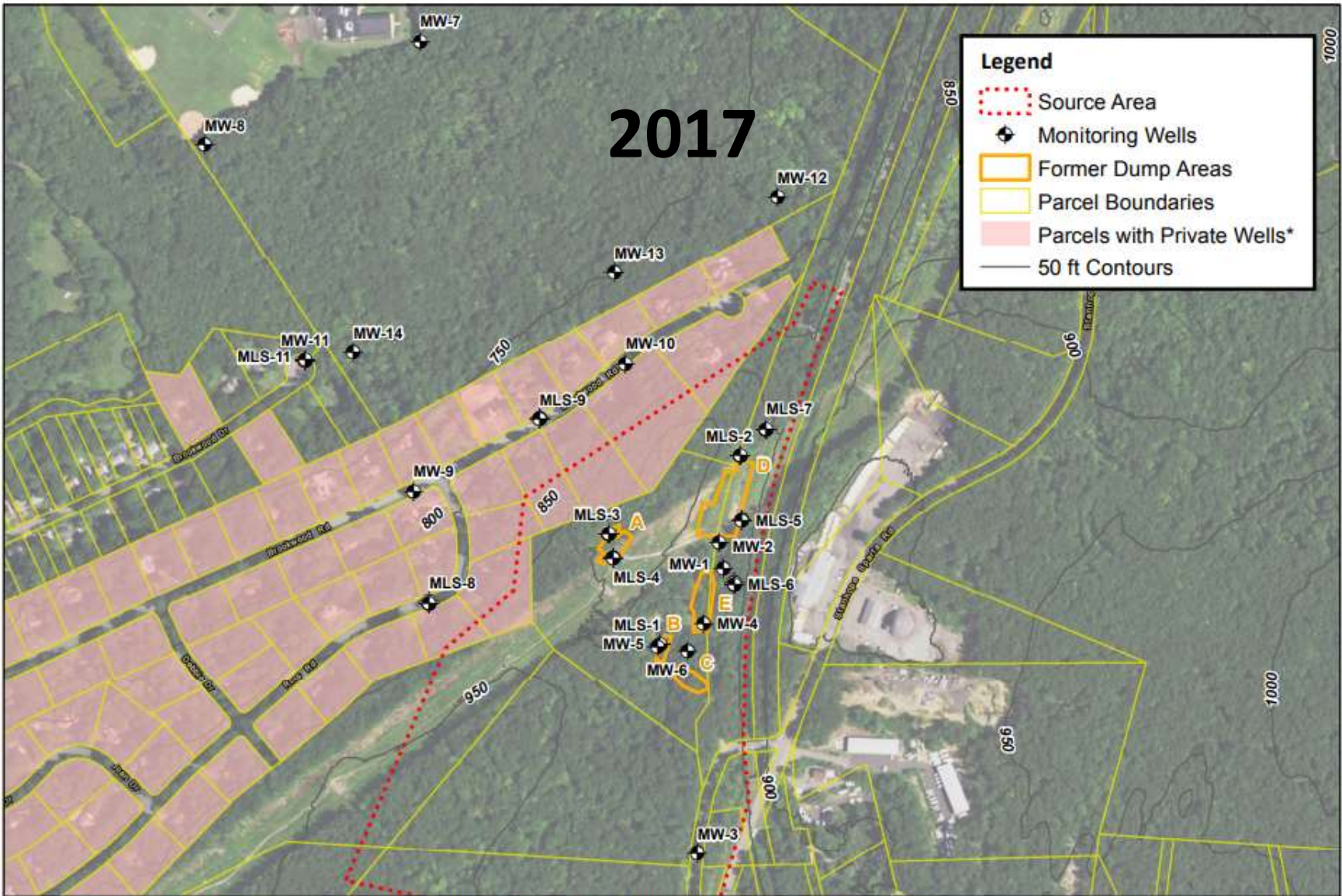
Contract No.	EP-W-II-043
Work Assignment No.	002-RICO-A238
Date Prepared	May 2016
Prepared by	EES JV
EES JV Project Manager	James P. Ricker, P.G.
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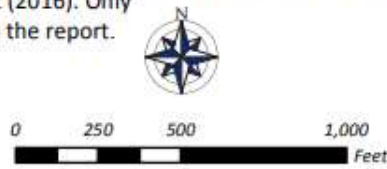
EES-043-002-0047

February 6, 2017



* As identified in the EES JV Revised Data Evaluation Summary Report (2016). Only the residential community west of the source area was evaluated in the report.

Figure 3-1
Monitoring Well Locations
Mansfield Trail Dump Site, OU1
Byram Township, NJ



2017

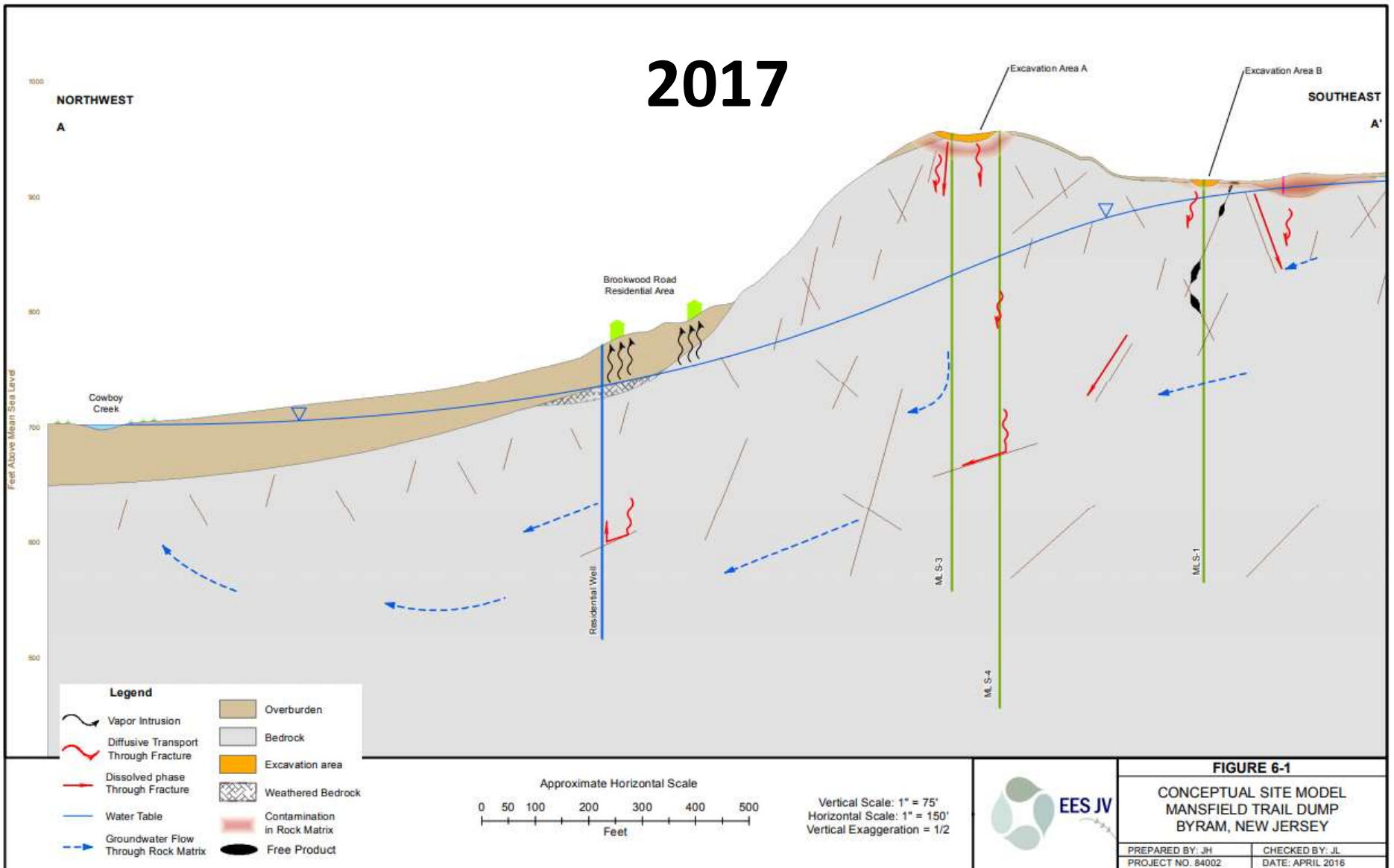


FIGURE 6-1

**CONCEPTUAL SITE MODEL
MANSFIELD TRAIL DUMP
BYRAM, NEW JERSEY**

PREPARED BY: JH
PROJECT NO. 84002

CHECKED BY: JL
DATE: APRIL 2016

2017

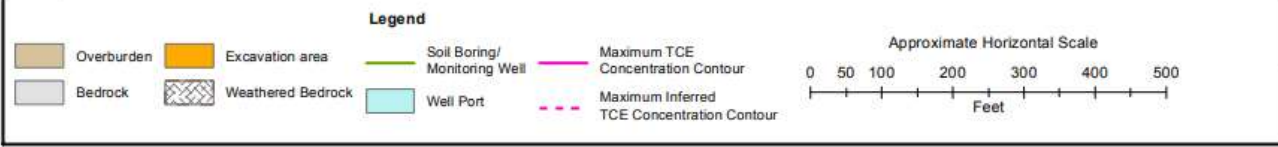
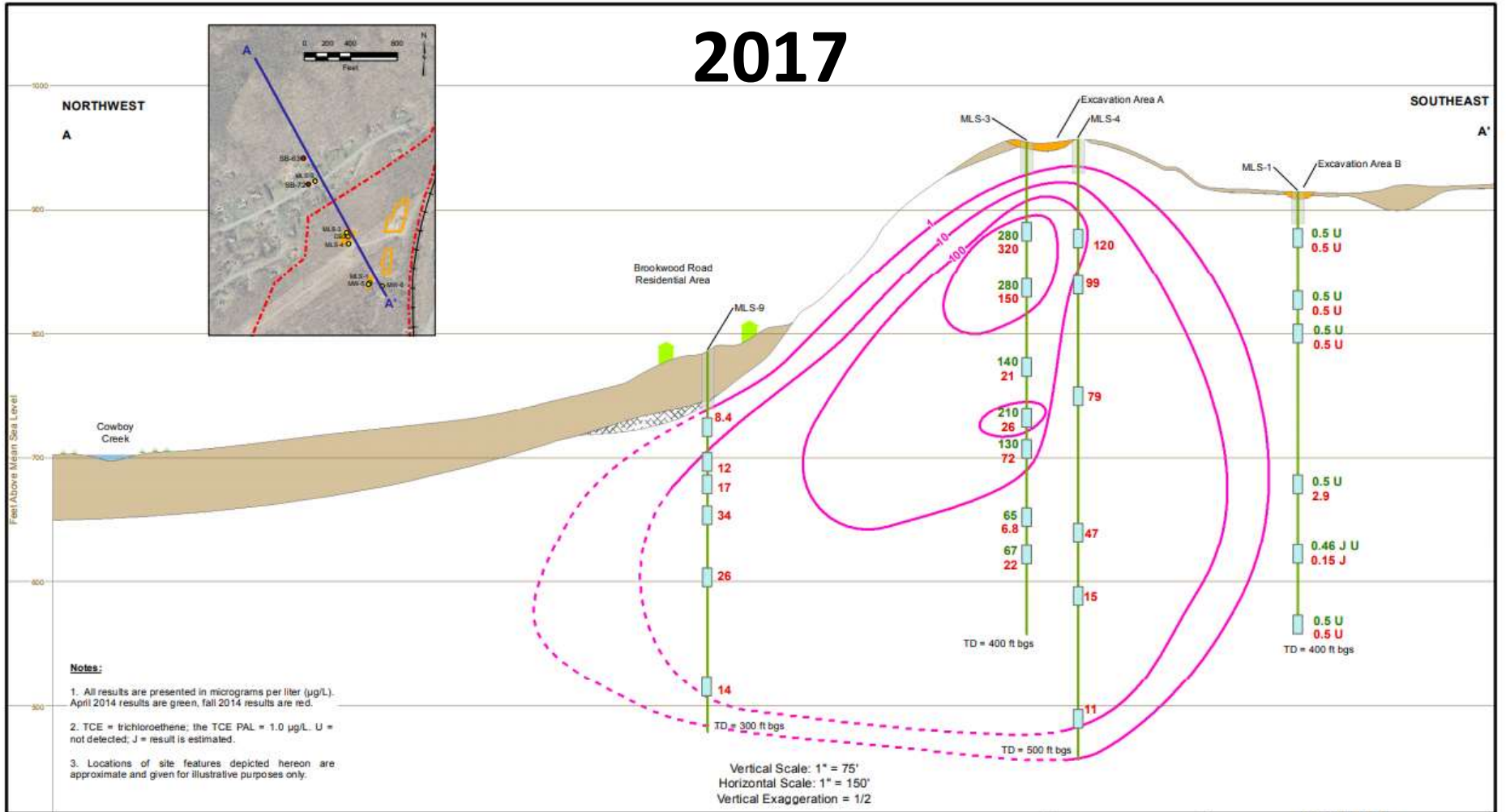


FIGURE 5-4a

TCE CONCENTRATIONS
 CROSS-SECTION A-A'
 MANSFIELD TRAIL DUMP
 BYRAM, NEW JERSEY

PREPARED BY: JH	CHECKED BY: JL
PROJECT NO. B4002	DATE: MAY 2016