

SPC 11/2011



TETRA TECH

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TECHNICAL MEMORANDUM

TO: Dale Skoff, Tetra Tech NUS

FROM: Jeffrey Benegar

DATE: October 4, 2010

RE: Area of Review/Zone of Endangerment Analysis for Bittinger #1 and #4 Well – Bear Lake Properties

EXECUTIVE SUMMARY

This technical memorandum (TM) summarizes the analytical modeling we have performed for the area of review/zone of endangerment analysis for the potential brine disposal injection wells, Bittinger #1 and #4, located in Columbus Township, Warren County, Pennsylvania. The relevant parameters for our analysis were obtained from Bear Lake Properties, LLC or estimated in the absence of any information. Our analysis is described in more detail below.

OVERVIEW AND METHODOLOGY

There are several methods proposed for calculating the zone of endangerment of an injection well. The most simplistic method is the use of a fixed radius, based on the type of injection well being permitted. Other methods involve calculation of the radius based on well and formation properties. Most regulatory agencies require the use of calculations to determine the zone of endangerment. The method used here is the graphical method first used by US EPA Region 6. It involves the calculation of the increase of pressure in the formation due to injection, then converting that pressure into equivalent feet of head. The increase in head in the formation due to injection is then compared to the equivalent head of the lowest most underground source of drinking water (USDW). When plotted graphically, the intersection of those two curves at some distance, r , determines the radius of the zone of endangerment.

The increase in pressure in the formation due to injection depends on the properties of the injection fluid and the formation, the rate of fluid injection, and the length of time of injection. The most common mathematical expression to describe this increase in pressure was developed by Matthews and Russell (1967). Matthews and Russell assume that, for a single well injecting

into an infinite, homogeneous and isotropic, non-leaking formation, the increase in pressure (Δp) can be described as:

$$\Delta p = 162.6 Q \mu / kh * [(\log(kt / \Phi \mu C r^2) - 3.23)] \text{ where:}$$

Δp = pressure change (psi) at radius, r and time, t

Q = injection rate (barrels/day)

μ = injectate viscosity (centipoise)

k = formation permeability (millidarcies)

h = formation thickness (feet)

t = time since injection began (hours)

C = compressibility (total, sum of water and rock compressibility) (psi⁻¹)

r = radial distance from wellbore to point of investigation (feet)

Φ = average formation porosity (decimal)

PARAMETERS USED IN THE ANALYSIS

The following parameters were used in the zone of endangerment analysis. There are several parameters that are unknown, including injection rate and formation permeability. For injection rate, we used the average and maximum rates expected. For permeability, we estimated a value considered representative of the average of the upper and lower range of values for this parameter.

Bittinger #1 Medina Group Well

Q = 1000 (average rate) or 2000 (maximum rate) barrels/day

t = 10 years = 87,600 hours

μ = 1 centipoise

k = 100 md

h = 30 feet

C = 3.0e-06 psi⁻¹

Φ = 0.08

Specific gravity of injectate = 1.218

Surface elevation = 1518 feet

Depth to injection formation = 4210 feet

Base of lowest most USDW = 1218 feet in elevation (depth of 300 feet below surface)

Initial pressure at top of injection formation = 128 psi

Bittinger #4 Medina Group Well

Q = 1000 (average rate) or 2000 (maximum rate) barrels/day

t = 10 years = 87,600 hours

μ = 1 centipoise

k = 100 md

h = 30 feet

C = 3.0e-06 psi⁻¹

Φ = 0.08

Specific gravity of injectate = 1.218

Surface elevation = 1561 feet

Depth to injection formation = 4285 feet

Base of lowest most USDW = 1261 feet in elevation (depth of 300 feet below surface)
 Initial pressure at top of injection formation = 128 psi

RESULTS

The Matthews and Russell equation was solved for various distances from the wellbore based on the parameters listed above. The distance between the Bittinger #1 and #4 wells is approximately $\frac{1}{4}$ mile. The Matthews and Russell equation was used to calculate the increase in pressure in the formation with only one of these wells injecting. The results are shown in Table 1 for the two scenarios simulated. This increase in pressure was added to the values of delta p and the existing pressure in the injection formation to obtain the total pressure in the formation when both wells are injecting.

Table 1. Increase in pressure in formation due to both Bittinger wells injecting.

Scenario	Increase in pressure (psi)
Q = 1000 bpd, k = 100 md	222
Q = 2000 bpd, k = 100 md	443

These values were then converted to feet of head of formation brine. The values are plotted against distance from the wellbore and are shown in Figure 1 for the Bittinger wells for the two scenarios simulated (e.g., 2 unknowns: 2 injection rates and 1 permeability value). The plot shows the calculated pressure surface within the injection formation, measured as feet of head of formation brine above the top of the injection formation. Also shown is the head of the lowest most USDW. Where the two lines intersect, the radius of the zone of endangerment can be estimated. The increase in head in the formation due to injection will remain below the elevation of the lowest most USDW assuming even worst-case conditions (maximum injection rate of 2000 bpd).

As indicated above, certain input parameters (e.g., permeability) were approximated due to lack of site-specific data. In order to validate the findings of the analysis presented above, Bear Lake Properties plans to monitor fluid levels in the monitoring wells designated below on a semiannual basis. The proposed monitoring wells were all completed in the Medina Group rocks, as were the two proposed injection wells.

Injection Well	Monitoring Well	Approximate Distance and Direction From Injection Well
Bittinger #1	Bittinger #4 (unless injection also being performed in Bittinger #4)	0.25 mi to the south
	R. Trisket 2	0.34 mi to the west
	Smith/Ras Unit 1	0.29 mi to the east
Bittinger #4	Bittinger #1(unless injection also being performed in Bittinger #1)	0.25 mi to the north
	R. Trisket 1	0.33 mi to the west
	Joseph Bittinger 2	0.37 mi to the southeast

Should fluid levels in any of the monitoring wells rise to within 100 ft of the lowest most USDW (indicated above), then injection would cease, EPA notified and steps taken to adjust the injection rate to prevent fluid levels from rising to within 100 ft of the lowest most USDW in any of the monitoring wells.

CONCLUSIONS

Our analysis of the area of review/zone of endangerment for the Bittinger #1 and #4 wells injecting together is based on a methodology typically used by US EPA. Based on the results, we believe the wells are excellent candidates for use as brine disposal wells. The analysis indicates that the increase in head in the formation due to injection will remain below the elevation of the lowest most USDW. The standard fixed radius of 1/4 mile can be used for the area of review/zone of endangerment for the Bittinger #1 and #4 wells. As indicated above, Bear Lake Properties plans to perform monitoring of nearby wells to validate the results of this analysis.

REFERENCES

Matthews, C.S., Russell, D.G., (1967) Pressure Buildup and Flow Tests in Wells, SPE Monograph Series, Volume 1, New York.

FIGURES

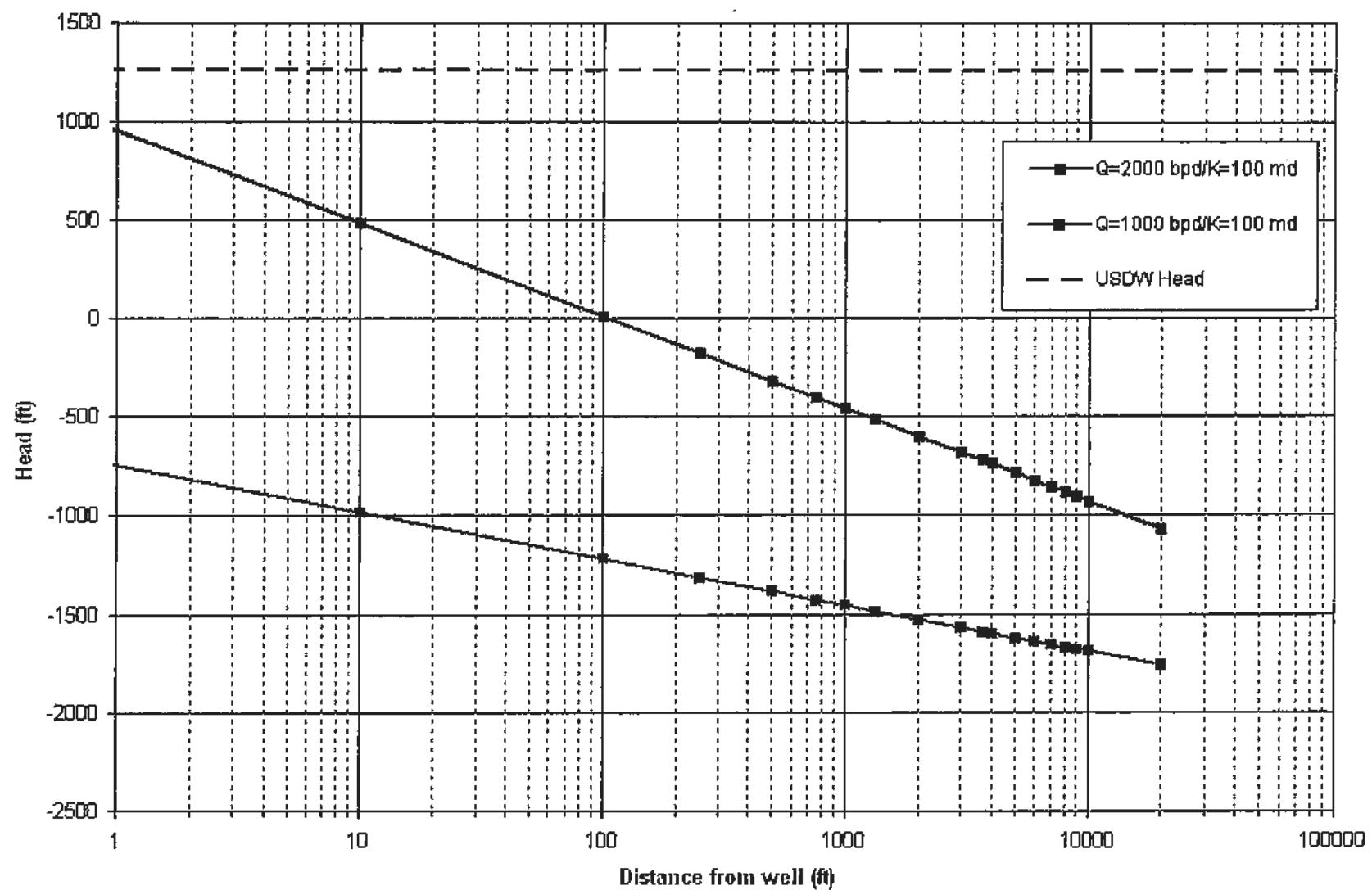


Figure 1. Feet of head of injection formation and USDW vs. distance from the well for Bittinger #1 and #4 well when both wells are injecting.



TETRATECH, INC.

AREA OF REVIEW
WELLS WITHIN 0.25 MILES

Bittinger Area; Columbus Twp; Warren County, PA
Wells w/in 0.25 mile radius of Bittinger #4

	API #	TD	Drilling Completed	Last Csg	Csg depth	Completion	Comments
Proposed Injection and Monitoring Wells							
Bittinger #1	123-33914	4467	12/29/1983	4.5	4416	Perf'd & Frac'd: 4210-4327'	Subject of separate UIC Class II permit application
Bittinger #4	123-39874	4496	8/15/1987	4.5	4455	Perf'd & Frac'd: 4285-4302'; & 4352-4365'	
Water Wells							

FIGURES

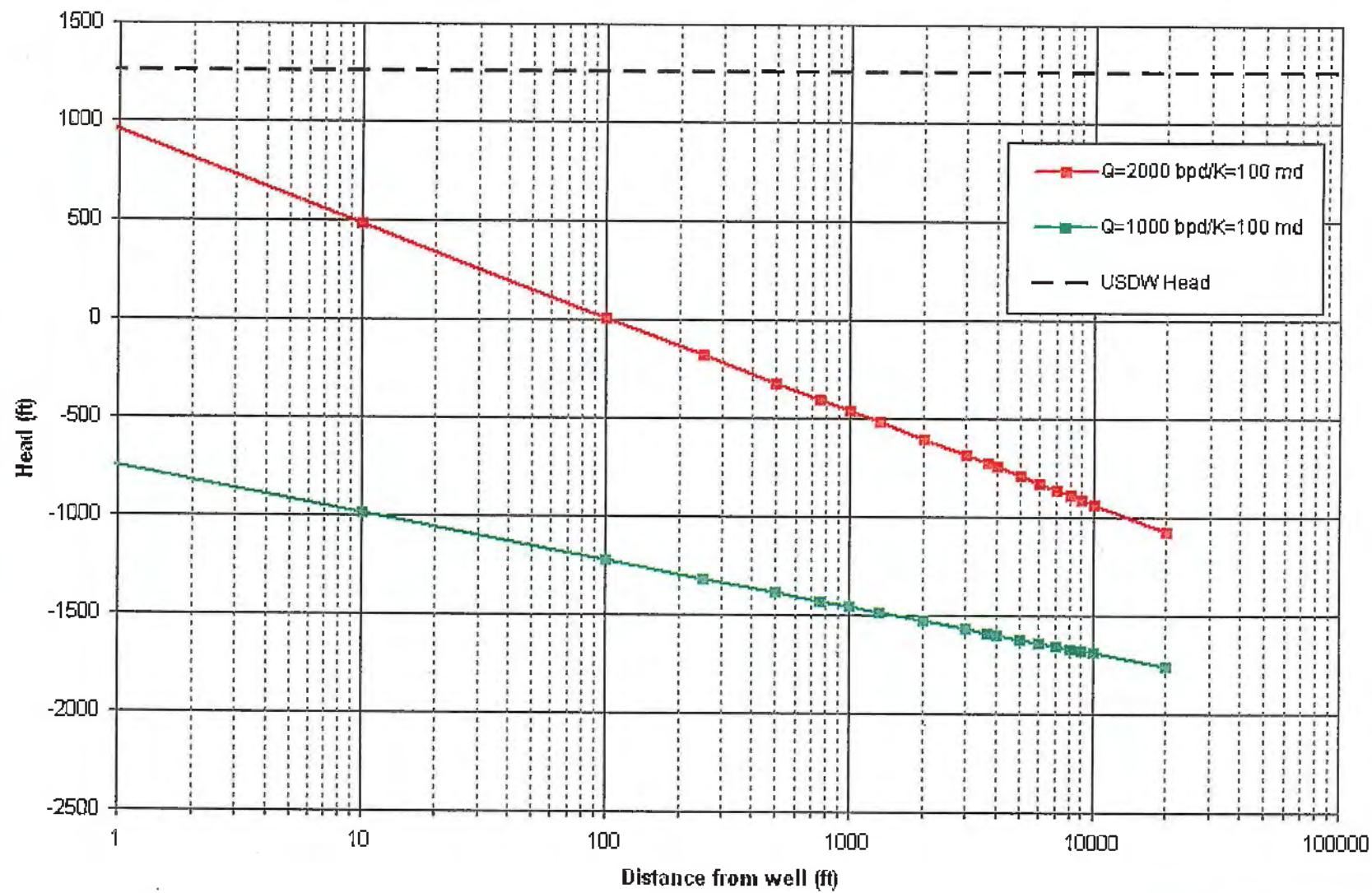


Figure 1. Feet of head of injection formation and USDW vs. distance from the well for Bittinger #1 and #4 well when both wells are injecting.



TETRATECH, INC.

AREA OF REVIEW
WELLS WITHIN 0.25 MILES

Bittinger Area; Columbus Twp; Warren County, PA

Wells w/in 0.25 mile radius of Bittinger #1

	API #	TD	Drilling Completed	Last Csg	Csg depth	Completion	Comments
Proposed Injection and Monitoring Wells							
Bittinger #1	123-33914	4467	12/29/1983	4.5	4416	Perf'd & Frac'd: 4210-4327'	
Bittinger #4	123-39874	4496	8/15/1987	4.5	4455	Perf'd & Frac'd: 4285-4302'; & 4352-4365'	Subject of separate UIC Class II permit application
Existing / Former Oil and Gas Wells							
Bittinger #4	123-39874	4496	8/15/1987	4.5	4455	Perf'd & Frac'd: 4285-4302'; & 4352-4365'	Subject of separate UIC Class II permit application
Water Wells							
None							

Section 2

Area of Review

According to available records in the area, there are no intake or discharge structures, hazardous waste treatment, storage, or disposal facilities, mines, or quarries within one mile of the Bittinger #1 well. An intermittent unnamed tributary (UNT) to Tamarack Swamp is located just south of the Bittinger #1 well. Tamarack Swamp is located approximately 0.75 to 1 mile west-southwest, Brokenstraw Creek is located approximately 0.75 miles northwest, and an UNT to Pine Valley Creek is located approximately 0.75 miles southeast of Bittinger #1.

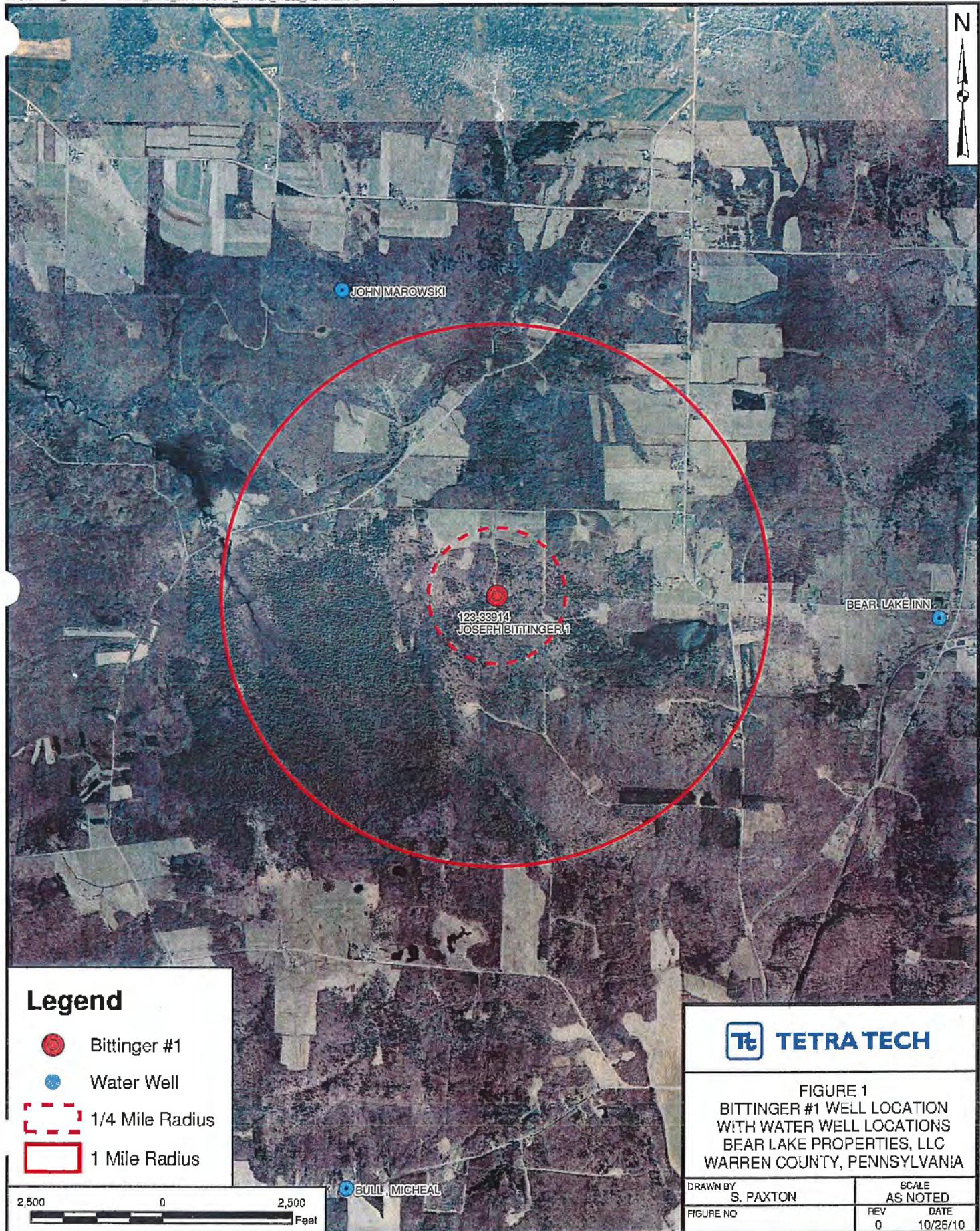
According to publicly available records, there are no groundwater wells within $\frac{1}{4}$ mile of the Bittinger #1 well. The nearest groundwater well is located approximately $1 \frac{1}{4}$ mile to the northwest. The only oil and gas well located within $\frac{1}{4}$ mile of the Bittinger #1 is the Bittinger #4 located approximately $\frac{1}{4}$ mile to the north, which is also a proposed injection well and the subject of a UIC Class II Well permit application.

The names and addresses of residents located within $\frac{1}{4}$ mile of the proposed injection well are provided in Appendix B.

AREA OF REVIEW MAPS

GROUNDWATER WELLS

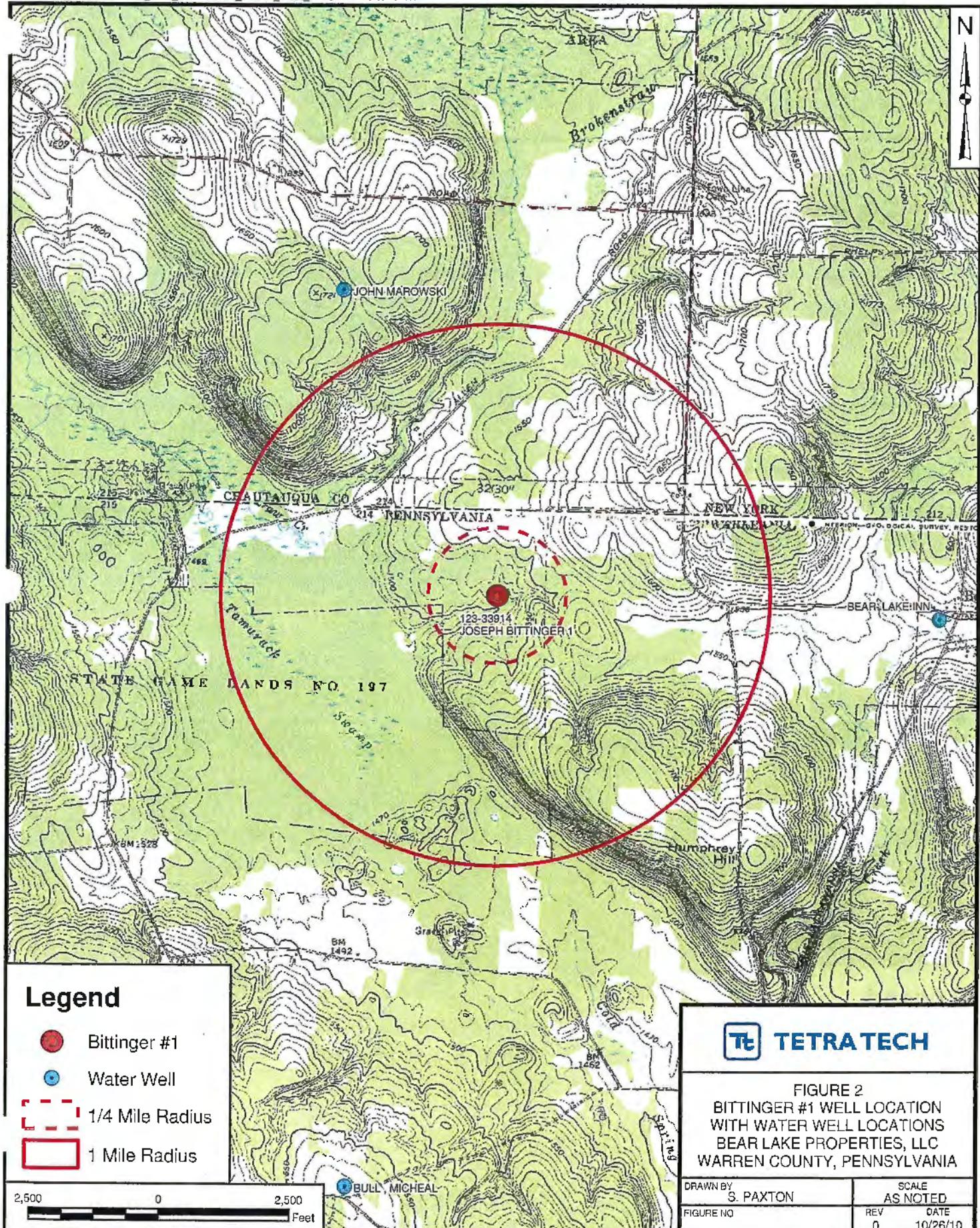
P:\GIS\BEAR_LAKE\MXD\BEAR_LAKE_BITTINGER#1_WATER_WELL_AERIAL.MXD 10/28/10 TW

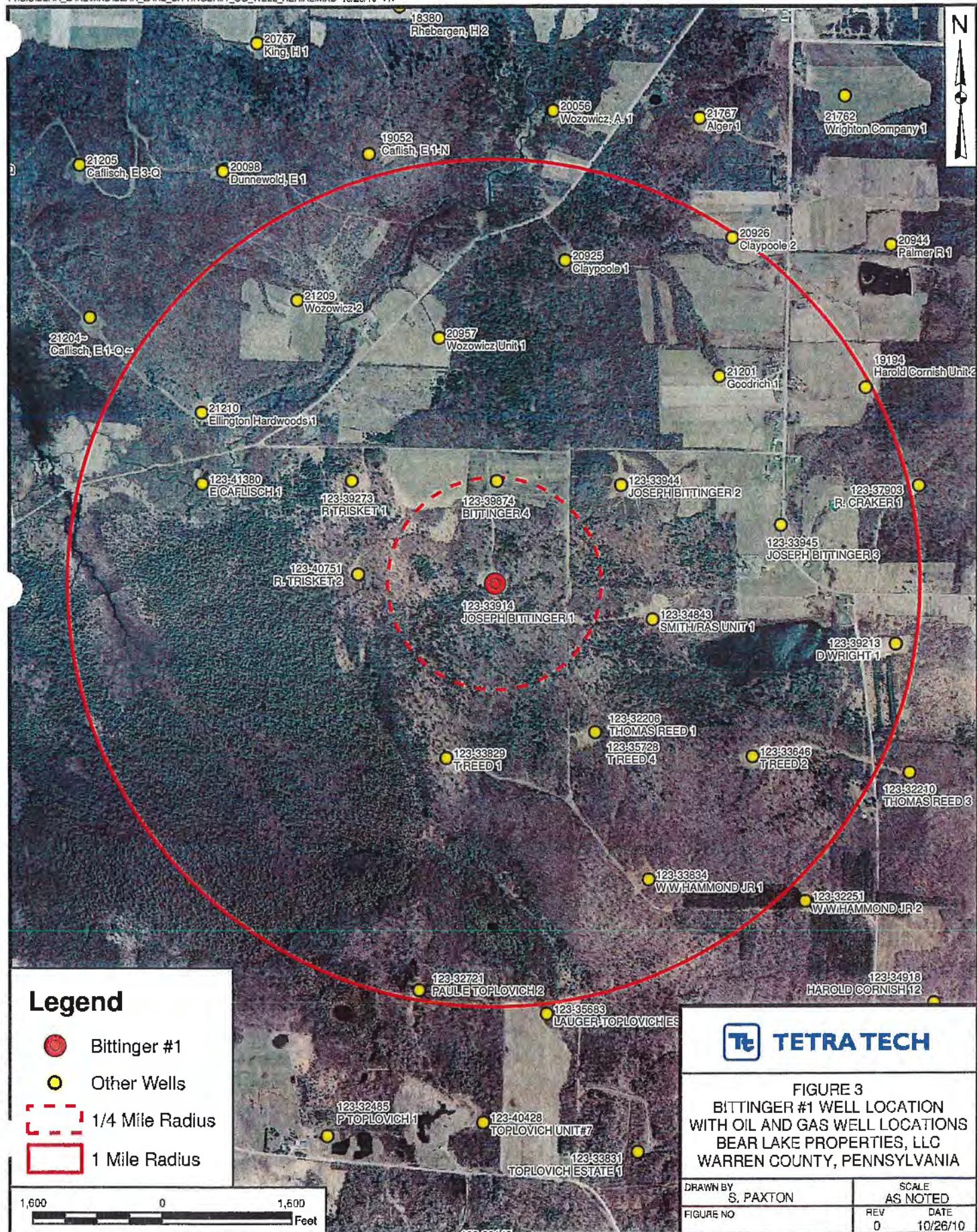


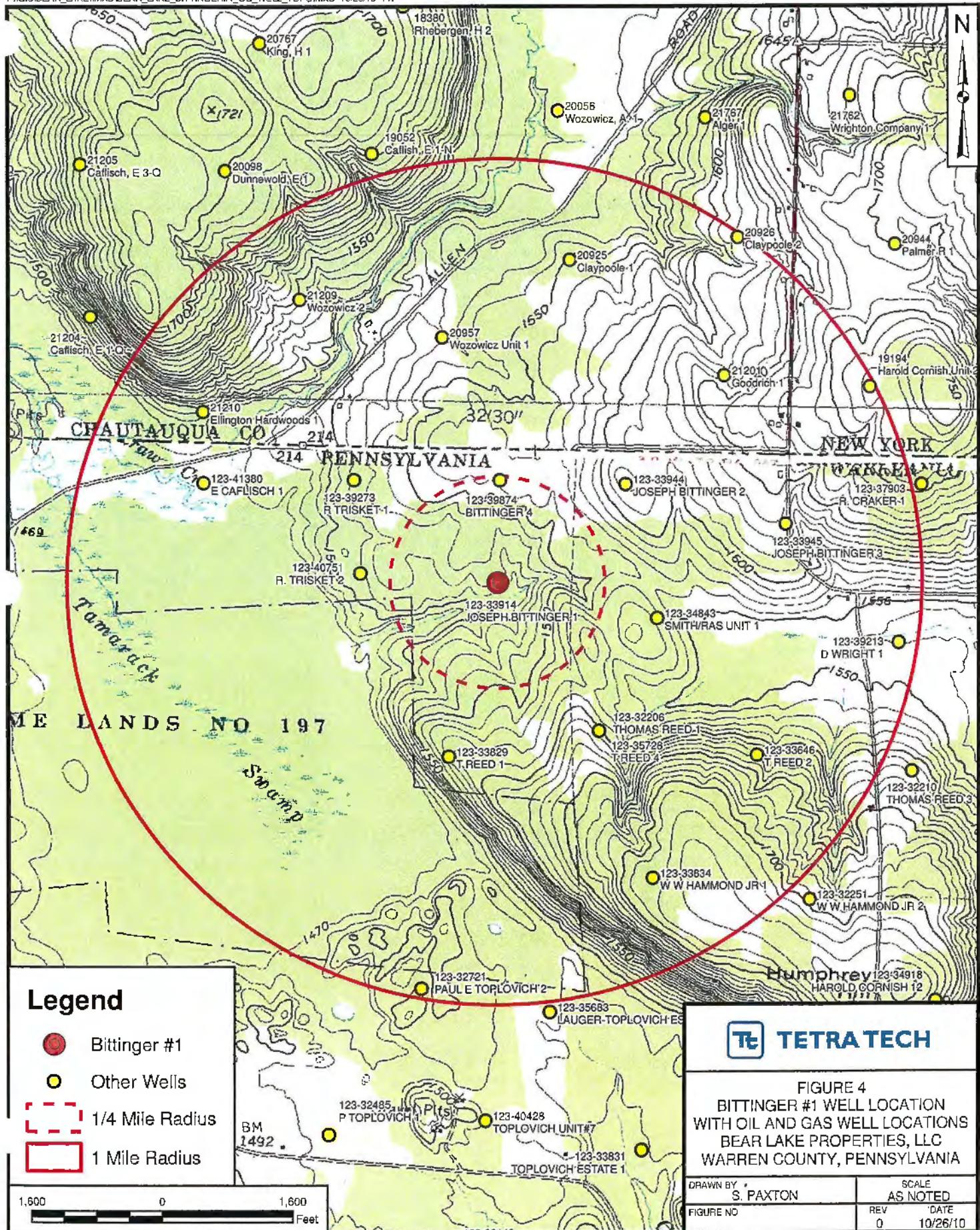
AREA OF REVIEW MAPS

OIL AND GAS WELLS

P:\GIS\BEAR_LAKE\WDX\BEAR_LAKE_BITTINGER#1_WATER_WELL_TOPO.MXD 10/26/10 TW







Underground Sources of Drinking Water – Bittinger No. 1/Columbus Township,
Warren County, PA

The site lies within the Glaciated Plateau section of the Appalachian Plateaus Physiographic province. Both unconsolidated glacial units and bedrock are used for potable water. The uppermost unit at the site is mapped as Wisconsin age glacial kame deposits. Kame deposits consist primarily of sand and gravel interbedded with minor amounts of silt and clay. The well log for Bittinger No. 1 indicates that unconsolidated gravel is present from the surface to a depth of 36 feet below ground surface. (Pennsylvania Topographic and Geologic Survey, 1959)

The uppermost bedrock beneath the site is mapped as the Devonian age Venango formation. The Venango formation consists of interbedded pebble conglomerate, crossbedded sandstone, siltstone, and shale. This unit is up to 330 feet thick in Venango County; however, only a portion of the unit is present in the site area. This unit is used as an aquifer throughout Warren County. The well log for Bittinger No. 1 indicates that Devonian age shale is present from 37 ft to a depth of 2,679 ft below ground surface. This is believed to include the Venango Formation, the Chadakoin formation, and the underlying Bradford Group. The Bittinger No. 1 well log indicated that salt water was encountered at a depth of 3,935 feet below ground surface. Wells deeper than 100 feet deep usually encounter salt water, which is supported by the generally shallow well depths in Columbus Township. (PADER, 1982, US Geologic Survey, 2007)

The Devonian age Chadakoin formation underlies Venango formation and consists of fine-grained marine clastics (siltstone and shale) and includes a purplish pink sequence which is often used as a marker unit. This unit is up to 450 thick in Warren County.

The Pennsylvania Geologic Survey "Ground Water Inventory System" (GWIS) database was accessed to determine the sources of groundwater sources in the site area. This data base did not contain any groundwater wells within a one-mile radius of Bittinger #1 well. Although there are no wells listed, the well reporting requirement was established in 1968 is not considered to be a complete record of water wells and other wells may be present. (Pennsylvania Topographic and Geologic Survey, September 15, 2010)

To better understand the underground sources of drinking water, the GWIS was searched for all wells within Columbus Township. Available well records for wells in Columbus Township are provided in Appendix A. The GWIS indicated that there are 35 recorded water wells in Columbus Township. The deepest well is listed as 130 feet deep, with reported well depths ranging from 42 to 130 feet deep. (Pennsylvania Topographic and Geologic Survey, September 20, 2009)

Based on the available information, the glacial units and the top 100 feet of bedrock is considered as the underground sources of drinking water in the site area. The well logs indicate that the glacial material is approximately 37 feet thick beneath the site. Freshwater is expected

to be encountered to a depth of approximately 150 feet with increasing salinity beyond a depth of 150 feet. Bittinger No. 1 has surface casing to a depth of 401 feet below ground surface, providing a buffer of approximately 250 beyond the base of the underground sources of drinking water based on the well data in Columbus Township (maximum well depth of 130 feet) and the references indicating brine being encountered at depths over 100 feet within the bedrock units. Production casing extends several thousands of feet below the drinking water sources and the injection interval is at a depth from 4150 to 4330 feet below the ground surface.

For the purpose of this application, the depth of the deepest well in the area 130 feet (it is believed that the generally shallow well depth in the area was related to water quality issues based on the available literature) was doubled and rounded upward to the nearest 100 feet, providing a conservative maximum depth estimate of the underground source of drinking water of 300 feet.

References:

Pennsylvania Topographic and Geologic Survey, 1959. "Glacial Geology of Northwestern, PA." Bulletin G 32.

Pennsylvania Topographic and Geologic Survey, 1981. "Atlas of Preliminary Quadrangle Maps of Pennsylvania, PA." Map 61.

PADER, 1982. "Engineering Characteristics of the Rocks of Pennsylvania". Environmental Geology Report 1.

Pennsylvania Topographic and Geologic Survey, September 15/20, 2010. "Ground Water Inventory System". www.dcnr.state.pa.us/topogeo/groundwater/PAGWIS

US Geologic Survey, 2007. "Ground-Water Resources and the Hydrologic Effects of Petroleum Occurrence and Development, Warren County, Northwestern Pennsylvania." Scientific Investigations Report 2006-5263.

UNDERGROUND SOURCES OF DRINKING WATER
GROUNDWATER WELLS WITHIN 1 MILE

Bittinger Area; Columbus Twp; Warren County, PA

Wells w/in 1 mile radius of Bittinger #1

Section 5

Injection and Confining Zones

The well is designed to inject into the Grimsby and Whirlpool sandstone units of the Medina formation, with injection zone perforations at a depth of 4,210 to 4,327 feet below ground surface. The Medina is a depleted reservoir in this area.

As seen on the generalized stratigraphic column (attached), most of the geologic "groups" and "formations" overlying the Medina can be considered confining units totaling approximately 1,800 feet. Although many of these units are predominantly shale, they also contain reservoir rock and are shown with shading in confining unit column. Therefore, the Lockport and the Salina are seen as the most significant confining units and are a combined 520 feet thick in the site area. But as indicated these units provide only a portion of the confining capacity and there are numerous other units that provide further protection.

Also attached are the following:

- Bittinger #1 completion record and geophysical log,
- Maximum Injection Pressure (MIP) calculations based on Instantaneous Shut-In Pressure (ISIP) data for two nearby wells (R. Trisket #1 and #2),
- Bittinger #4 completion record,
- R. Trisket #1 and #2 treatment reports.

GEOLOGIC DATA
GENERALIZED STRATIGRAPHIC COLUMN

Generalized Stratigraphic Column
Bittinger No 1 and Bittinger No. 4 Area
Warren County, PA

Age	Group	Formation	Predominant Rock Type	Total Depth to Base(Feet)	Thickness Feet	Confining Zone
Glacial Units				18	18	
Upper Devonian	Venango		Shale/sandstone			
Upper Devonian		Chadakoin	Shale			
Upper Devonian	Bradford		Shale			
Upper Devonian	Elk		Shale			
Upper Devonian		Java	Shale			
Upper Devonian		West Falls	Shale			
Upper Devonian		Sonyea	Shale			
Upper Devonian		Genesee	Shale			
Upper Devonian		Tully Limestone	Limestone	2848	107	
Upper Devonian	Hamilton	Mahantango	Shale, some sandstone	3018	170	
Upper Devonian	Hamilton	Marcellus Shale	Shale			
Middle Devonian		Onondaga	Limestone	3182	164	
Lower Devonian		Bois Blanc/Oriskany Sandstone	Sandstone	3211	29	
Upper Silurian		Bass Islands	Dolomite	3547	336	
Upper Silurian		Salina	Evaporites/Dolomite	3896	349	
Upper Silurian		Lockport Dolomite	Dolomite	4067	171	
Lower Silurian	Clinton		Sandstone	4189	122	
Lower Silurian		Medina, including the Grimsby and Whirlpool Sandstones	Sandstone/Shale	4367	178	

Notes

- = Black shading indicates that this unit is considered to be a confining zone
- = Diagonal shading indicates that this unit is a confining unit that also contains producing zones within it
- = No shading indicates that this unit is a producing zone and is not considered to be a confining unit

GEOLOGIC DATA

MAXIMUM INJECTION PRESSURE CALCULATIONS

**Maximum Injection Pressure (MIP) Calculations for Bear Lake Properties Wells
(Bittinger #1 and Bittinger #4)**

1) Frac Gradient Based on Trisket #1 and Trisket #2 Wells

R. Trisket #1

$$FG = [ISIP + (.433 \times SG \times D)] / D$$

Where:

ISIP = 2150 psi

SG = 1.218

D = 4253

R. Trisket #2

$$FG = [ISIP + (.433 \times SG \times D)] / D$$

Where:

ISIP = 2100 psi

SG = 1.218

D = 4254 ft

Well	ISIP (psi)*	Hydrostatic		Fracture Gradient	
		Factor (psi/ft)	SG	D (ft)	(psi/ft)
R. Trisket #1	2150	0.433	1.218	4253	1.033
R. Trisket #2	2100	0.433	1.218	4254	1.021
Average Frac Gradient				1.027	

2) Maximum Injection Pressure (MIP) Using Average Frac Gradient From Trisket Wells

$$MIP = [FG - (.433 \times SG)] \times D$$

Bittinger #1 Bittinger #4

Depth:

Top Perf	4210	4285
Bottom Perf	4327	4365
Difference	117	80
Mid-Point	4269	4325

	Hydrostatic	Fracture Gradient			MIP (Surface)
		Factor (psi/ft)	SG	D (ft)	
Bittinger #1	-	0.433	1.218	4210	2103
Bittinger #4	-	0.433	1.218	4285	2141

GEOLOGIC DATA

R. TRISKET #2 WELL DATA

HILLBURTON SERVICES

HILLBURTON
DIVISION

Pittsburgh, Pa

HILLBURTON
LOCATION

Bradford, Pa

HYDRAULIC STRETCHING SERVICE TREATING REPORT

R. TRISKETT #2

BILLED ON
TICKET NO. 996925-7

Columbus

Sec. _____ Twp. _____
 Formation Name _____ Type _____
 Formation Thickness _____ From _____ To _____
 Initial Prod: Oil _____ Bpd. Water _____ Bpd. Gas _____ Mcfd.
 Current Prod: Oil _____ Bpd. Water _____ Bpd. Gas _____ Mcfd.
 Stimulation Tool # _____ Mandrel Size _____ Extensions _____ in.
 Fracturing Type _____ Set At _____
 Bottom Hole Temp. _____ RBP@ _____
 Job Or Flange _____ Pbd. _____

WELL DATA

	WELL NUMBER	County	WARRIOR	State	Pa
CASING	N	10.5	4 1/2	0	4389
LINER					
TUBING					
OPEN HOLE					
PERFORATIONS		,39	4201	4307	8
PERFORATIONS					
PERFORATIONS					

MATERIALS

Water Fluid H2O Density 8.33 Lb./Gal. ⁰ API
 Oil Fluid H2O Density 8.3 Lb./Gal. ⁰ API
 Proppant Type Sand Size 80/100 Lb. 162,000
 Proppant Type Sand Size 20/40 Lb. 10,000
 Radioactive Tracer _____ Carrier _____ Units-MCI _____
 Fracturing Agent Type _____ Gal. _____ @ _____ /1000 Gal.
 Fracturing Agent Type _____ Gal. _____ @ _____ /1000 Gal.
 Acid Loss Type _____ Gal.-Lb. _____ @ _____ /1000 Gal.
 Stabilizing Agent _____ Gal.-Lb. _____ @ _____ /1000 Gal.
 Stabilizing Agent LGC-IV Gal.-Lb. 280 @ _____ /1000 Gal.
 Fracker Type GBW-30 Gal.-Lb. 4 @ _____ /1000 Gal.
 Fracker Type _____ Gal.-Lb. _____ @ _____ /1000 Gal.
 Carrier _____ Gal.-Lb. _____ @ _____ /1000 Gal.
 Carrier _____ Gal.-Lb. _____ @ _____ /1000 Gal.
 Filter Type _____ Gal.-Lb. _____ @ _____ /1000 Gal.
 Filter Type Citric Acid Gal.-Lb. 200 @ _____ /1000 Gal.
 Crosslinker _____ Gal.-Lb. _____ @ _____ /1000 Gal.
 Microfoamer AQF-4 Gal.-Lb. 38 @ _____ /1000 Gal.
 Quality Control Clusta XP Gal.-Lb. 10 @ _____ /1000 Gal.
 Filter Citric Acid Gal.-Lb. 80 @ _____ /1000 Gal.
 Friction Reducer _____ Gal.-Lb. _____ @ _____ /1000 Gal.
 Impact Balls _____ Qty. _____ Size _____ S.G. _____
 Filter _____

JOB DATA

CALLED OUT DATE	ON LOCATION DATE	JOB STARTED DATE	JOB COMPLETED DATE
01/07/90	01/07/90	01/07/90	01/07/90

TIME 0730 TIME 1200 TIME 1400 TIME 1530

PERSONNEL AND SERVICE UNITS

NAME	UNIT NO. & TYPE	LOCATION
<u>B. Jackson</u> 46175		
<u>C. Thomas</u> 69581	3298 14440	
<u>R. Wheeler</u> 871697	2683 44440	
<u>K. Thompson</u> 3997 mru		
<u>L. Colts</u> 3892 FRC		
<u>Caldwell</u> C6159	3305 SBP	
<u>M. English</u> D7811	3302 580	
<u>J. Piscarella</u> D7783	9911 TD	
<u>J. Gould</u> D7896	3905 460	
		<u>TBP Cartland</u>

ACID DATA

Acid Type _____ % _____ Gal.-Bbl. _____
 Acid Type _____ % _____ Gal.-Bbl. _____
 Fracturing Agent Type _____ Gal. _____ @ _____ /1000 Gal.
 Fracturing Agent Type _____ Gal. _____ @ _____ /1000 Gal.
 Quality Control Type _____ Gal.-Lb. _____ @ _____ /1000 Gal.
 Quality Control Type _____ Gal.-Lb. _____ @ _____ /1000 Gal.
 Corrosion Inhibitor _____ Gal.-Lb. _____ @ _____ /1000 Gal.
 Corrosion Inhibitor _____ Gal.-Lb. _____ @ _____ /1000 Gal.
 Scaling Inhibitor _____ Gal.-Lb. _____ @ _____ /1000 Gal.
 Anti-Sequester _____ Gal.-Lb. _____ @ _____ /1000 Gal.
 Friction Reducer _____ Gal.-Lb. _____ @ _____ /1000 Gal.

DEPARTMENT STIM

DESCRIPTION OF JOB water Frac

JOB DONE THRU: TUBING CASING ANNULUS TSG/ANN.

PRESSES IN PSI

Displacement 3601
 1000 ft. 3367 Maximum 4600
 Fracture Gradient 3601
 2100 5 Min. 2180 10 Min. 2180 15 Min. 2180

SUMMARY

VOLUMES

Preflush: Bbl.-Gal. _____ Type _____
 Load & Bkdn: Bbl.-Gal. 5318 Pad: Scf-Bbl.-Gal. _____
 Treatment: Bbl.-Gal. 20480 Disp: Bbl.-Gal. 2860
 Gas Assist _____ Tons-Scf _____ @ _____ Scf/Bbl.
 Foam Quality _____ % Total Volume Foam _____ Bbl.-Gal.
 Total Volume: Bbl.-Gal. 28604 Fluid-Foam _____

Hydraulic Horsepower 1500 Available 2760 Used 1480
 Rating 16.7 Displ. 16.7 Overall 16.7

REMARKS

CUSTOMER U.S. ENERGY

LEASEE K. TRISKETT

WELL NO. #2

JOB TYPE Water Frac

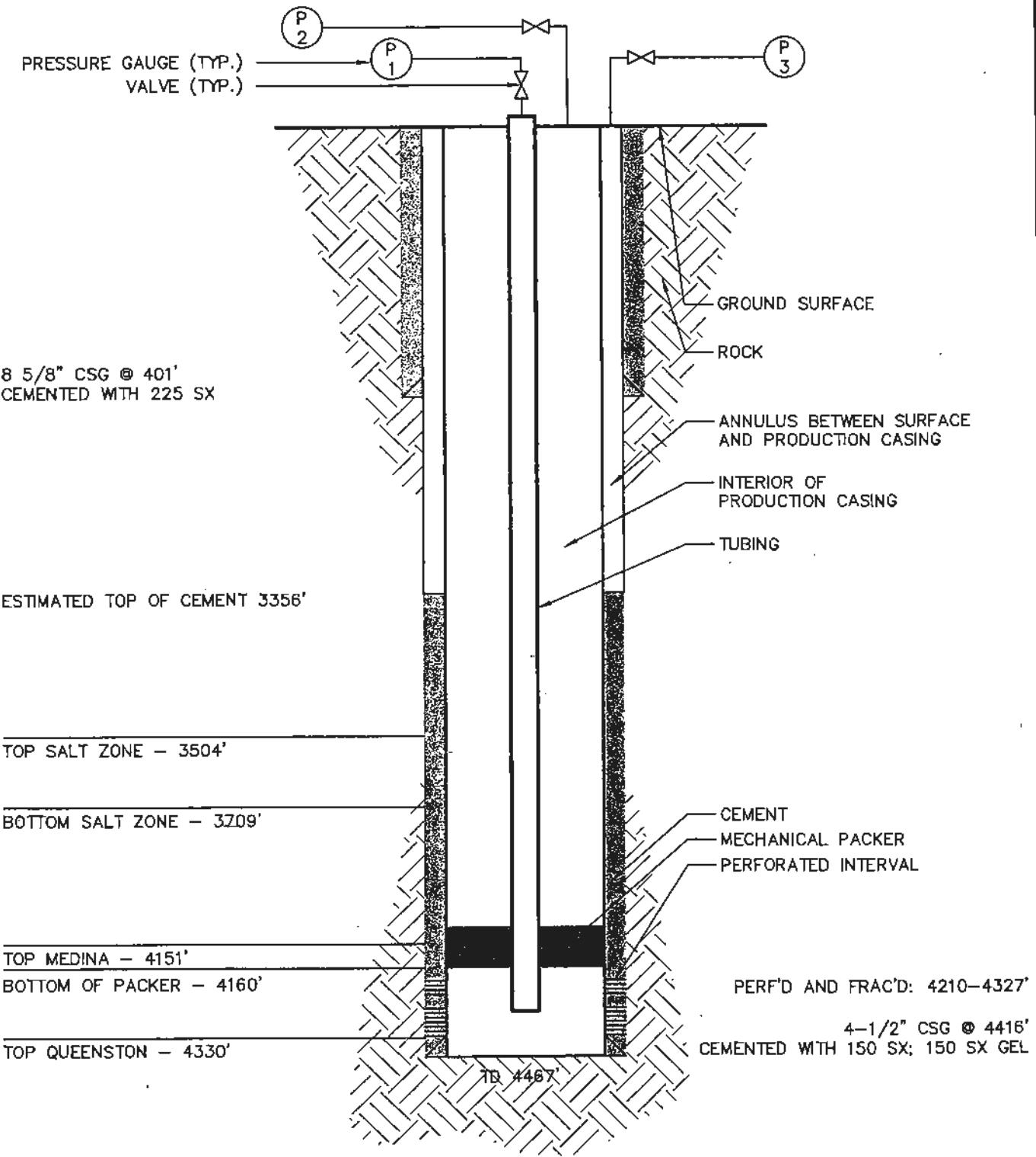
DATE 01/07/90

**ALLIBURTON SERVICES
JOB LOG**

BRM 2013 R-2

WELL NO. #2 LEASER P. Trisket TICKET NO. 886925-7
CUSTOMER U.S. Energy PAGE NO. 1
JOB TYPE water well DATE 01/05/90

CHART NO.	TIME	RATE (BPM)	VOLUME (BBL) (GAL)	PUMPS		PRESSURE (PSI)		DESCRIPTION OF OPERATION AND MATERIALS
				T	C	TUBING	CASING	
								Soft Key Meeting
410				4				Pick up Pump
12 1/2				2				4176 Tcs + Lines
14		2462		4				570 Load Hole
30 3/4				4				3367 Pad
35 1/4		2886		1				3868 Start Sand 80/100 1PPG
43	↑	5000		1				3830 Inc Sand 80/100 2PPG
46 3/4		7630		1				3206 Start Sand 80/100 2PPG
59 1/2		5000		1				3581 Inc Sand 3PPG
1508	16.1	15000		1				3595 Inc Sand 4PPG
12		17856		1				3523 Sand on Bottom
15 3/4		20450		1				3439 Finish Sand
19 1/2	↓	2886		1				380 Finish Flush
18 1/2						2100		ESIP
24 1/2						2180		5 min



TETRA TECH

WWW.TETRATECH.COM

661 ANDERSEN DRIVE - FOSTER PLAZA 7
PITTSBURGH, PA 15220
T: (412) 921-7090 | F: (412) 921-4040

BEAR LAKE PROPERTIES, LLC

BITTINGER #1
INJECTION WELL CONFIGURATION
SCALE: NOT TO SCALE

DATE:	9-30-10
PROJECT NO.:	112C02984
DESIGNED BY:	
DRAWN BY:	CK
CHECKED BY:	
SHEET:	1 OF 1
COPYRIGHT TETRA TECH INC.	
FIGURE	

Appendix A

Appendix A contains well records and information for groundwater wells in the area surrounding Bittinger No. 1. There are no groundwater wells located within 1 mile of the Bittinger No. 1 well, as listed in the following table. Well records for all groundwater wells located within Columbus Township, Warren County, Pennsylvania are provided in Appendix A-1.

APPENDIX A

GROUNDWATER WELLS WITHIN 1 MILE

Bittinger Area; Columbus Twp; Warren County, PA

Wells w/in 1 mile radius of Bittinger #1

Exhibit 2
continues

APPENDIX A-1

**PENNSYLVANIA GROUNDWATER INFORMATION SYSTEM
WELL RECORDS WITHIN COLUMBUS TOWNSHIP, PA**

PA Topographic & Geologic Survey

PaGWIS

SELECTED WELLS

[Menu](#)[New Selection](#)[Email comments to Topo Geo.](#)[Create List](#)

You have selected 35 Well(s). To create a comma separated list of all these wells, click **Create List**. If you want to limit the list, place check marks next to the wells you want to have included, and then click **Create List**.

[Next Page](#)

Page 1 of 2

Record	PA Well ID	Driller	Driller Well ID	Date Drilled	Owner	County	Municipality	Image
<input type="checkbox"/> 1	405210	ELIASON WATER WELL DRILLING		2/7/1994		WARREN	COLUMBUS TWP.	View Image
<input type="checkbox"/> 2	33539	ALFRED L BURCH		5/1/1966	ALLEN, BRUCE C	WARREN	COLUMBUS TWP.	No Image
<input type="checkbox"/> 3	405201	MCCRAY WELL DRILLING		10/1/1998	AYERS	WARREN	COLUMBUS TWP.	View Image
<input type="checkbox"/> 4	405194	CLEARWATER DRILLING COMPANY		11/18/2002	BECKWITH	WARREN	COLUMBUS TWP.	View Image
<input type="checkbox"/> 5	33614	YORK WATER WELL DRILLING CO INC		6/1/1979	BEDJORSKI, C	WARREN	COLUMBUS TWP.	No Image
<input type="checkbox"/> 6	33629	ACKERMAN DRILLING		10/1/1980	BULL, MICHEAL	WARREN	COLUMBUS TWP.	No Image
<input type="checkbox"/> 7	405195	SAXTON WELL SERVICE, INC.		1/1/2002	BYERS	WARREN	COLUMBUS TWP.	View Image
<input type="checkbox"/> 8	405213	MCCRAY WELL DRILLING		7/1/1990	CORTER	WARREN	COLUMBUS TWP.	View Image
<input type="checkbox"/> 9	33531	JOHNSON'S DRILLING		4/1/1986	EASTMAN, S	WARREN	COLUMBUS TWP.	No Image
<input type="checkbox"/> 10	146667	MCCRAY WELL DRILLING		6/1/1988	FRONTERY DAVID	WARREN	COLUMBUS TWP.	No Image
<input type="checkbox"/> 11	405216	JOHNSON DRILLING		4/25/1994	GADES	WARREN	COLUMBUS TWP.	View Image
<input type="checkbox"/> 12	405208	JOHNSON DRILLING		7/1/1997	HILL FARM	WARREN	COLUMBUS TWP.	View Image

<input type="checkbox"/>	13	405205	DANIEL P HORNBURG		9/1/1998	HORNBURG	WARREN	COLUMBUS TWP.	View Image
<input type="checkbox"/>	14	405202	JEFFREY COBB DRILLING		7/15/1999	JENSON	WARREN	COLUMBUS TWP.	View Image
<input type="checkbox"/>	15	405198	CLEARWATER DRILLING COMPANY		6/21/2000	JOGAITH	WARREN	COLUMBUS TWP.	View Image
<input type="checkbox"/>	16	405203	DANIEL P HORNBURG		8/3/1998	LAWSON	WARREN	COLUMBUS TWP.	View Image
<input type="checkbox"/>	17	405200	DANIEL P HORNBURG		6/18/1999	MCCLAIN	WARREN	COLUMBUS TWP.	View Image
<input type="checkbox"/>	18	405212	JENNINGS & SON DRILLING		5/1/1991	MCGURK	WARREN	COLUMBUS TWP.	View Image
<input type="checkbox"/>	19	405196	MCCRAY WELL DRILLING		10/1/2001	MICK	WARREN	COLUMBUS TWP.	View Image
<input type="checkbox"/>	20	405214	MCCRAY WELL DRILLING		9/1/1993	MIKE	WARREN	COLUMBUS TWP.	View Image

PA Topographic & Geologic Survey

PaGWIS

SELECTED WELLS

Menu

New Selection

Email comments to Topo Geo.

You have selected 35 Well(s). To create a comma separated list of all these wells, click **Create List**. If you want to limit the list, place check marks next to the wells you want to have included, and then click **Create List**.

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Record	PA Well ID	Driller	Driller Well ID	Date Drilled	Owner	County	Municipality	Image
<input type="checkbox"/> 21	146668	JOHNSON DRILLING		8/1/1988	MILLER LAWRENCE	WARREN	COLUMBUS TWP.	No Image
<input type="checkbox"/> 22	405197	CLEARWATER DRILLING COMPANY		9/21/2001	MOWAR	WARREN	COLUMBUS TWP.	View Image
<input type="checkbox"/> 23	405211	MCCRAY WELL DRILLING		7/1/1992	NAGEL	WARREN	COLUMBUS TWP.	View Image
<input type="checkbox"/> 24	146665	YORK WATER WELL DRILLING CO INC		5/1/1979	PEHY D	WARREN	COLUMBUS TWP.	No Image
<input type="checkbox"/> 25	405199	GILLIS BROTHERS INC		9/1/1986	RAYMOND	WARREN	COLUMBUS TWP.	View Image
<input type="checkbox"/> 26	405217	MCCANDLESS WELL DRILLING INC		7/30/1996	RAYMOND	WARREN	COLUMBUS TWP.	View Image
<input type="checkbox"/> 27	33599	YORK WATER WELL DRILLING CO INC		5/1/1985	REIFF, WILLIAM	WARREN	COLUMBUS TWP.	No Image
<input type="checkbox"/> 28	405206	JOHNSON DRILLING		4/1/1999	SCAMENS	WARREN	COLUMBUS TWP.	View Image
<input type="checkbox"/> 29	405207	JOHNSON DRILLING		8/1/1998	SEYMOUR	WARREN	COLUMBUS TWP.	View Image
<input type="checkbox"/> 30	405218	JOHNSON DRILLING		12/1/1993	SINGH	WARREN	COLUMBUS TWP.	View Image
<input type="checkbox"/> 31	405209	MCCRAY WELL DRILLING			SONDSTROM	WARREN	COLUMBUS TWP.	View Image
		MCCRAY			STOCTON,		COLUMBUS	No

<input type="checkbox"/>	32	33584	BROS		12/1/1979	CHARLES	WARREN	TWP.	Image
<input type="checkbox"/>	33	405204	DANIEL P HORNBURG		9/1/1998	TAYDUS	WARREN	COLUMBUS TWP.	View Image
<input type="checkbox"/>	34	405215	MCCRAY WELL DRILLING		6/1/1993	TRESSLEY	WARREN	COLUMBUS TWP.	View Image
<input type="checkbox"/>	35	146666	YORK WATER WELL DRILLING CO INC		5/1/1985	ZEIH C	WARREN	COLUMBUS TWP.	No Image

PA Topographic & Geologic Survey

PaGWIS

DETAILS FOR WELL 405210

[Email comments to Topo Geo.](#)

Record: 1 of 35

(There is a total of 35 Wells in the list.)

Well Driller: **ELIASON WATER WELL DRILLING**PA Well ID: **405210**License: **2094**

Driller Well ID:

Type of Activity:

Original Well By:

Date Drilled: **2/7/1994**

Drilling Method:

Owner:

Address of Well: **20 ACRE QUADRIN**

Zipcode:

County: **WARREN**Municipality: **COLUMBUS TWP.**

Quadrangle:

Latitude:

Longitude:

Well Depth (ft):

Well Finish:

Depth to Bedrock(ft):

Did Not Encounter Bedrock:

Well Yield (gpm):

Yield Measure Method:

Static Water Level:
(ft below land surface)Water level after yield test:
(ft below land surface)Length of Yield Test:
(minutes)

Saltwater Zone(ft):

Use of Well:

Use of Water:

Record: 1 of 35

(There is a total of 35 Wells in the list.)

PA Topographic & Geologic Survey

PaGWIS

DETAILS FOR WELL 33539

McCall

New Selection

[Email comments to Topo Geo.](#)

Record: 2 of 35

(There is a total of 35 Wells in the list.)

[New Well](#)[Previous](#)[Next Well](#)[Last Wells](#)[Return to Summary List](#)Well Driller: **ALFRED L BURCH**PA Well ID: **33539**License: **0975**

Driller Well ID:

Type of Activity:

Original Well By:

Date Drilled: **5/1/1966**Drilling Method: **CABLE TOOL**Owner: **ALLEN, BRUCE C**

Address of Well:

Zipcode:

County: **WARREN**Municipality: **COLUMBUS TWP.**Quadrangle: **COLUMBUS**Latitude: **41.90667** Longitude: **-79.55778**Well Depth (ft): **58**Well Finish: **UNKNOWN**

Depth to Bedrock(ft):

Did Not Encounter Bedrock:

Well Yield (gpm): **12**Yield Measure Method: **BAILER**Static Water Level: **12**
(ft below land surface)Water level after yield test: **18**
(ft below land surface)Length of Yield Test: **2**
(minutes)

Saltwater Zone(ft):

Use of Well: **WITHDRAWAL**Use of Water: **DOMESTIC**

Description of Well Location and Other Notes:

SAMPLE 9203230

BOREHOLE

Top Bottom Diameter

SECTION 1: 0 58 6

CASING

CASING 1: Top: 0 Bottom: 54 Diameter: 6 Material: UNKNOWN

SCREENS/SLOTS

SCREEN 1: Top: 54 Bottom: 54 Diameter:Type: **OTHER**Material: **UNKNOWN** Slot Size: **0**

Record: 2 of 35

(There is a total of 35 Wells in the list.)

[First Well](#)[Previous Well](#)[Next Well](#)[Last Well](#)[Detailed Summary](#)

PA Topographic & Geologic Survey

PaGWIS

DETAILS FOR WELL 405201

Menu

New Selection

[Email comments to Topo Geo.](#)

Record: 3 of 35

(There is a total of 35 Wells in the list.)

[First Well](#)[Prev Well](#)[Next Well](#)[Last Well](#)[Return to Summary List](#)Well Driller: **MCCRAY WELL DRILLING**PA Well ID: **405201**License: **1664**

Driller Well ID:

Type of Activity:

Original Well By:

Date Drilled: **10/1/1998**

Drilling Method:

Owner: **AYERS**Address of Well: **SC HILL RD, COLUMBUS**

Zipcode:

County: **WARREN**Municipality: **COLUMBUS TWP.**

Quadrangle:

Latitude:

Longitude:

Well Depth (ft):

Well Finish:

Depth to Bedrock(ft):

Did Not Encounter Bedrock:

Well Yield (gpm):

Yield Measure Method:

Static Water Level:
(ft below land surface)Water level after yield test:
(ft below land surface)Length of Yield Test:
(minutes)

Saltwater Zone(ft):

Use of Well:

Use of Water:

Record: 3 of 35

(There is a total of 35 Wells in the list.)

[First Well](#)[Prev Well](#)[Next Well](#)[Last Well](#)[Return to Summary List](#)

PA Topographic & Geologic Survey

PaGWIS

DETAILS FOR WELL 405194

[Email comments to Topo Geo.](#)

Record: 4 of 35

(There is a total of 35 Wells in the list.)

[First Well](#)[Previous Well](#)[Next Well](#)[Last Well](#)[Return to Summary List](#)Well Driller: **CLEARWATER DRILLING COMPANY**PA Well ID: **405194**License: **2073**

Driller Well ID:

Type of Activity:

Original Well By:

Date Drilled: **11/18/2002**

Drilling Method:

Owner: **BECKWITH**Address of Well: **BOX 22, BEAR LAKE**

Zipcode:

County: **WARREN**Municipality: **COLUMBUS TWP.**

Quadrangle:

Latitude:

Longitude:

Well Depth (ft):

Well Finish:

Depth to Bedrock(ft):

Did Not Encounter Bedrock:

Well Yield (gpm):

Yield Measure Method:

Static Water Level:
(ft below land surface)Water level after yield test:
(ft below land surface)Length of Yield Test:
(minutes)

Saltwater Zone(ft):

Use of Well:

Use of Water:

Record: 4 of 35

(There is a total of 35 Wells in the list.)

[First Well](#)[Previous Well](#)[Next Well](#)[Last Well](#)[Return to Summary List](#)

PA Topographic & Geologic Survey

PaGWIS

DETAILS FOR WELL 33614

Menu

New Record

Email comments to [Topo Geo](#).

Record: 5 of 35

(There is a total of 35 Wells in the list.)

[New Well](#) [Edit Well](#) [New Record](#) [Search](#)[Return to Summary List](#)Well Driller: **YORK WATER WELL DRILLING CO INC**PA Well ID: **33614**License: **1378**

Driller Well ID:

Type of Activity:

Original Well By:

Date Drilled: **6/1/1979**Drilling Method: **OTHER/UNKNOWN**Owner: **BEDJORSKI, C**

Address of Well:

Zipcode:

County: **WARREN**Municipality: **COLUMBUS TWP.**Quadrangle: **COLUMBUS**Latitude: **41.95139**Longitude: **-79.50417**Well Depth (ft): **130**Well Finish: **OPEN HOLE**

Depth to Bedrock(ft):

Did Not Encounter Bedrock:

**REPORTED,
METHOD NOT
KNOWN**Well Yield (gpm): **50**Yield Measure Method: **METHOD NOT
KNOWN**Static Water Level: **60**
(ft below land surface)Water level after yield test: **60**
(ft below land surface)Length of Yield Test: **0.3**
(minutes)

Saltwater Zone(ft):

Use of Well: **WITHDRAWAL**Use of Water: **DOMESTIC**

CASING

CASING 1: Top: **0** Bottom: **39** Diameter: **6** Material: **UNKNOWN**

Record: 5 of 35

(There is a total of 35 Wells in the list.)

[New Well](#) [Edit Well](#) [New Record](#) [Search](#)[Return to Summary List](#)

PA Topographic & Geologic Survey

PaGWIS

DETAILS FOR WELL 33629

Map

New Selection

[Email comments to Topo Geo.](#)

Record: 6 of 35

(There is a total of 35 Wells in the list.)

[First Well](#)[Prev Well](#)[Next Well](#)[Last Well](#)[Return to Summary List](#)Well Driller: **ACKERMAN DRILLING**PA Well ID: **33629**License: **1094**

Driller Well ID:

Type of Activity:

Original Well By:

Date Drilled: **10/1/1980**Drilling Method: **OTHER/UNKNOWN**Owner: **BULL, MICHEAL**

Address of Well:

Zipcode:

County: **WARREN**Municipality: **COLUMBUS TWP.**Quadrangle: **COLUMBUS**Latitude: **41.96222**Longitude: **-79.55083**Well Depth (ft): **65**Well Finish: **OPEN HOLE**

Depth to Bedrock(ft):

Did Not Encounter Bedrock:

Well Yield (gpm): **30**Yield Measure Method: **BAILER**Static Water Level: **13**
(ft below land surface)Water level after yield test: **45**
(ft below land surface)Length of Yield Test: **3**
(minutes)

Saltwater Zone(ft):

Use of Well: **WITHDRAWAL**Use of Water: **DOMESTIC**

BOREHOLE

Top Bottom Diameter

SECTION 1: **0 65 0**

CASING

CASING 1: Top: **0** Bottom: **12** Diameter: **6** Material: **UNKNOWN**

Record: 6 of 35

(There is a total of 35 Wells in the list.)

[First Well](#)[Prev Well](#)[Next Well](#)[Last Well](#)[Return to Summary List](#)

PA Topographic & Geologic Survey

PaGWIS

DETAILS FOR WELL 405195

Menu

New Selection

[Email comments to Topo Geo.](#)

Record: 7 of 35

(There is a total of 35 Wells in the list.)

[First Well](#)[Previous Well](#)[Next Well](#)[Last Well](#)[Return to Summary List](#)Well Driller: **SAXTON WELL SERVICE, INC.**PA Well ID: **405195**License: **2272**

Driller Well ID:

Type of Activity:

Original Well By:

Date Drilled: **1/1/2002**

Drilling Method:

Owner: **BYERS**Address of Well: **RD 1 BOX 34 I, SPRINGCREEK**

Zipcode:

County: **WARREN**Municipality: **COLUMBUS TWP.**

Quadrangle:

Latitude:

Longitude:

Well Depth (ft):

Well Finish:

Depth to Bedrock(ft):

Did Not Encounter Bedrock:

Well Yield (gpm):

Yield Measure Method:

Static Water Level:
(ft below land surface)Water level after yield test:
(ft below land surface)Length of Yield Test:
(minutes)

Saltwater Zone(ft):

Use of Well:

Use of Water:

Record: 7 of 35

(There is a total of 35 Wells in the list.)

[First Well](#)[Previous Well](#)[Next Well](#)[Last Well](#)[Return to Summary List](#)

PA Topographic & Geologic Survey

PaGWIS

DETAILS FOR WELL 405213

[Email comments to Topo Geo.](#)

Record: 8 of 35

(There is a total of 35 Wells in the list.)

[View Well](#) [New Well](#) [Search Well](#) [Edit Well](#)[Return to Summary List](#)Well Driller: **MCCRAY WELL DRILLING**PA Well ID: **405213**License: **1664**

Driller Well ID:

Type of Activity:

Original Well By:

Date Drilled: **7/1/1990**

Drilling Method:

Owner: **CORTER**Address of Well: **RD 1 BOX 31, COLUMBUS**

Zipcode:

County: **WARREN**Municipality: **COLUMBUS TWP.**

Quadrangle:

Latitude:

Longitude:

Well Depth (ft):

Well Finish:

Depth to Bedrock(ft):

Did Not Encounter Bedrock:

Well Yield (gpm):

Yield Measure Method:

Static Water Level:
(ft below land surface)Water level after yield test:
(ft below land surface)Length of Yield Test:
(minutes)

Saltwater Zone(ft):

Use of Well:

Use of Water:

Record: 8 of 35

(There is a total of 35 Wells in the list.)

[View Well](#) [New Well](#) [Search Well](#) [Edit Well](#)[Return to Summary List](#)

PA Topographic & Geologic Survey

PaGWIS

DETAILS FOR WELL 33531

Menu

New Selection

[Email comments to Topo Geo.](#)

Record: 9 of 35

(There is a total of 35 Wells in the list.)

[First Well](#) [Prev Well](#) [Next Well](#) [Last Well](#)[Return to Summary List](#)

Well Driller: JOHNSON'S DRILLING

PA Well ID: 33531

License: 1708

Driller Well ID:

Type of Activity:

Original Well By:

Date Drilled: 4/1/1986

Drilling Method: OTHER/UNKNOWN

Owner: EASTMAN , S

Address of Well:

Zipcode:

County: WARREN

Municipality: COLUMBUS TWP.

Quadrangle: COLUMBUS

Latitude: 41.90778

Longitude: -79.56583

Well Depth (ft): 70

Well Finish: OPEN HOLE

Depth to Bedrock(ft):

Did Not Encounter Bedrock:

Well Yield (gpm): 11.8

Yield Measure Method: BAILER

Static Water Level: 30
(ft below land surface)Water level after yield test: 70
(ft below land surface)Length of Yield Test: 0.3
(minutes)

Saltwater Zone(ft):

Use of Well: WITHDRAWAL

Use of Water: DOMESTIC

BOREHOLE

Top Bottom Diameter

SECTION 1: 0 70 6

CASING

CASING 1: Top: 0 Bottom: 60 Diameter: 6 Material: STEEL

WATER BEARING ZONE

WATER BEARING ZONE 1: Top: 62 Bottom: Yield:

WATER BEARING ZONE 2: Top: 68 Bottom: Yield:

Record: 9 of 35

(There is a total of 35 Wells in the list.)

[First Well](#) [Prev Well](#) [Next Well](#) [Last Well](#)[Return to Summary List](#)

PA Topographic & Geologic Survey

PaGWIS

DETAILS FOR WELL 146667

Menu

New Selection

[Email comments to Topo Geo.](#)

Record: 10 of 35

(There is a total of 35 Wells in the list.)

[First Well](#)[Prev Well](#)[Next Well](#)[Last Well](#)[Return to Summary List](#)Well Driller: **MCCRAY WELL DRILLING**PA Well ID: **146667**License: **1664**

Driller Well ID:

Type of Activity: **New Well**

Original Well By:

Date Drilled: **6/1/1988**

Drilling Method:

Owner: **FRONTERY DAVID**

Address of Well:

Zipcode:

County: **WARREN**Municipality: **COLUMBUS TWP.**Quadrangle: **COLUMBUS**Latitude: **41.89722**Longitude: **-79.56528**Well Depth (ft): **59**Well Finish: **OPEN HOLE**Depth to Bedrock(ft): **20**

Did Not Encounter Bedrock

Well Yield (gpm): **10**Yield Measure Method: **BAILER**Static Water Level: **20**
(ft below land surface)Water level after yield test: **35**
(ft below land surface)Length of Yield Test: **1**
(minutes)

Saltwater Zone(ft):

Use of Well: **WITHDRAWAL**Use of Water: **DOMESTIC**

CASING

CASING 1: Top: **0** Bottom: **21** Diameter: **6** Material:SEAL 1 Top: Bottom:Type: **NONE**

Record: 10 of 35

(There is a total of 35 Wells in the list.)

[First Well](#)[Prev Well](#)[Next Well](#)[Last Well](#)[Return to Summary List](#)

PA Topographic & Geologic Survey

PaGWIS

DETAILS FOR WELL 405216

[Email comments to Topo Geo.](#)

Record: 11 of 35

(There is a total of 35 Wells in the list.)

[First Well](#)[Previous Well](#)[Next Well](#)[Last Well](#)[Menu](#)[New Selection](#)[Return to Summary List](#)Well Driller: **JOHNSON DRILLING**PA Well ID: **405216**License: **0761**

Driller Well ID:

Type of Activity:

Original Well By:

Date Drilled: **4/25/1994**

Drilling Method:

Owner: **GADES**Address of Well: **SIMMONS RD, COLUMBUS**

Zipcode:

County: **WARREN**Municipality: **COLUMBUS TWP.**

Quadrangle:

Latitude:

Longitude:

Well Depth (ft):

Well Finish:

Depth to Bedrock(ft):

Did Not Encounter Bedrock:

Well Yield (gpm):

Yield Measure Method:

Static Water Level:
(ft below land surface)Water level after yield test:
(ft below land surface)Length of Yield Test:
(minutes)

Saltwater Zone(ft):

Use of Well:

Use of Water:

Record: 11 of 35

(There is a total of 35 Wells in the list.)

[First Well](#)[Previous Well](#)[Next Well](#)[Last Well](#)[Menu](#)[New Selection](#)[Return to Summary List](#)

PA Topographic & Geologic Survey

PaGWIS

DETAILS FOR WELL 405208

[Email comments to Topo Geo.](#)

Record: 12 of 35

(There is a total of 35 Wells in the list.)

[New Well](#) [Review](#) [New Well](#) [Edit Well](#)[Return to Summary List](#)Well Driller: **JOHNSON DRILLING**PA Well ID: **405208**License: **0761**

Driller Well ID:

Type of Activity:

Original Well By:

Date Drilled: **7/1/1997**

Drilling Method:

Owner: **HILL FARM**Address of Well: **RD 2 BOX 121, CORRY**

Zipcode:

County: **WARREN**Municipality: **COLUMBUS TWP.**

Quadrangle:

Latitude:

Longitude:

Well Depth (ft):

Well Finish:

Depth to Bedrock(ft):

Did Not Encounter Bedrock:

Well Yield (gpm):

Yield Measure Method:

Static Water Level:
(ft below land surface)Water level after yield test:
(ft below land surface)Length of Yield Test:
(minutes)

Saltwater Zone(ft):

Use of Well:

Use of Water:

Record: 12 of 35

(There is a total of 35 Wells in the list.)

[New Well](#) [Review](#) [New Well](#) [Edit Well](#)[Return to Summary List](#)

PA Topographic & Geologic Survey

PaGWIS

DETAILS FOR WELL 405205

[Email comments to Topo Geo.](#)

Record: 13 of 35

(There is a total of 35 Wells in the list.)

[First Well](#) [Previous](#) [Next Well](#) [Last Well](#)[Return to Summary List](#) [Print](#)

Well Driller: DANIEL P HORNBURG

PA Well ID: 405205

License: 2043

Driller Well ID:

Type of Activity:

Original Well By:

Date Drilled: 9/1/1998

Drilling Method:

Owner: HORNBURG

Address of Well: COLUMBUS

Zipcode:

County: WARREN

Municipality: COLUMBUS TWP.

Quadrangle:

Latitude:

Longitude:

Well Depth (ft):

Well Finish:

Depth to Bedrock (ft):

Did Not Encounter Bedrock:

Well Yield (gpm):

Yield Measure Method:

Static Water Level:
(ft below land surface)Water level after yield test:
(ft below land surface)Length of Yield Test:
(minutes)

Saltwater Zone (ft):

Use of Well:

Use of Water:

Record: 13 of 35

(There is a total of 35 Wells in the list.)

[First Well](#) [Previous](#) [Next Well](#) [Last Well](#)[Return to Summary List](#)

PA Topographic & Geologic Survey

PaGWIS

DETAILS FOR WELL 405202

[Email comments to Topo Geo.](#)

Record: 14 of 35

(There is a total of 35 Wells in the list.)

[First Well](#)[Previous Well](#)[Next Well](#)[Last Well](#)[View](#)[New Location](#)[Return to Summary List](#)Well Driller: **JEFFREY COBB DRILLING**PA Well ID: **405202**License: **2273**

Driller Well ID:

Type of Activity:

Original Well By:

Date Drilled: **7/15/1999**

Drilling Method:

Owner: **JENSON**Address of Well: **BOX 109**

Zipcode:

County: **WARREN**Municipality: **COLUMBUS TWP.**

Quadrangle:

Latitude:

Longitude:

Well Depth (ft):

Well Finish:

Depth to Bedrock(ft):

Did Not Encounter Bedrock:

Well Yield (gpm):

Yield Measure Method:

Static Water Level:
(ft below land surface)Water level after yield test:
(ft below land surface)Length of Yield Test:
(minutes)

Saltwater Zone(ft):

Use of Well:

Use of Water:

Record: 14 of 35

(There is a total of 35 Wells in the list.)

[First Well](#)[Previous Well](#)[Next Well](#)[Last Well](#)[Return to Summary List](#)

PA Topographic & Geologic Survey

PaGWIS

DETAILS FOR WELL 405198

[Email comments to Topo Geo.](#)

Record: 15 of 35

(There is a total of 35 Wells in the list.)

[New Wells](#)[New Wells](#)[New Wells](#)[New Wells](#)[New Selections](#)[Return to Summary List](#)Well Driller: **CLEARWATER DRILLING COMPANY**PA Well ID: **405198**License: **2073**

Driller Well ID:

Type of Activity:

Original Well By:

Date Drilled: **6/21/2000**

Drilling Method:

Owner: **JOGAITH**Address of Well: **RD 2 BOX 283**

Zipcode:

County: **WARREN**Municipality: **COLUMBUS TWP.**

Quadrangle:

Latitude:

Longitude:

Well Depth (ft):

Well Finish:

Depth to Bedrock(ft):

Did Not Encounter Bedrock:

Well Yield (gpm):

Yield Measure Method:

Static Water Level:
(ft below land surface)Water level after yield test:
(ft below land surface)Length of Yield Test:
(minutes)

Saltwater Zone(ft):

Use of Well:

Use of Water:

Record: 15 of 35

(There is a total of 35 Wells in the list.)

[New Wells](#)[New Wells](#)[New Wells](#)[New Wells](#)[New Selections](#)[Return to Summary List](#)

PA Topographic & Geologic Survey

PaGWIS

DETAILS FOR WELL 405203

[Email comments to Topo Geo.](#)

Record: 16 of 35

(There is a total of 35 Wells in the list.)

[First Well](#)[Prev Well](#)[Next Well](#)[Last Well](#)[Details](#)[New Selection](#)[Return to Summary List](#)

Well Driller: DANIEL P HORNBURG

PA Well ID: 405203

License: 2043

Driller Well ID:

Type of Activity:

Original Well By:

Date Drilled: 8/3/1998

Drilling Method:

Owner: LAWSON

Address of Well: RD 1, COLUMBUS

Zipcode:

County: WARREN

Municipality: COLUMBUS TWP.

Quadrangle:

Latitude:

Longitude:

Well Depth (ft):

Well Finish:

Depth to Bedrock(ft):

Did Not Encounter Bedrock:

Well Yield (gpm):

Yield Measure Method:

Static Water Level:
(ft below land surface)Water level after yield test:
(ft below land surface)Length of Yield Test:
(minutes)

Saltwater Zone(ft):

Use of Well:

Use of Water:

Record: 16 of 35

(There is a total of 35 Wells in the list.)

[First Well](#)[Prev Well](#)[Next Well](#)[Last Well](#)[Return to Summary List](#)

PA Topographic & Geologic Survey

PaGWIS

DETAILS FOR WELL 405200

Menu

New Selection

Email comments to [Topo Geo.](#)

Record: 17 of 35

(There is a total of 35 Wells in the list.)

[First Well](#)[Previous Well](#)[Next Well](#)[Last Well](#)[Return to Summary List](#)

Well Driller: DANIEL P HORNBURG

PA Well ID: 405200

License: 2043

Driller Well ID:

Type of Activity:

Original Well By:

Date Drilled: 6/18/1999

Drilling Method:

Owner: MCCLAIN

Address of Well: BOX 99M, COLUMBUS

Zipcode:

County: WARREN

Municipality: COLUMBUS TWP.

Quadrangle:

Latitude:

Longitude:

Well Depth (ft):

Well Finish:

Depth to Bedrock(ft):

Did Not Encounter Bedrock:

Well Yield (gpm):

Yield Measure Method:

Static Water Level:
(ft below land surface)Water level after yield test:
(ft below land surface)Length of Yield Test:
(minutes)

Saltwater Zone(ft):

Use of Well:

Use of Water:

Record: 17 of 35

(There is a total of 35 Wells in the list.)

[First Well](#)[Previous Well](#)[Next Well](#)[Last Well](#)[Return to Summary List](#)

PA Topographic & Geologic Survey

PaGWIS

DETAILS FOR WELL 405212

[Menu](#)[New Selection](#)[Email comments to Topo Geo.](#)

Record: 18 of 35

(There is a total of 35 Wells in the list.)

[First Well](#) [Previous Well](#) [Next Well](#) [Last Well](#)[Return to Summary List](#)

Well Driller: JENNINGS & SON DRILLING

PA Well ID: 405212

License: 0067

Driller Well ID:

Type of Activity:

Original Well By:

Date Drilled: 5/1/1991

Drilling Method:

Owner: MCGURK

Address of Well: RD 2 BOX 249, CORRY

Zipcode:

County: WARREN

Municipality: COLUMBUS TWP.

Quadrangle:

Latitude:

Longitude:

Well Depth (ft):

Well Finish:

Depth to Bedrock(ft):

Did Not Encounter Bedrock:

Well Yield (gpm):

Yield Measure Method:

Static Water Level:
(ft below land surface)Water level after yield test:
(ft below land surface)Length of Yield Test:
(minutes)

Saltwater Zone(ft):

Use of Well:

Use of Water:

Record: 18 of 35

(There is a total of 35 Wells in the list.)

[First Well](#) [Previous Well](#) [Next Well](#) [Last Well](#)[Return to Summary List](#)

PA Topographic & Geologic Survey

PaGWIS

DETAILS FOR WELL 405196

[Logout](#)[New Selection](#)[Email comments to Topo Geo.](#)

Record: 19 of 35

(There is a total of 35 Wells in the list.)

[First Well](#)[Previous Well](#)[Next Well](#)[Last Well](#)[Return to Summary List](#)Well Driller: **MCCRAY WELL DRILLING**PA Well ID: **405196**License: **1664**

Driller Well ID:

Type of Activity:

Original Well By:

Date Drilled: **10/1/2001**

Drilling Method:

Owner: **MICK**Address of Well: **HERDFORD RD**

Zipcode:

County: **WARREN**Municipality: **COLUMBUS TWP.**

Quadrangle:

Latitude:

Longitude:

Well Depth (ft):

Well Finish:

Depth to Bedrock(ft):

Did Not Encounter Bedrock:

Well Yield (gpm):

Yield Measure Method:

Static Water Level:
(ft below land surface)Water level after yield test:
(ft below land surface)Length of Yield Test:
(minutes)

Saltwater Zone(ft):

Use of Well:

Use of Water:

Record: 19 of 35

(There is a total of 35 Wells in the list.)

[First Well](#)[Previous Well](#)[Next Well](#)[Last Well](#)[Return to Summary List](#)

PA Topographic & Geologic Survey

PaGWIS

DETAILS FOR WELL 405214

Menu

New Selection

[Email comments to Topo Geo.](#)

Record: 20 of 35

(There is a total of 35 Wells in the list.)

[First Well](#)[Next Well](#)[Previous Well](#)[Last Well](#)[Return to Summary List](#)Well Driller: **MCCRAY WELL DRILLING**PA Well ID: **405214**License: **1664**

Driller Well ID:

Type of Activity:

Original Well By:

Date Drilled: **9/1/1993**

Drilling Method:

Owner: **MIKE**Address of Well: **9696 BAKER HILL RD**

Zipcode:

County: **WARREN**Municipality: **COLUMBUS TWP.**

Quadrangle:

Latitude:

Longitude:

Well Depth (ft):

Well Finish:

Depth to Bedrock(ft):

Did Not Encounter Bedrock:

Well Yield (gpm):

Yield Measure Method:

Static Water Level:
(ft below land surface)Water level after yield test:
(ft below land surface)Length of Yield Test:
(minutes)

Saltwater Zone(ft):

Use of Well:

Use of Water:

Record: 20 of 35

(There is a total of 35 Wells in the list.)

[First Well](#)[Next Well](#)[Previous Well](#)[Last Well](#)[Return to Summary List](#)

PA Topographic & Geologic Survey

PaGWIS

DETAILS FOR WELL 146668

Email comments to [Topo Geo.](#)

Record: 21 of 35

(There is a total of 35 Wells in the list.)

[First Well](#)[Prev. Well](#)[Next Well](#)[Last Well](#)[Return to Summary List](#)Well Driller: **JOHNSON DRILLING**PA Well ID: **146668**License: **0761**

Driller Well ID:

Type of Activity: **New Well**

Original Well By:

Date Drilled: **8/1/1988**

Drilling Method:

Owner: **MILLER LAWRENCE**

Address of Well:

Zipcode:

County: **WARREN**Municipality: **COLUMBUS TWP.**Quadrangle: **COLUMBUS**Latitude: **41.9725**Longitude: **-79.60667**Well Depth (ft): **62**Well Finish: **OPEN HOLE**Depth to Bedrock(ft): **6**

Did Not Encounter Bedrock:

Well Yield (gpm): **20**Yield Measure Method: **BAILER**Static Water Level: **12**
(ft below land surface)Water level after yield test: **40**
(ft below land surface)Length of Yield Test: **1.42**
(minutes)

Saltwater Zone(ft):

Use of Well: **WITHDRAWAL**Use of Water: **STOCK**

CASING

CASING 1: Top: **0** Bottom: **23** Diameter: **8** Material:SEAL 1 Top: Bottom: Type: **UNKNOWN**

WATER BEARING ZONE

WATER BEARING ZONE 1: Top: **32** Bottom: Yield:WATER BEARING ZONE 2: Top: **46** Bottom: Yield:

Record: 21 of 35

(There is a total of 35 Wells in the list.)

[First Well](#)[Prev. Well](#)[Next Well](#)[Last Well](#)[Return to Summary List](#)

PA Topographic & Geologic Survey

PaGWIS

DETAILS FOR WELL 405197

[Menu](#)[New Selection](#)[Email comments to Topo Geo.](#)

Record: 22 of 35

(There is a total of 35 Wells in the list.)

[SEARCH](#) [SEARCH](#) [SEARCH](#) [SEARCH](#)[Return to Summary List](#)Well Driller: **CLEARWATER DRILLING COMPANY**PA Well ID: **405197**License: **2073**

Driller Well ID:

Type of Activity:

Original Well By:

Date Drilled: **9/21/2001**

Drilling Method:

Owner: **MOWAR**Address of Well: **RT 417 W PO BOX 189**

Zipcode:

County: **WARREN**Municipality: **COLUMBUS TWP.**

Quadrangle:

Latitude:

Longitude:

Well Depth (ft):

Well Finish:

Depth to Bedrock(ft):

Did Not Encounter Bedrock:

Well Yield (gpm):

Yield Measure Method:

Static Water Level:
(ft below land surface)Water level after yield test:
(ft below land surface)Length of Yield Test:
(minutes)

Saltwater Zone(ft):

Use of Well:

Use of Water:

Record: 22 of 35

(There is a total of 35 Wells in the list.)

[SEARCH](#) [SEARCH](#) [SEARCH](#) [SEARCH](#)[Return to Summary List](#)

PA Topographic & Geologic Survey

PaGWIS

DETAILS FOR WELL 405211

[Email comments to Topo Geo.](#)

Record: 23 of 35

(There is a total of 35 Wells in the list.)

[First Well](#) [Previous Well](#) [Next Well](#) [Last Well](#)[Return to Summary List](#)

Well Driller: MCCRAY WELL DRILLING

PA Well ID: 405211

License: 1664

Driller Well ID:

Type of Activity:

Original Well By:

Date Drilled: 7/1/1992

Drilling Method:

Owner: NAGEL

Address of Well: COTTAGE PARK, COLUMBUS

Zipcode:

County: WARREN

Municipality: COLUMBUS TWP.

Quadrangle:

Latitude:

Longitude:

Well Depth (ft):

Well Finish:

Depth to Bedrock(ft):

Did Not Encounter Bedrock:

Well Yield (gpm):

Yield Measure Method:

Static Water Level:
(ft below land surface)Water level after yield test:
(ft below land surface)Length of Yield Test:
(minutes)

Saltwater Zone(ft):

Use of Well:

Use of Water:

Record: 23 of 35

(There is a total of 35 Wells in the list.)

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PA Topographic & Geologic Survey

PaGWIS

DETAILS FOR WELL 146665

Menu

New Selection

Email comments to [Topo Geo](#).

Record: 24 of 35

(There is a total of 35 Wells in the list.)

[View Well](#) [View Well](#) [View Well](#) [View Well](#)[Return to Summary List](#)Well Driller: **YORK WATER WELL DRILLING CO INC**PA Well ID: **146665**License: **1378**

Driller Well ID:

Type of Activity: **New Well**

Original Well By:

Date Drilled: **5/1/1979**

Drilling Method:

Owner: **PEHY D**

Address of Well:

Zipcode:

County: **WARREN**Municipality: **COLUMBUS TWP.**Quadrangle: **COLUMBUS**Latitude: **41.91778**Longitude: **-79.50445**Well Depth (ft): **100**Well Finish: **OPEN HOLE**Depth to Bedrock(ft): **77**

Did Not Encounter Bedrock:

Well Yield (gpm): **7**Yield Measure Method: **VOLUMETRIC,
WATCH &
BUCKET**Static Water Level: **60**
(ft below land surface)Water level after yield test: **60**
(ft below land surface)Length of Yield Test: **0.25**
(minutes)

Saltwater Zone(ft):

Use of Well: **WITHDRAWAL**Use of Water: **DOMESTIC**

Description of Well Location and Other Notes:

3/4 WAY UP HILL SIDE LOT 3322**CASING****CASING 1:** Top: **0** Bottom: **78.7** Diameter: **6** Material:**WATER BEARING ZONE****WATER BEARING ZONE 1:** Top: **77** Bottom: **Yield:****WATER BEARING ZONE 2:** Top: **90** Bottom: **Yield:**

Record: 24 of 35

(There is a total of 35 Wells in the list.)



PA Topographic & Geologic Survey

PaGWIS

DETAILS FOR WELL 405199

[Menu](#)[New Selection](#)[Email comments to Topo Geo.](#)

Record: 25 of 35

(There is a total of 35 Wells in the list.)

[First Well](#)[Previous Well](#)[Next Well](#)[Last Well](#)[Return to Summary List](#)Well Driller: **GILLIS BROTHERS INC**PA Well ID: **405199**License: **0649**

Driller Well ID:

Type of Activity:

Original Well By:

Date Drilled: **9/1/1986**

Drilling Method:

Owner: **RAYMOND**Address of Well: **COLUMBUS RD, COLUMBUS**

Zipcode:

County: **WARREN**Municipality: **COLUMBUS TWP.**

Quadrangle:

Latitude:

Longitude:

Well Depth (ft):

Well Finish:

Depth to Bedrock(ft):

Did Not Encounter Bedrock:

Well Yield (gpm):

Yield Measure Method:

Static Water Level:
(ft below land surface)Water level after yield test:
(ft below land surface)Length of Yield Test:
(minutes)

Saltwater Zone(ft):

Use of Well:

Use of Water:

Record: 25 of 35

(There is a total of 35 Wells in the list.)

[First Well](#)[Previous Well](#)[Next Well](#)[Last Well](#)[Return to Summary List](#)

PA Topographic & Geologic Survey

PaGWIS

DETAILS FOR WELL 405217

[Email comments to Topo Geo.](#)

Record: 26 of 35

(There is a total of 35 Wells in the list.)

[Find Well](#)[Edit Well](#)[View Well](#)[Delete Well](#)[Return to Summary List](#)Well Driller: **MCCANDLESS WELL DRILLING INC**PA Well ID: **405217**License: **1393**

Driller Well ID:

Type of Activity:

Original Well By:

Date Drilled: **7/30/1996**

Drilling Method:

Owner: **RAYMOND**Address of Well: **COLUMBUS**

Zipcode:

County: **WARREN**Municipality: **COLUMBUS TWP.**

Quadrangle:

Latitude:

Longitude:

Well Depth (ft):

Well Finish:

Depth to Bedrock(ft):

Did Not Encounter Bedrock:

Well Yield (gpm):

Yield Measure Method:

Static Water Level:
(ft below land surface)Water level after yield test:
(ft below land surface)Length of Yield Test:
(minutes)

Saltwater Zone(ft):

Use of Well:

Use of Water:

Record: 26 of 35

(There is a total of 35 Wells in the list.)

[Find Well](#)[Edit Well](#)[View Well](#)[Delete Well](#)[Return to Summary List](#)

PA Topographic & Geologic Survey

PaGWIS

DETAILS FOR WELL 33599

[Menu](#)[New Selection](#)[Email comments to Topo Geo.](#)

Record: 27 of 35

(There is a total of 35 Wells in the list.)

[First Well](#)[Last Well](#)[Next Well](#)[Previous Well](#)[Return to Summary List](#)Well Driller: **YORK WATER WELL DRILLING CO INC**PA Well ID: **33599**License: **1378**

Driller Well ID:

Type of Activity:

Original Well By:

Date Drilled: **5/1/1985**Drilling Method: **OTHER/UNKNOWN**Owner: **REIFF, WILLIAM**

Address of Well:

Zipcode:

County: **WARREN**Municipality: **COLUMBUS TWP.**Quadrangle: **COLUMBUS**Latitude: **41.94361**Longitude: **-79.56973**Well Depth (ft): **60**Well Finish: **OPEN HOLE**

Depth to Bedrock(ft):

Did Not Encounter Bedrock:

Well Yield (gpm):

Yield Measure Method:

Static Water Level: **9.7**
(ft below land surface)Water level after yield test:
(ft below land surface)Length of Yield Test:
(minutes)

Saltwater Zone(ft):

Use of Well: **WITHDRAWAL**Use of Water: **DOMESTIC**

BOREHOLE

Top Bottom Diameter

SECTION 1: **0 60 0**

CASING

CASING 1: Top: **0** Bottom: **37** Diameter: **6** Material: **STEEL**

Record: 27 of 35

(There is a total of 35 Wells in the list.)

[First Well](#)[Last Well](#)[Next Well](#)[Previous Well](#)[Return to Summary List](#)

PA Topographic & Geologic Survey

PaGWIS

DETAILS FOR WELL 405206

[Email comments to Topo Geo.](#)

Record: 28 of 35

(There is a total of 35 Wells in the list.)

[View Well](#)[View Map](#)[View Well](#)[View Well](#)[Home](#)[View All Wells](#)[Return to Summary List](#)Well Driller: **JOHNSON DRILLING**PA Well ID: **405206**License: **0761**

Driller Well ID:

Type of Activity:

Original Well By:

Date Drilled: **4/1/1999**

Drilling Method:

Owner: **SCAMENS**Address of Well: **RD 1 BLUE EYE RD, COLUMBUS**

Zipcode:

County: **WARREN**Municipality: **COLUMBUS TWP.**

Quadrangle:

Latitude:

Longitude:

Well Depth (ft):

Well Finish:

Depth to Bedrock(ft):

Did Not Encounter Bedrock:

Well Yield (gpm):

Yield Measure Method:

Static Water Level:
(ft below land surface)Water level after yield test:
(ft below land surface)Length of Yield Test:
(minutes)

Saltwater Zone(ft):

Use of Well:

Use of Water:

Record: 28 of 35

(There is a total of 35 Wells in the list.)

[View Well](#)[View Map](#)[View Well](#)[View Well](#)[Return to Summary List](#)

PA Topographic & Geologic Survey

PaGWIS

DETAILS FOR WELL 405207

[Mem.](#)[New Selection](#)[Email comments to Topo Geo.](#)

Record: 29 of 35

(There is a total of 35 Wells in the list.)

[First Well](#)[Prev Well](#)[Next Well](#)[Last Well](#)[Return to Summary List](#)Well Driller: **JOHNSON DRILLING**PA Well ID: **405207**License: **0761**

Driller Well ID:

Type of Activity:

Original Well By:

Date Drilled: **8/1/1998**

Drilling Method:

Owner: **SEYMOUR**Address of Well: **RR 1 BOX 30A PINE VALLEY RD,
COLUMBUS**

Zipcode:

County: **WARREN**Municipality: **COLUMBUS TWP.**

Quadrangle:

Latitude:

Longitude:

Well Depth (ft):

Well Finish:

Depth to Bedrock(ft):

Did Not Encounter Bedrock:

Well Yield (gpm):

Yield Measure Method:

Static Water Level:
(ft below land surface)Water level after yield test:
(ft below land surface)Length of Yield Test:
(minutes)

Saltwater Zone(ft):

Use of Well:

Use of Water:

Record: 29 of 35

(There is a total of 35 Wells in the list.)

[First Well](#)[Prev Well](#)[Next Well](#)[Last Well](#)[Return to Summary List](#)

PA Topographic & Geologic Survey

PaGWIS

DETAILS FOR WELL 405218

[Email comments to Topo Geo.](#)

Record: 30 of 35

(There is a total of 35 Wells in the list.)

[Return to Summary List](#)Well Driller: **JOHNSON DRILLING**PA Well ID: **405218**License: **0761**

Driller Well ID:

Type of Activity:

Original Well By:

Date Drilled: **12/1/1993**

Drilling Method:

Owner: **SINGH**Address of Well: **BESE LAKE**

Zipcode:

County: **WARREN**Municipality: **COLUMBUS TWP.**

Quadrangle:

Latitude:

Longitude:

Well Depth (ft):

Well Finish:

Depth to Bedrock(ft):

Did Not Encounter Bedrock:

Well Yield (gpm):

Yield Measure Method:

Static Water Level:
(ft below land surface)Water level after yield test:
(ft below land surface)Length of Yield Test:
(minutes)

Saltwater Zone(ft):

Use of Well:

Use of Water:

Record: 30 of 35

(There is a total of 35 Wells in the list.)

[Return to Summary List](#)

PA Topographic & Geologic Survey

PaGWIS

DETAILS FOR WELL 405209

Menu

New Selection

Email comments to [Topo Geo.](#)

Record: 31 of 35

(There is a total of 35 Wells in the list.)

[Edit Well](#)[Delete Well](#)[New Well](#)[List Well](#)[Return to Summary List](#)Well Driller: **MCCRAY WELL DRILLING**PA Well ID: **405209**License: **1664**

Driller Well ID:

Type of Activity:

Original Well By:

Date Drilled:

Drilling Method:

Owner: **SONDSTROM**Address of Well: **SPENCER RD**

Zipcode:

County: **WARREN**Municipality: **COLUMBUS TWP.**

Quadrangle:

Latitude:

Longitude:

Well Depth (ft):

Well Finish:

Depth to Bedrock(ft):

Did Not Encounter Bedrock:

Well Yield (gpm):

Yield Measure Method:

Static Water Level:
(ft below land surface)Water level after yield test:
(ft below land surface)Length of Yield Test:
(minutes)

Saltwater Zone(ft):

Use of Well:

Use of Water:

Record: 31 of 35

(There is a total of 35 Wells in the list.)

[Edit Well](#)[Delete Well](#)[New Well](#)[List Well](#)[Return to Summary List](#)

PA Topographic & Geologic Survey

PaGWIS

DETAILS FOR WELL 33584

Email comments to [Topo Geo](#).

Record: 32 of 35

(There is a total of 35 Wells in the list.)

Well Driller: **MCCRAY BROS**PA Well ID: **33584**License: **0224**

Driller Well ID:

Type of Activity:

Original Well By:

Date Drilled: **12/1/1979**Drilling Method: **CABLE TOOL**Owner: **STOCTON, CHARLES**

Address of Well:

Zipcode:

County: **WARREN**Municipality: **COLUMBUS TWP.**Quadrangle: **COLUMBUS**Latitude: **41.93444**Longitude: **-79.58167**Well Depth (ft): **42**Well Finish: **UNKNOWN**

Depth to Bedrock(ft):

Did Not Encounter Bedrock:

**VOLUMETRIC,
WATCH &
BUCKET**
Well Yield (gpm): **2**

Yield Measure Method:

Static Water Level: **20**
(ft below land surface)Water level after yield test: **40**
(ft below land surface)Length of Yield Test:
(minutes)

Saltwater Zone(ft):

Use of Well: **WITHDRAWAL**Use of Water: **DOMESTIC****BOREHOLE**

Top Bottom Diameter

SECTION 1: **0 42 0****CASING**CASING 1: Top: **0** Bottom: **42** Diameter: **8** Material: **UNKNOWN**

Record: 32 of 35

(There is a total of 35 Wells in the list.)



PA Topographic & Geologic Survey

PaGWIS

DETAILS FOR WELL 405204

[Menu]

[New Search]

Email comments to [Topo Geo](#).

Record: 33 of 35

(There is a total of 35 Wells in the list.)

[View Well]

[Print Well]

[View Map]

[Print Map]

[Return to Summary List]

Well Driller: **DANIEL P HORNBURG**PA Well ID: **405204**License: **2043**

Driller Well ID:

Type of Activity:

Original Well By:

Date Drilled: **9/1/1998**

Drilling Method:

Owner: **TAYDUS**Address of Well: **RD 1, COLUMBUS**

Zipcode:

County: **WARREN**Municipality: **COLUMBUS TWP.**

Quadrangle:

Latitude:

Longitude:

Well Depth (ft):

Well Finish:

Depth to Bedrock(ft):

Did Not Encounter Bedrock:

Well Yield (gpm):

Yield Measure Method:

Static Water Level:
(ft below land surface)Water level after yield test:
(ft below land surface)Length of Yield Test:
(minutes)

Saltwater Zone(ft):

Use of Well:

Use of Water:

Record: 33 of 35

(There is a total of 35 Wells in the list.)

[View Well]

[Print Well]

[View Map]

[Print Map]

[Return to Summary List]

PA Topographic & Geologic Survey

PaGWIS

DETAILS FOR WELL 405215

MGT

New Selection

[Email comments to Topo Geo.](#)

Record: 34 of 35

(There is a total of 35 Wells in the list.)

[General](#) [New Selection](#) [Search](#) [List View](#)[Return to Summary List](#)

Well Driller: MCCRAY WELL DRILLING

PA Well ID: 405215

License: 1664

Driller Well ID:

Type of Activity:

Original Well By:

Date Drilled: 6/1/1993

Drilling Method:

Owner: TRESSLEY

Address of Well: RD 1, COLUMBUS

Zipcode:

County: WARREN

Municipality: COLUMBUS TWP.

Quadrangle:

Latitude:

Longitude:

Well Depth (ft):

Well Finish:

Depth to Bedrock(ft):

Did Not Encounter Bedrock:

Well Yield (gpm):

Yield Measure Method:

Static Water Level:
(ft below land surface)Water level after yield test:
(ft below land surface)Length of Yield Test:
(minutes)

Saltwater Zone(ft):

Use of Well:

Use of Water:

Record: 34 of 35

(There is a total of 35 Wells in the list.)

[General](#) [New Selection](#) [Search](#) [List View](#)[Return to Summary List](#)

PA Topographic & Geologic Survey

PaGWIS

DETAILS FOR WELL 146666

Menu

New Selection

[Email comments to Topo Geo.](#)

Record: 35 of 35

(There is a total of 35 Wells in the list.)

[First Well](#)[Previous](#)[Return to Summary List](#)Well Driller: **YORK WATER WELL DRILLING CO INC**PA Well ID: **146666**License: **1378**

Driller Well ID:

Type of Activity: **New Well**

Original Well By:

Date Drilled: **5/1/1985**

Drilling Method:

Owner: **ZEIH C**

Address of Well:

Zipcode:

County: **WARREN**Municipality: **COLUMBUS TWP.**Quadrangle: **COLUMBUS**Latitude: **41.94361**Longitude: **-79.57**Well Depth (ft): **60**Well Finish: **OPEN HOLE**Depth to Bedrock(ft): **35**

Did Not Encounter Bedrock:

Well Yield (gpm): **9**

Yield Measure Method:

**VOLUMETRIC,
WATCH &
BUCKET**Static Water Level: **48**
(ft below land surface)Water level after yield test: **48**
(ft below land surface)Length of Yield Test: **0.33**
(minutes)

Saltwater Zone(ft):

Use of Well: **WITHDRAWAL**Use of Water: **DOMESTIC****CASING****CASING 1:** Top: **0** Bottom: **37** Diameter: **6** Material:**WATER BEARING ZONE****WATER BEARING ZONE 1:** Top: **45** Bottom: **Yield:****WATER BEARING ZONE 2:** Top: **51** Bottom: **Yield:**

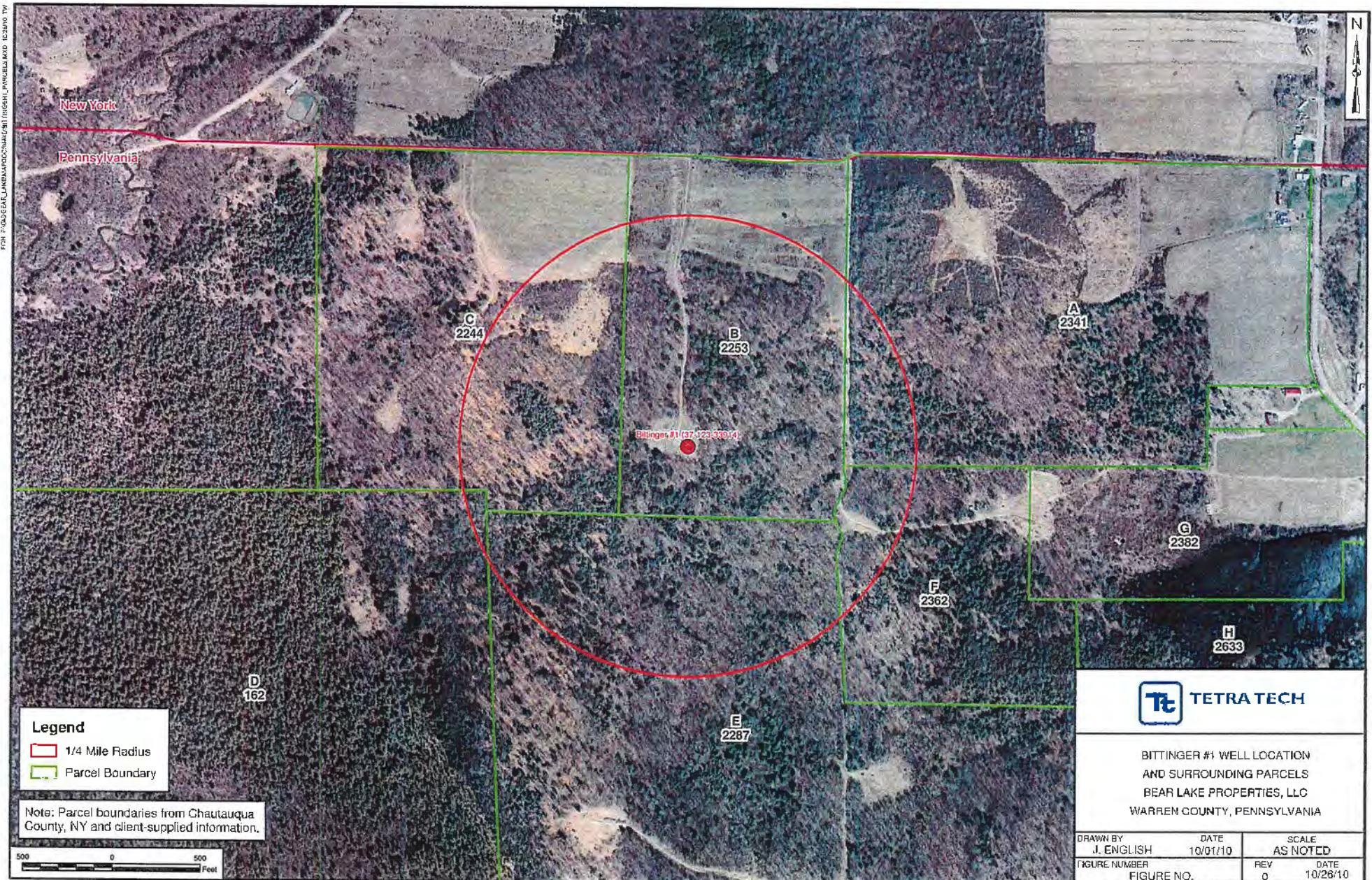
Record: 35 of 35

(There is a total of 35 Wells in the list.)

[First Well](#)[Previous](#)[Return to Summary List](#)

Appendix B

Appendix B contains the names and address of residents located within ¼ mile of the proposed injection well.



PARCEL #	OWNER	ADDRESS
A 2341	Bear Lake Properties, LLC	3010 Village Run, Suite 103, Wexford, PA 15090
B 2253	Miles and Joyce Sampsel	8353 Pagan Road, Erie, PA 16509
C 2244	John R. and Kathryn Triskett	P.O. Box 88, Ashville, NY 14710
D 162	Commonwealth of Pennsylvania	2001 Elmerton Ave., Harrisburg, PA 17110
E 2287	Cornish Lumber Company, Inc.	P.O. Box 140, Bear Lake, PA 16402
F 2362	Jack and Marilyn McCoy	P.O. Box 112, Columbus, PA 16405