

## **Section 6 – Operating Data**

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The proposed commercial brine disposal well will primarily be utilized to inject produced and flowback water from wells completed in the Marcellus Shale, the Medina Group and other natural gas and oil producing formations. Other oil and gas related wastewaters associated with the production of oil and natural gas or natural gas storage operations, which are approved by EPA for injection under a UIC Class II D injection well, may also be injected. According to Title 40 Chapter I Sec. 144.6 (b)(1), such fluids include those "Which are brought to the surface in connection with natural gas storage operations, or conventional oil or natural gas production and may be commingled with waste waters from gas plants which are an integral part of production operations, unless those waters are classified as a hazardous waste at the time of injection."

### **Injection Rate**

Injection rate and pressure data collected to date for the nearby Bittering #4 permitted brine disposal well indicate the well is capable of a sustainable injection rate of approximately 1,000 bbls/day while operating within the maximum injection pressure permit limit. This is consistent with the permitted injection volume of 30,000 bbls/month for this well. (The 2014 Annual Disposal/Injection Well Monitoring Report for Bittering #4 is attached.) Considering the proximity of the Bittering #3 well to the Bittering #4 well (which is located approximately 0.5 mile to the west) and the similarity in the injection interval based on log analysis, it is anticipated that the Bittering #3 well can also be operated at this injection rate while staying below the proposed MIP. (Please see the attached Billman Geologic Consultants report and included geologic cross-sections.) An injection rate of 30,000 bbls/month is therefore also proposed for the Bittering #3 well.

### **Maximum Allowable Surface Injection Pressure (MASIP) and Average Surface Injection Pressure**

MASIP calculations based on EPA approved equations are included in the "Geologic Data" section of this application. Based on these calculations, the proposed MASIP is 1732 psi. It is estimated that the average surface injection pressure will be approximately 1000 psi.

### **Laboratory Analysis of Injection Fluid Samples**

Laboratory analytical results for samples representative of the types of brine which will be injected into the proposed injection well are attached. Samples were collected from produced water generated from gas wells in the vicinity of the injection well as well as Marcellus brine from a brine processing facility.

### **Monitoring of Injection Fluid Samples and Well**

The following identifies the UIC Class II underground injection well regulatory requirements and operational procedures which will be conducted to meet the subject requirements:

1. **Monitoring of the nature of injected fluids at time intervals sufficiently frequent to yield data representative of their characteristics.** An initial sample of fluid will be collected and analyzed from initial loads proposed for disposal from new disposal customers. In addition, samples will be collected for analysis from new types of sources (e.g., from different geologic formations, geographic regions, etc.) which would be expected to differ significantly from brine previously characterized for disposal at the facility. Samples will be analyzed for the following parameters at a minimum: specific gravity, total dissolved solids and pH.
2. **Observation of injection pressure, flow rate, and cumulative volume at least weekly based on the regulatory requirements for produced fluid disposal operations.** Injection pressures,

annular pressure, injection rate, and cumulative volume will be continuously monitored and recorded electronically.

3. **A demonstration of mechanical integrity pursuant to 40 CFR Sec. 146.8 at least once every two years during the life of the injection well.** A mechanical integrity test will be performed prior to initiating injection and at least once every two years.
4. **Maintenance of the results of all monitoring until the next permit review.** All monitoring records will be maintained throughout the life of the well.

Reporting requirements consist of the following:

An annual report will be submitted to EPA summarizing the results of the required monitoring, including monthly records of injected fluids, and any major changes in characteristics or sources of injected fluid.

### **Proposed Annulus Fluid**

The proposed annulus fluid for the proposed injection well will consist of fresh water and a water soluble corrosion inhibitor. The corrosion inhibitor will be mixed in accordance with the manufacturer's recommendations then loaded into the well annulus prior to conducting injection operations. Product information for the type of corrosion inhibitor which will be utilized is attached. A similar type product may be used instead of the example product referenced.

### **Facility Layout and Operation**

The attached drawing shows the following elements of the existing Bear Lake Properties brine disposal well facility including the recently permitted and constructed brine storage area. The brine storage facility was permitted as a residual waste transfer facility under PADEP residual waste regulations. The following key elements of the brine disposal facility are shown on the attached drawing:

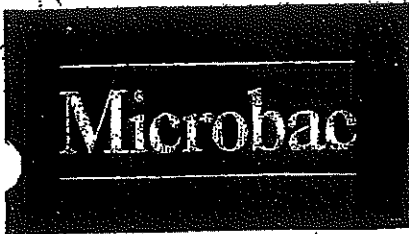
- Existing permitted brine offloading facility located at the corner of State Route 4004 and State Line Road;
- The brine storage facility (located near the Bittinger #2 well) which is connected to the unloading area by underground double-walled piping; and,
- The three existing permitted UIC Class IID wells (Bittinger #1, #2 and #4) plus proposed UIC Class IID wells (Bittinger #3 and Smith-Ras Unit #1).

The brine storage facility has a capacity of 3,000 barrels and is anticipated to be operational during the First Quarter of 2015. A drawing showing details of the brine storage facility is attached.

Once the brine storage facility is operational, brine will be pumped from the offload station via the dual (secondary containment) pipeline to the storage tanks at the brine storage facility. The brine will then be pumped from the brine storage facility via high pressure dual (secondary containment) pipelines to the permitted brine disposal wells for injection.

The storage tanks in the brine storage area are located within a diked containment area with the containment area sized to account for the entire volume of the largest container, plus 10%. Automatic shut-off valves are incorporated into the tank design to prevent overflow during filling operations. The facility is surrounded by a fence having locking entrance and exit gates. A security camera is also strategically situated on the site.

**OPERATING DATA**  
**TYPICAL BRINE LABORATORY ANALYSIS**



® Microbac Laboratories, Inc.

BRADFORD DIVISION  
P.O. BOX 489  
BRADFORD PA 16701  
(814)368-6087

88353

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CERTIFICATE OF ANALYSIS

KCS LENAPE RESOURCES CORP.

9489 ALEXANDER ROAD

ALEXANDER NY 14005

LAUBER-TOPLONKA

Permit No  
Cust P.O.

Date Reported 8/10/01  
Date Received 7/13/01  
Order No 9931-00207  
Invoice No 008010  
Cust # K011  
Sampled Date 7/09/01  
Sampled Time 00:00  
Sample Id

Subject: LION ENERGY - BRINE SAMPLE SUBMITTED 7/13/01

IMP	TEST	METHOD	RESULT	UNITS	DATE	TECH
	LION ENERGY - BRINE SAMPLE					
	BY WGT SALTS IN BRINE				7/23/01	ERI
	CHLORIDE		33,600	MG/L	7/23/01	ERI
	POTASSIUM		195,000	MG/L	7/23/01	ERI
	MAGNESIUM		1910	MG/L	7/23/01	ERI
	SODIUM		3330	MG/L	7/23/01	ERI
	SODIUM		80,700	MG/L	7/23/01	ERI
	SPECIFIC GRAVITY		1.216		7/23/01	ERI
	CALCIUM CHLORIDE		7.65	% BY WGT.	7/23/01	ERI
	SODIUM CHLORIDE		16.92	% BY WGT.	7/23/01	ERI
	POTASSIUM CHLORIDE		0.30	% BY WGT.	7/23/01	ERI
	MAGNESIUM CHLORIDE		1.07	% BY WGT.	7/23/01	ERI
	TOTAL CHLORIDES		25.84	% BY WGT.	7/23/01	ERI
	CALCIUM CHLORIDE		0.776	LBS/GAL.	7/23/01	ERI
	SODIUM CHLORIDE		1.707	LBS/GAL.	7/23/01	ERI
	POTASSIUM CHLORIDE		0.030	LBS/GAL.	7/23/01	ERI
	MAGNESIUM CHLORIDE		0.109	LBS/GAL.	7/23/01	ERI
	TOTAL CHLORIDES		2.62	LBS/GAL.	7/23/01	ERI
	WEIGHT OF 1 GALLON OF BRINE		10.15	LBS/GAL	7/23/01	ERI

ANALYSIS BY NYS LAB: 10121

$$S.G. = \frac{10.15 \text{ \#/GAL}}{8.33 \text{ \#/GAL}} = \underline{\underline{1.218}}$$

Certificate of Analysis Continued On Next Page

## Client Sample Results

Client: Bear Lake Properties, LLC  
 Project/Site: Injection Well Permitting

TestAmerica Job ID: 180-17986-1

Client Sample ID: CW 011013

Lab Sample ID: 180-17986-1

Date Collected: 01/10/13 13:30

Matrix: Water

Date Received: 01/11/13 09:30

### Method: 200.8 - Metals (ICP/MS) - Total Recoverable

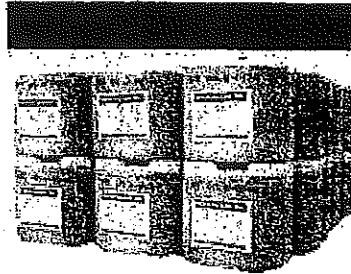
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	5200000	B	5000	44	ug/L		01/16/13 09:44	01/16/13 18:31	5
Iron	1600	JB	5000	230	ug/L		01/12/13 12:22	01/14/13 21:03	100
Magnesium	2300000	B	10000	200	ug/L		01/12/13 12:22	01/14/13 21:03	100
Manganese	10000	B	500	3.7	ug/L		01/12/13 12:22	01/14/13 21:03	100
Sodium	32000000	B	10000	270	ug/L		01/12/13 12:22	01/14/13 21:03	100

### General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	130000		1000	200	mg/L			01/12/13 11:36	1000
Alkalinity	6.5	B	5.0	0.41	mg/L			01/14/13 08:06	1
Bicarbonate Alkalinity as CaCO3	6.5	B	5.0	0.41	mg/L			01/14/13 08:06	1
Carbonate Alkalinity as CaCO3	ND		5.0	0.41	mg/L			01/14/13 08:06	1
Hardness	74000		2500	770	mg/L			01/14/13 09:05	500
Total Dissolved Solids	200000		1000	1000	mg/L			01/11/13 14:39	1
Total Organic Carbon - Duplicates	63		40	7.5	mg/L			01/21/13 11:02	40
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	6.23	HF	0.100	0.100	SU			01/15/13 09:50	1
Specific Conductance	440000		1600	1600	umhos/cm			01/11/13 18:45	1600
Total Solids	220000		10	10	mg/L			01/15/13 15:50	1

# AQUACLEAR PRODUCT INFORMATION

600 Virginia Street East, Charleston, WV 25311-3199  
 (800) 343-4792 Fax (304) 243-3215



## Corrosion Inhibitor SticksT

### WHAT ARE CORROSION INHIBITOR STICKS?

Corrosion Inhibitor SticksT are water soluble or oil soluble sticks that contain a blend of Imidazolines which have excellent filming characteristics and low emulsion tendencies. This unique blend gives effective corrosion control for most oil field corrosion problems.

### CORROSION INHIBITOR STICKS™ USES

Corrosion Inhibitor Sticks™ are primarily used to control common corrosion problems found in producing oil and gas well systems. They can be used to treat hard to reach 'dead' areas such as the annulus space above the packer, rat-hole, or the bottom of water supply tanks.

### ADVANTAGES OF CORROSION INHIBITOR STICKS

Corrosion Inhibitor SticksT can provide corrosion control throughout the entire production system. Regular usage will help control corrosion at the point they begin - down-hole.

They are available in two different formulations (oil soluble and water dispersible) or (water soluble and oil dispersible). The oil soluble type is soluble in oil, condensate and wet gas and can slowly disperse inhibitor into the water phase. The water soluble type is soluble in water and can slowly disperse inhibitor into the oil phase.

Corrosion Inhibitor SticksT can effectively inhibit corrosion in wells that produce both water and distillate or oil phases. In this case, it may be desirable to treat the well with both types of sticks by first dropping water soluble sticks and allowing them to fall through the oil into the water, thus dissolving and releasing inhibitor in

### TREATMENT DETERMINATION

The number of Corrosion Inhibitor SticksT used is based on the volume of total fluid produced (oil or condensate plus water). Field experience indicates that for most corrosive environments the best results are achieved by using a larger initial slug treatment (80 PPM daily) until the problem is under control then reduce to smaller periodic treatments (40 PPM daily) thereafter. **EXAMPLE:** An initial slug treatment of 80 PPM would require 0.64 lbs of Corrosion Inhibitor Stick™ per 24 BBL (1000 gallons) of total fluid produced.

COR. INH. STICK™ SIZES	STICKS PER BBL
SENIOR (1 5/8" x 18")	1 per 58 bbls
JUNIOR (1 3/8" x 16")	1 per 40 bbls
JUNIOR (1 1/4" x 15")	1 per 29 bbls
THRIFTY (1" x 15")	1 per 18 bbls
MIDGET (5/8" x 15")	1 per 7 bbls

**NOTE:** To successfully control any corrosion problem, the inhibitor insertion into the fluid stream must be constant. For intermittent treatment or extreme corrosive environments increase the number of sticks accordingly.

**THE MOST COMMON PROCEDURE** for producing wells is to shut-in well and drop sticks through lubricator. Leave well shut until sticks fall to the bottom. The time in minutes for the sticks to fall to the bottom (assuming well is shut-in with fluid at surface) is equal to the depth divided by 100. (Time, min. = Depth, ft / 100).

**FOR WATER INJECTION SYSTEMS** drop the sticks into the water supply tank to inhibit more of the system.

the water column). Then drop the oil soluble sticks which will "FLOAT" at where the oil and water contact thus slowly dissolving and releasing inhibitor in the oil column.

The sticks are economical when compared to conventional corrosion control operations and therefore save investment in pumps, drums of chemical, and equipment maintenance.

Corrosion Inhibitor Sticks™ may be used in wells with bottom hole temperatures (BHT) of up to 375 degrees Fahrenheit.

#### PRODUCTION SPECIFICATIONS

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#### PRODUCT PACKAGING

<b>SENIOR</b>	<b>1.55 lb/stick</b>	<b>24/case</b>	<b>31/pail</b>	<b>48/chest</b>
<b>JUNIOR(1)</b>	<b>1.20 lb/stick</b>	<b>36/case</b>	<b>n/a</b>	<b>72/chest</b>
<b>JUNIOR(2)</b>	<b>0.76 lb/stick</b>	<b>36/case</b>	<b>52/pail</b>	<b>72/chest</b>
<b>THRIFTY</b>	<b>0.49 lb/stick</b>	<b>49/case</b>	<b>72/pail</b>	<b>98/chest</b>
<b>MIDGET</b>	<b>0.19 lb/stick</b>	<b>108/case</b>	<b>204/pail</b>	<b>216/chest</b>

#### WHERE TO BUY

All good oil field supply stores carry Aqua-Clear, Inc. Corrosion Inhibitor Sticks™, but you can also buy direct from us.

## Ordering Information

Should you wish to speak to a sales representative about any of our products, you can call or email Tommy Halloran Jr., Ronald "Buster" Wilson, or Russell Cook directly:

**Tommy Halloran Jr.**

**W** 304-343-4792

**H** 304-345-5152

**C** 304-546-8526

[tom@aquaclear-inc.com](mailto:tom@aquaclear-inc.com)

**Ronald "Buster" Wilson**

**W** 304-546-8518

**H** 304-965-7996

**Fax** 304-965-2713

[buster@aquaclear-inc.com](mailto:buster@aquaclear-inc.com)

**Russell Cook**

**W** 304-546-2940

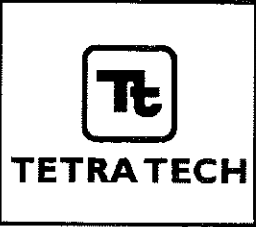
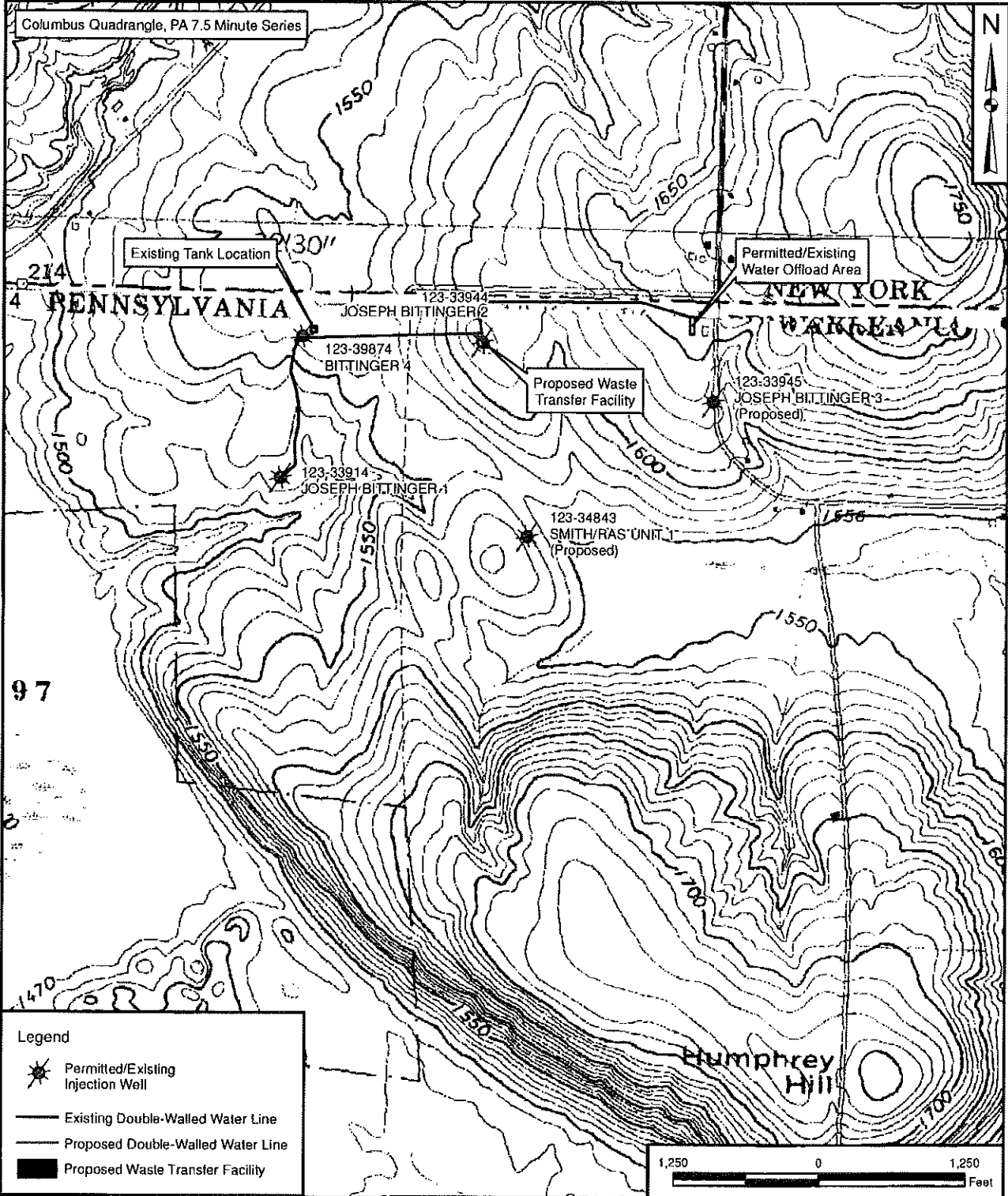
**H** 304-842-7050

**Fax** 304-842-7050

[russell@aquaclear-inc.com](mailto:russell@aquaclear-inc.com)



**OPERATING DATA**  
**FACILITY LAYOUT SCHEMATIC**

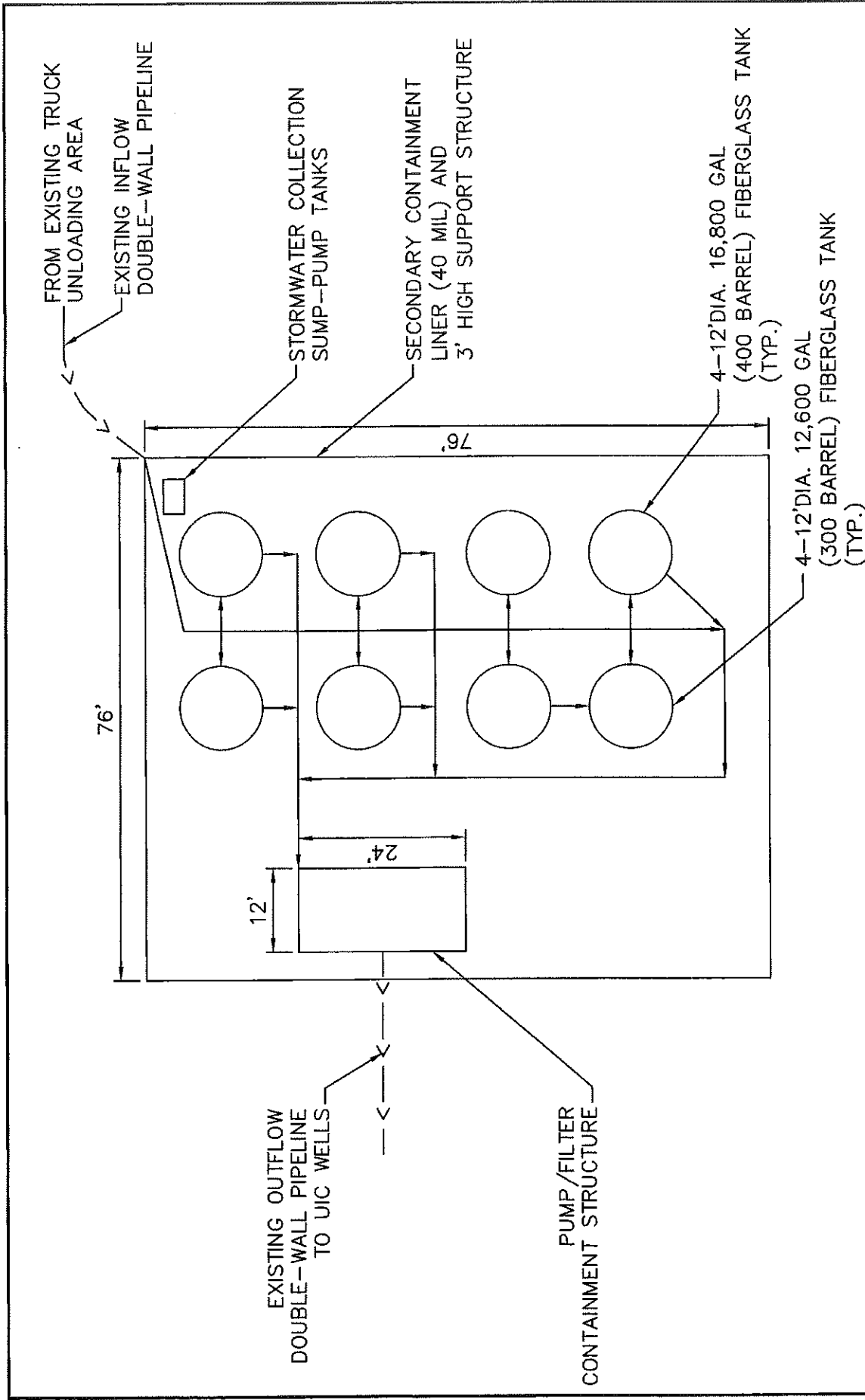


INJECTION FACILITY LAYOUT  
 JOSEPH BITTINGER 3 WELL  
 BEAR LAKE PROPERTIES, LLC  
 WARREN COUNTY, PENNSYLVANIA

DRAWN BY: S. PAXTON 02/03/15  
 CHECKED BY: D. SKOFF 02/05/15  
 APPROVED BY:

CONTRACT NUMBER: 212C-PB-00103

FIGURE NUMBER	REV
	0



DATE:	10/28/13
PROJECT NO.:	112C05908
DESIGNED BY:	CK
DRAWN BY:	CK
CHECKED BY:	
SHEET:	1 OF 1
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<b>FORM 0-1</b>	

**BEAR LAKE PROPERTIES, LLC**  
**COLUMBUS TOWNSHIP, WARREN COUNTY, PA**

**GENERAL ARRANGEMENT**  
**BEAR LAKE PROPERTIES**  
**BRINE TRANSFER FACILITY**

**TETRA TECH**

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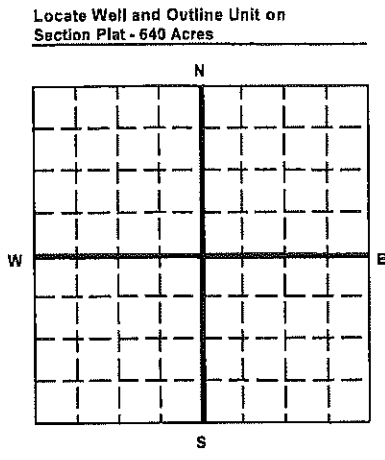
**OPERATING DATA**  
**ANNUAL OPERATING DATA REPORTS**



United States Environmental Protection Agency  
Washington, DC 20460

**ANNUAL DISPOSAL/INJECTION WELL MONITORING REPORT**

<b>Name and Address of Existing Permittee</b> Bear Lake Properties, LLC 3000 Village Run Road, Unit 103, #223, Wexford, PA 15090	<b>Name and Address of Surface Owner</b> Miles Sampsel 82530 Pangan Rd., Erie, PA 16509
--	---



State Pennsylvania	County Warren	Permit Number PAS2D215 BWAR
Surface Location Description 1/4 of 1/4 of 1/4 of 1/4 of Section Township Range		
Locate well in two directions from nearest lines of quarter section and drilling unit Surface Location ft. frm (N/S) Line of quarter section and ft. from (E/W) Line of quarter section.		
<b>WELL ACTIVITY</b> <input checked="" type="checkbox"/> Brine Disposal <input type="checkbox"/> Enhanced Recovery <input type="checkbox"/> Hydrocarbon Storage		<b>TYPE OF PERMIT</b> <input checked="" type="checkbox"/> Individual <input type="checkbox"/> Area Number of Wells
Lease Name: Bittinger		Well Number: 4

MONTH	YEAR	INJECTION PRESSURE		TOTAL VOLUME INJECTED		TUBING -- CASING ANNULUS PRESSURE (OPTIONAL MONITORING)	
		AVERAGE PSIG	MAXIMUM PSIG	BBL	MCF	MINIMUM PSIG	MAXIMUM PSIG
January-2014		1100	1440	8995		0	540
February-2014		960	1130	2716		0	0
March-2014		0	0	1474		0	0
April-2014		1200	1460	15395		0	120
May-2014		1500	1600	14586		80	120
June-2014		1550	1620	12803		80	100
July-2014		1300	1400	17838		80	100
August-2014		1380	1400	9316		80	100
September-2014		1540	1620	2434		50	150
October-2014		1580	1620	12338		60	180
November-2014		1580	1620	9840		80	200
December-2014		1590	1620	8559		80	200

**Certification**

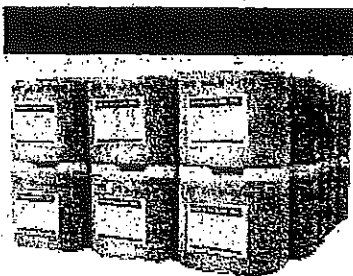
I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref. 40 CFR 144.32)

<b>Name and Official Title (Please type or print)</b> John C. Holko, Vice President	<b>Signature</b>	<b>Date Signed</b> 01/29/15
--	------------------	--------------------------------

**OPERATING DATA**  
**TYPICAL CORROSION INHIBITOR**

# AQUACLEAR PRODUCT INFORMATION

608 Virginia Street East Charleston, WV 25303-3195  
 800-438-4782 Fax 304-245-3235



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**H** 304-345-5152

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[tom@aquaclear-inc.com](mailto:tom@aquaclear-inc.com)

**Ronald "Buster" Wilson**

**W** 304-546-8518

**H** 304-965-7996

**Fax** 304-965-2713

[buster@aquaclear-inc.com](mailto:buster@aquaclear-inc.com)

**Russell Cook**

**W** 304-546-2940

**H** 304-842-7050

**Fax** 304-842-7050

[russell@aquaclear-inc.com](mailto:russell@aquaclear-inc.com)



## **Section – 7 Well Construction Details**

**WELL CONSTRUCTION**  
**INJECTION WELL CONFIGURATION**

# Figure 1 Well Construction Diagram

Bear Lake Properties, LLC  
 Bittinger #3  
 Columbus Township  
 Warren County, PA  
 37-123-33945

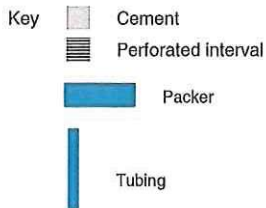
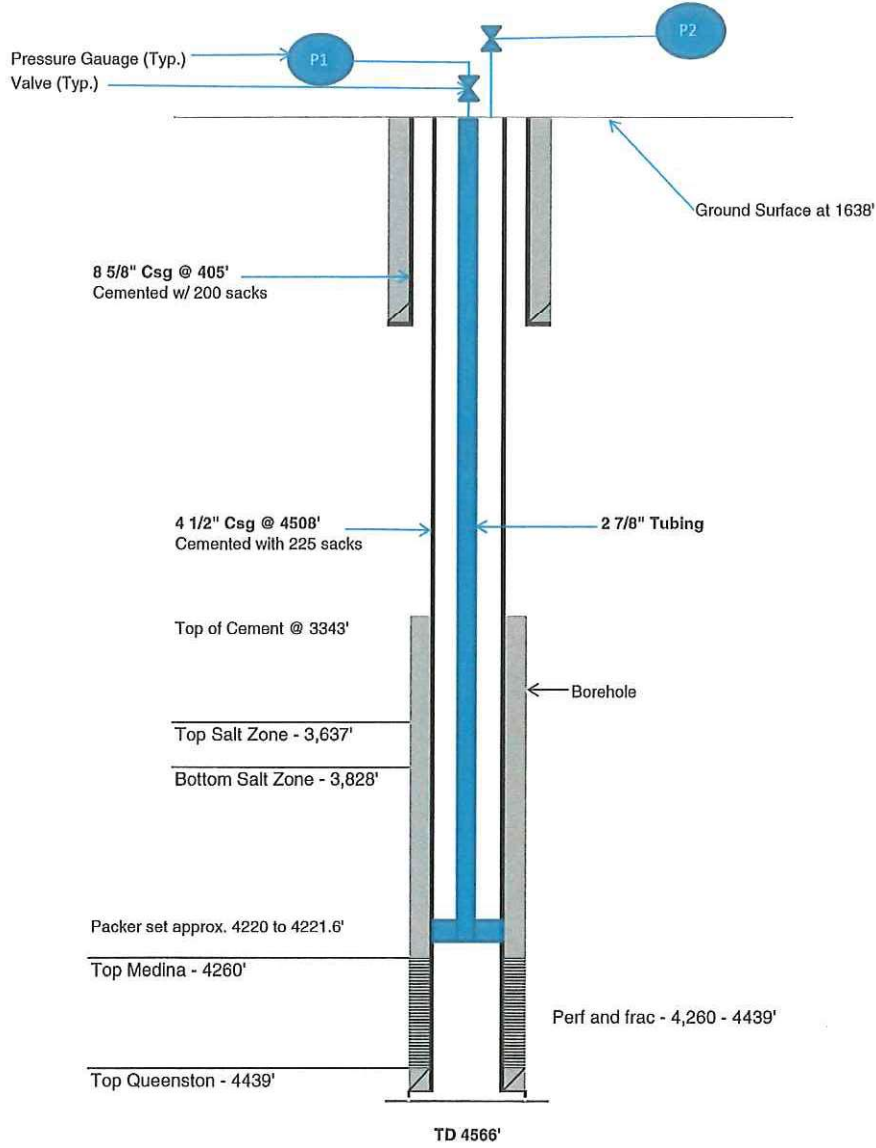


Diagram Not to Scale

**WELL CONSTRUCTION**  
**BITTINGER #3 COMPLETION RECORD**

1450' S 42° 00' 00"  
 7700' W 79° 30' 00"  
 (C)

COMMONWEALTH OF PENNSYLVANIA  
 DEPARTMENT OF ENVIRONMENTAL PROTECTION  
 DIVISION OF OIL AND GAS REGULATION  
 PITTSBURGH, PENNSYLVANIA 15222

Columbus  
 123-33945  
 Office Use Only

COMPUTERIZED

WELL RECORD

123-33945

PERMIT NO. HAR-33945

PROJECT NO. **DEEP**

TYPE OF WELL **Gas**

**COLUMBUS FIELD, DEWEY CORNERS POOL** **DEV**

WELL OPERATOR U.S. Energy Development Corporation TELEPHONE NO 716-856-9764

ADDRESS 670 Slatler Building, Buffalo, New York ZIP 14202

FARM NAME Bittinger FARM NO #3 SERIAL NO ACRES 160

TOWNSHIP Columbus COUNTY Warren

DRILLING COMMENCED 10/16/84 DRILLING COMPLETED 10/19/84

ELEVATION 1638' GL QUADRANGLE Columbus  7'  15'

CASING AND TUBING RECORD

PIPE SIZE	AMOUNT IN WELL	MATERIAL REM'D PIPE		PACKER			DATE RUN
		CEMENT (SKS)	GEL (SKS)	TYPE	SIZE	DEPTH	
13 3/8"	38'						10/16/84
8 5/8"	405'	200					10/17/84
4 1/2"	4508'	225					10/20/84

T.D.	O.D.	D.P.I.	Class	O	G	Lease
		4334	D	0	1	1

PERFORATION RECORD

STIMULATION RECORD

DATE	INTERVAL PERFORATED		DATE	INTERVAL TREATED	AMOUNT FLUID	AMOUNT SA JO	INJECTION RATE
	FROM	TO					
10/26/84	4321'	4334'	11/3/84	4321' - 4334'	1188 bbls	85000#	27 BPM

NATURAL OPEN FLOW 3000 **WHP** (net) NATURAL ROCK PRESSURE 2,534 **WHP** (net) 1225 PSI HRR 72 DAY

RE MARKS Driller's ID 4552'  
 Logger's ID 4566'  
**MEDINA**

RECEIVED

(FORMATION ON REVERSE SIDE)

JUL 12 1986

PA GEOLOGICAL SURVEY  
 (Oil & Gas Geology Division)

1/15-KE

FORMATIONS						
NAME	TOP	BOTTOM	GAS AT	OIL AT	WATER AT (FRESH OR SALT WATER)	SOURCE OF DATA
Unconsolidated Gravel	0'	30'			Fresh at 60'	Driller's records and geophysical logs
Devonian Shales	30'	2816'				
"Tully" LS	2816'	2926'				
Hamilton Shale	2926'	3097'				
Onondaga	3097'	3256'				
Unconformity Interval	3256'	3285'				
Akron-Bertie	3285'	3370'				
Camillus	3370'	3442'				
Syracuse	3442'	3641'				
Salt Zone	3637'	3828'				
Vernon	3641'	3900'				
Lockport	3900'	4108'			Salt at 4070'	
Rochester	4108'	4224'				
Irondequoit-Reynales	4224'	4260'				
Grimsby	4260'	4386'				
Power Glen	4386'	4424'				
Whirlpool	4424'	4439'				
Queenston	4439'	TO				
	4556					

November 20, 1984, 19...

DATE  
*Douglas K. Welch*  
 APPROVED BY

Douglas K. Welch, Geophysicist  
 TITLE

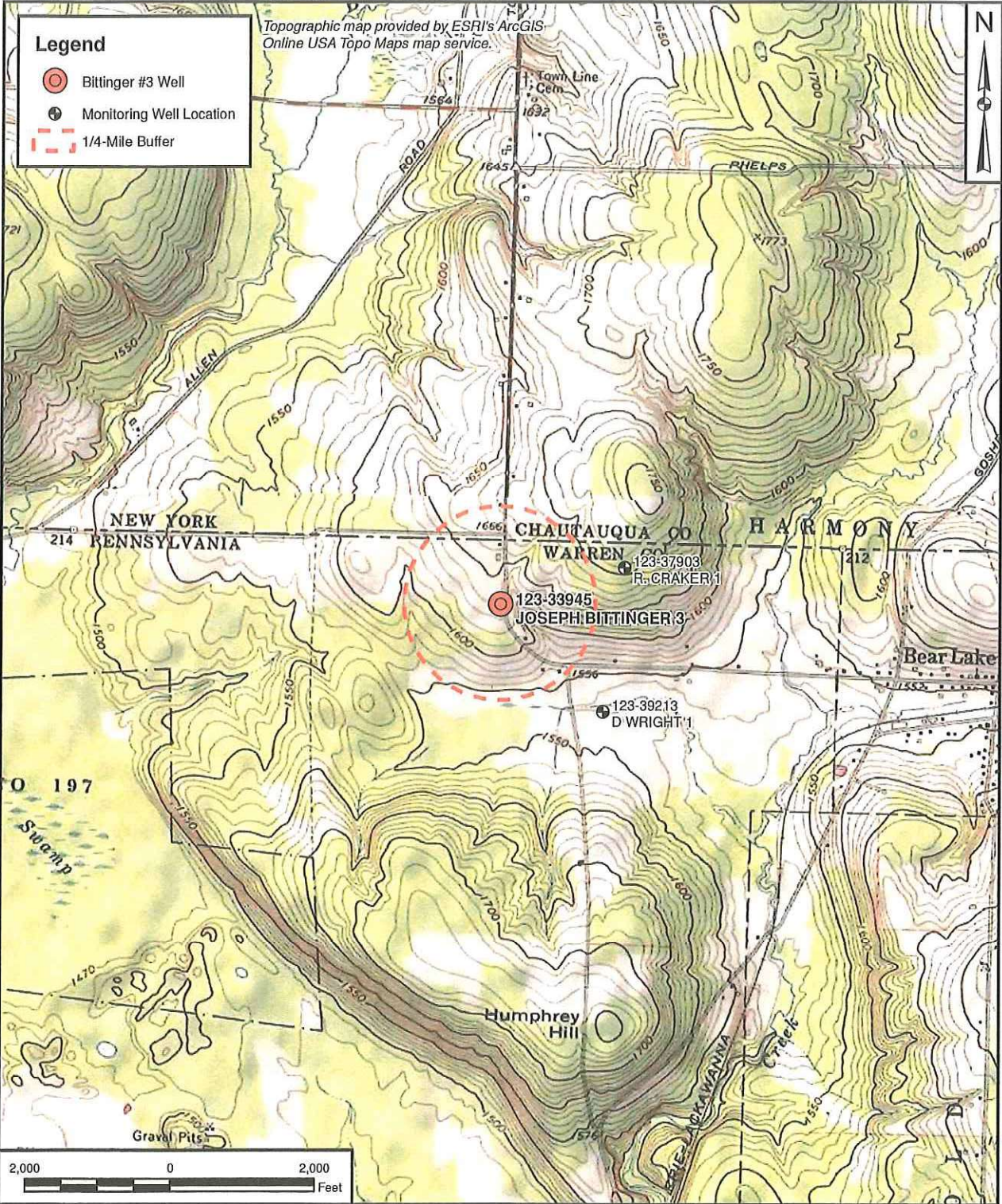
## **Section 8 – Monitoring Program**

**Section 8 - Monitoring Program**

The fluid levels in the following nearby depleted Medina natural gas wells will be measured and recorded semi-annually, at a minimum. The monitoring well locations are shown on the attached figure.

<b>Injection Well</b>	<b>Monitoring Well</b>	<b>Approximate Distance and Direction From Injection Well</b>
Bittinger #3	R. Craker #1	1,900 ft to the northeast
	D. Wright #1	2,000 ft to the southeast





MONITORING WELL LOCATIONS  
 JOSEPH BITTINGER 3 WELL  
 BEAR LAKE PROPERTIES, LLC  
 WARREN COUNTY, PENNSYLVANIA

DRAWN BY: S. PAXTON 01/27/15  
 CHECKED BY: D. SKOFF 02/03/15  
 APPROVED BY:  
 CONTRACT NUMBER: 212C-PB-00103

FIGURE NUMBER	REV
2	0

## **Section 9 – Plugging and Abandonment Plan**

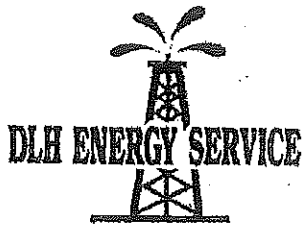
## **Section 9 - Plugging and Abandonment Plan**

At the point when the well is no longer used, the well will be abandoned in accordance with EPA and PADEP regulations. With regard to PADEP regulations, this currently includes providing a "Notice of Intent to Plug a Well" no less than 3 days and no more than 30 days prior to abandoning the well, to allow a PADEP inspector to be present during the plugging procedure. The PADEP may waive the notification period. The notification will include well location plat, well logs, production logs, injection logs, construction details, and proposed abandonment method. After receiving approval from PADEP to proceed, the well will be abandoned and the abandonment procedures will be documented on a "Certificate of Plugging".

The USEPA will be notified of the plugging activity at least 45 days prior to commencing activities. This notification will include USEPA Form No. 7514-20. A proposed plugging plan (Form 7514-20) is attached based on the current PADEP and USEPA regulations. However, this may be modified prior to plugging in order to meet the requirements at the time of the plugging activity. A contractor cost estimate to perform plugging and abandonment according to the proposed plugging plan is attached. The contractor estimate is \$30,000 for these services.

**PLUGGING AND ABANDONMENT PLAN**  
**PLUGGING AND ABANDONMENT ESTIMATED COSTS**





DLH Energy Service, LLC  
PO Box 40  
5296 Bly Hill Road  
Ashville, NY 14710  
Phone: 716-410-0204 or 716-410-0028  
Fax: 716-526-4080  
www.dlhenergyservice.com

03/18/2014

Re: Plugging Estimate for the Bittenger 2 API 37-165-3394

Dear Sirs,

The following is an estimate for the plugging to abandon the above mentioned well.

**Rig Time:**

Two twelve hour days rig at \$195/hour, crew truck \$100/day, 4<sup>th</sup> man 8 hours \$40/hr for laying down casing, **\$5,200.00**

**Wire line service:**

Jet Cut 4 1/2 casing, **\$2,500.00**

**Cement and pumping service:**

Up to 500 sacks cement and 10 hours on site pump time. Includes gel spacers between plugs. **\$17,045.00**

**Water Hauling and Disposal:**

Delivery of fresh water and removal of returned fluid **\$855.00**

**Rentals:**

500 bbl. Water tank and open top returns tank 5 day minimum **\$500.00**

**Support equipment:**

Dozer at 2 days **\$500.00**

**Trucking: mob and de mob dozer, excavator, water tank, open top, casing and tangibles (20 hrs)**

**\$1,900.00**

**Remedial Work**

Pea stone plug back with delivery, tank cleaning, excavating and cutting off surface casing, welding cap and monument, reclamation and seeding. **\$1,500.00**

**Total \$30,000.00**

If you have any questions, please feel free to contact me at (716) 410-1543.

Best Regards,

*Bill Weaver*

Bill Weaver  
Operations Supervisor  
DLH Energy Service

**PLUGGING AND ABANDONMENT PLAN**

**EPA FORM 7520-14**



United States Environmental Protection Agency  
Washington, DC 20460

**PLUGGING AND ABANDONMENT PLAN**

<b>Name and Address of Facility</b> Bittinger #2 Columbus Township, Warren County, PA	<b>Name and Address of Owner/Operator</b> Bear Lake Properties, LLC 3000 Village Run Road, Wexford, PA 15090
---	--

Locate Well and Outline Unit on Section Plat - 640 Acres 	State PA	County Warren	Permit Number
Surface Location Description 1/4 of 1/4 of 1/4 of 1/4 of Section Township Range			
Locate well in two directions from nearest lines of quarter section and drilling unit Surface Location ft. frm (N/S) Line of quarter section and ft. from (E/W) Line of quarter section.			
<b>TYPE OF AUTHORIZATION</b> <input checked="" type="checkbox"/> Individual Permit <input type="checkbox"/> Area Permit <input type="checkbox"/> Rule Number of Wells 1		<b>WELL ACTIVITY</b> <input type="checkbox"/> CLASS I <input checked="" type="checkbox"/> CLASS II <input checked="" type="checkbox"/> Brine Disposal <input type="checkbox"/> Enhanced Recovery <input type="checkbox"/> Hydrocarbon Storage <input type="checkbox"/> CLASS III	
Lease Name Bittinger		Well Number #2	

CASING AND TUBING RECORD AFTER PLUGGING				
SIZE	WT (LB/FT)	TO BE PUT IN WELL (FT)	TO BE LEFT IN WELL (FT)	HOLE SIZE
8.625	24	428	428	12.25
4.5	10.5	4457	1267	7.875
2.375	4.7	4280	0	

METHOD OF EMPLACEMENT OF CEMENT PLUGS
<input checked="" type="checkbox"/> The Balance Method
<input type="checkbox"/> The Dump Baller Method
<input type="checkbox"/> The Two-Plug Method
<input type="checkbox"/> Other

CEMENTING TO PLUG AND ABANDON DATA:							
	PLUG #1	PLUG #2	PLUG #3	PLUG #4	PLUG #5	PLUG #6	PLUG #7
Size of Hole or Pipe in which Plug Will Be Placed (Inches)	4.5	7.875	7.875				
Depth to Bottom of Tubing or Drill Pipe (ft.)	4457	3190	480				
Sacks of Cement To Be Used (each plug)	16	469	16				
Slurry Volume To Be Pumped (cu. ft.)	19	554	19				
Calculated Top of Plug (ft.)	4240	1700	430				
Measured Top of Plug (if tagged ft.)							
Slurry Wt. (Lb./Gal.)	15.6	15.6	15.6				
Type Cement or Other Material (Class III)	Class A	Class A	Class A				

LIST ALL OPEN HOLE AND/OR PERFORATED INTERVALS AND INTERVALS WHERE CASING WILL BE VARIED (if any)			
From	To	From	To
See Attached Drawing			

Estimated Cost to Plug Wells  
 \$30,000 See attached Estimate and Plugging Drawing

**Certification**

I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref. 40 CFR 144.32)

Name and Official Title (Please type or print) John C. Holko, Vice President	Signature 	Date Signed 03/19/2014
---	---------------	---------------------------

## PLUGGING AND ABANDONMENT PLAN

Bittenger #2; Columbus Township, Warren County, Pennsylvania

API/Permit: 37-165-3394

This well will be plugged using the tubing balanced plug placement method. All plugs will be set through tubing at the desired locations with a gel spacer between each plug. The cement to be used will be class A common cement mixed to 15.6 #/gal with a yield of 1.18 cubic feet per sack.

The first and deepest cement plug will be set across the injection interval from a depth of 4,240 to 4,450 feet across the existing injection interval and tagged before proceeding with additional cement plugs.

We will utilize the cement bond log run on 8/13/2013 which located the top of existing cement outside the 4.5" casing at 3,190 feet. At this point, the 4.5" casing will be cut and pulled to allow the next plugs to be placed in the open hole with OD of 7-7/8 inches. The plugs will cover all possible hydrocarbon intervals as well as providing a seal below the surface casing at 428 feet.

1. Gelled spacer will be placed between the top of the bottom plug and the bottom of the next plug from 4,240' to 3,190'.
2. A 469 sack cement plug will be used to seal from the top of the cut 4.5" casing at approximately 3,190' to above the last possible hydrocarbon zone at 1,700'. Utilizing this plug to cover the Oriskany, Marcellus, Rhinestreet and Dunkirk formations.
3. The next 16 sack plug will be placed just below the bottom of the 8-5/8" surface casing covering 50 feet from 430' to 480'

The 8-5/8" casing from surface to 430 feet will be filled with pea gravel and the top of the casing will be cut at approximately 40 inches below the surface and a plate will be welded on the top of the casing.

Any remaining equipment will be removed and the location will be restored and seeded.

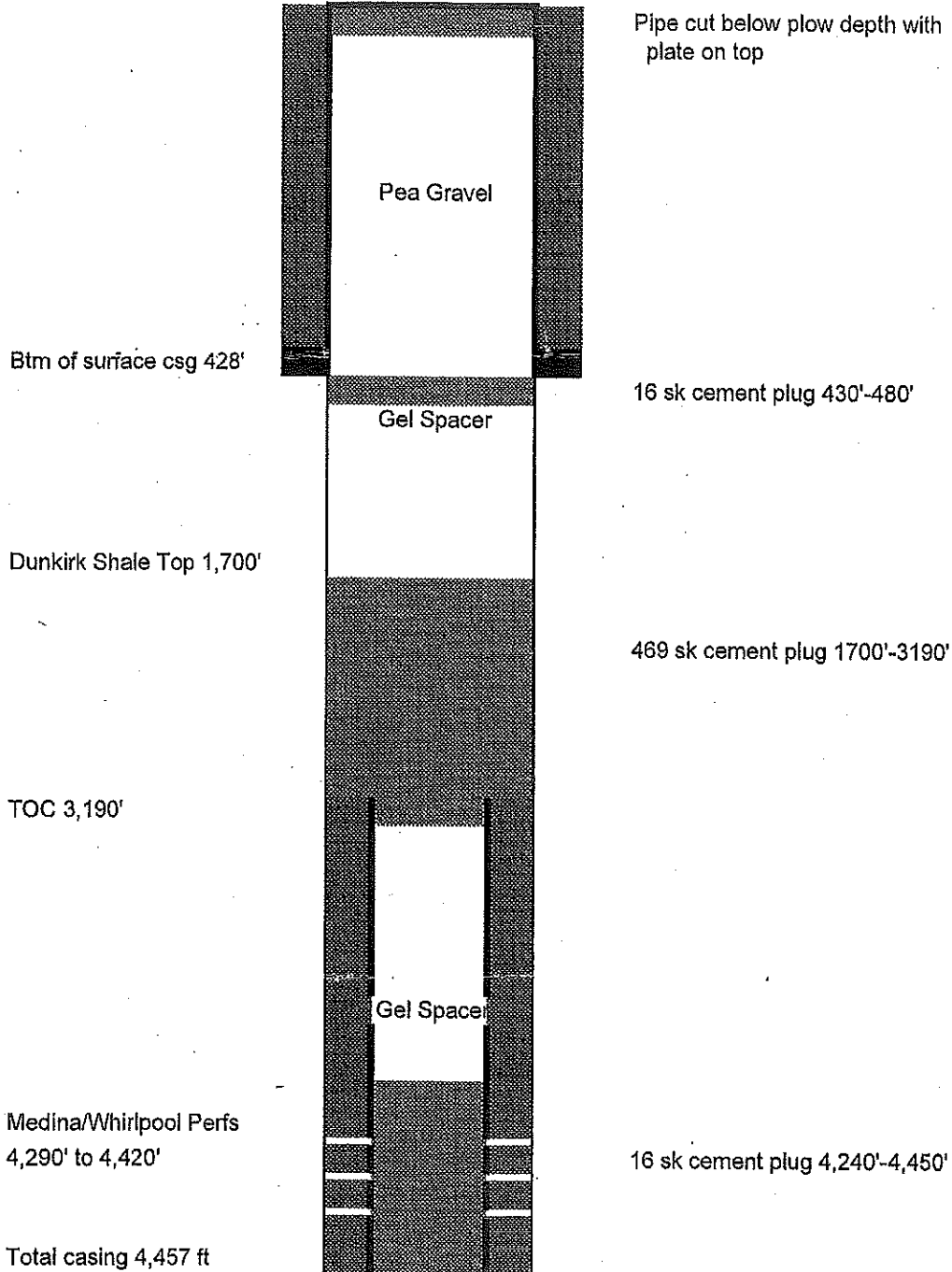


# FINAL PLUGGED WELL DRAWING

API/Permit: 37-123-33944

Bittinger #2

Pipe cut below plow depth with  
plate on top



## **Section 10 – Necessary Resources**

**Section 10 - Necessary Resources**

Bear Lake Properties, LLC will provide Certificates of Deposit (CDs) to meet necessary resources requirements for properly plugging and abandoning the well. This documentation will be provided under a separate cover at a later date.

## **Section 11 – Plan for Well Failures**

## Section 11: Plans for Well Failure

General system design and monitoring: The system being utilized for monitoring and control will function with the use of pressure switch gauges with adjustable limit switches and motor valves. The gauges provide a sensing device for changes in pressure conditions and if the limit switches are reached, they will send responses to activate motor valves controlling injection flow and pressure relief. In addition to the automated portion of the system, the manual operation of all pumping equipment as well as the continual inspections of the pumping and monitoring equipment provide additional safeguards for appropriate actions necessary in case of well failures.

Injection Pressure Limit Monitoring: The primary safeguard to prevent over pressuring is the automated shutdown on the pumping equipment at which the maximum operating pressure can be set as a limit at which all pumping will cease.

Additional switch gauges and motor valves will be utilized at the wellhead to monitor pressure changes that would be caused by tubing or casing failures and the appropriate valve will be activated to cease injection.

Tubing and Packer Monitoring: With the monitoring switch gauge connected to the tubing, we will have a secondary system to prevent over pressuring of the tubing. When the maximum pressure is sensed, a response is sent to a motor valve which will stop additional injection into the tubing.

Tubing to Casing Annulus Monitoring: This annular space will be monitored for both increase and decreases in pressure. The switch gauge will have both a low and high shutdown tab limit. When either of the limits is reached, the sensor will send a response to a motor valve shutting down flow. The lower limit will be used to monitor damage to the casing which allows fluid to leave the casing, and the high limit will sense a pressure increase in the casing that may be caused by communication with the tubing or flow into the annular space. Both of these limits when reached will send responses shutting down the injection cycle.

8-5/8" Annular Monitoring: The PADEP requires the annular valve on the 8-5/8" casing head to remain open to the atmosphere at all times. We will connect this point to a storage tank capable of collecting any fluid and allowing visual monitoring of any fluid flow. The valve and associated gauge will be monitored and inspected visually for changes or fluid flow. If such is detected, the system will be shut down and the remaining equipment associated with the system will be inspected to evaluate the cause of the changes.

Under the monitoring provided above, well failures will either be identified by the automated equipment and switch gauges or by visual inspection during injection operations or at other times. Should any failure occur, all injections will cease and proper notifications to EPA will be made. Analysis of the failure will take place and the

necessary repairs to be implemented along with any equipment replacement will be coordinated with the EPA.

**APPENDIX A**  
**SURROUNDING LANDOWNER INFORMATION**

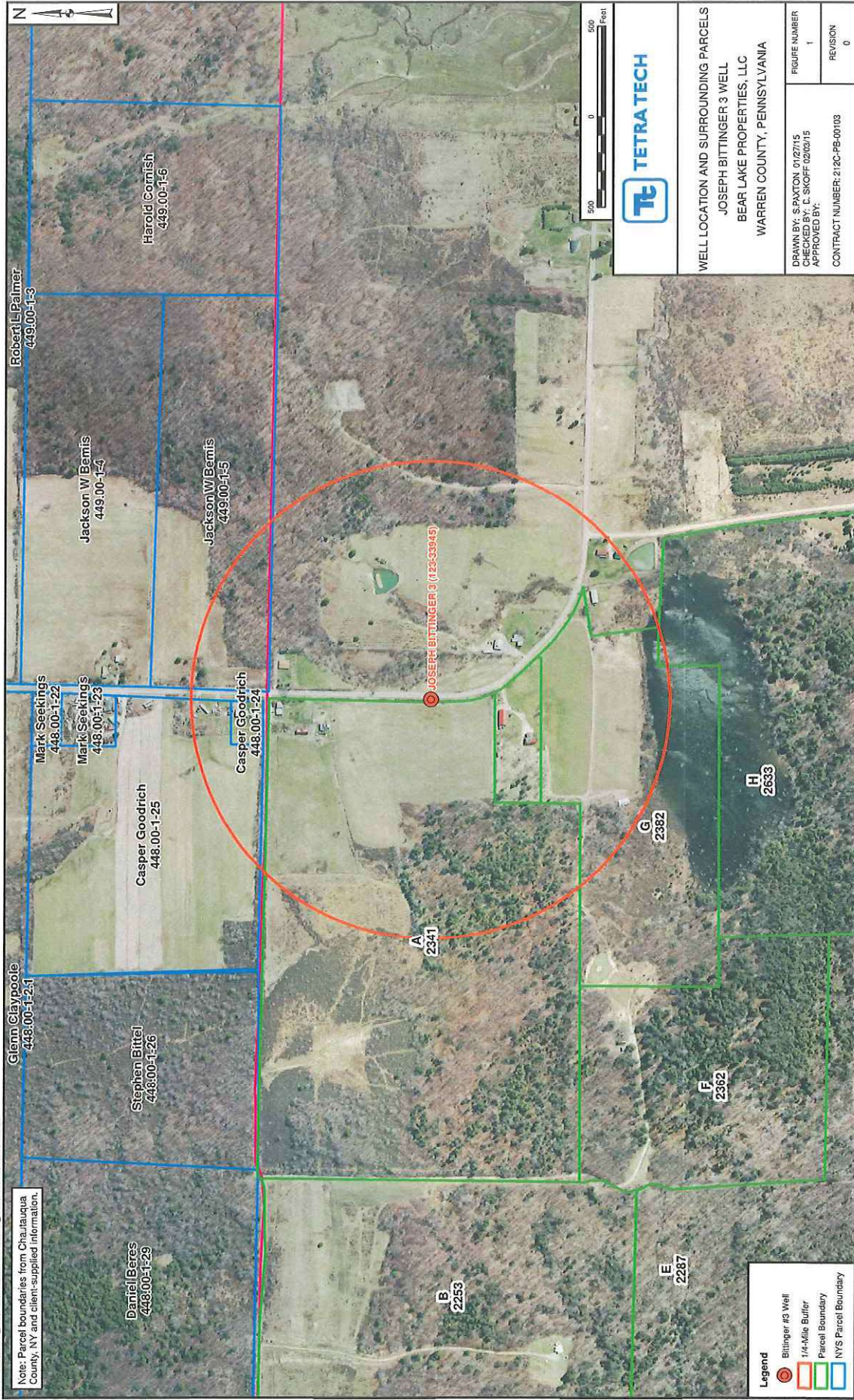
**Landowners Within 1/4 Mile of Bittinger #3 Well**

Pennsylvania Landowners		
PARCEL #	OWNER	ADDRESS
A	Bear Lake Properties, LLC	3010 Village Run, Suite 103, Wexford, PA 15090
G		
H		
	Property East of Bittinger #3	
	Property South of Bittinger #3	

New York Landowners		
OWNER	PARCEL #	ADDRESS
Casper Goodrich	448.00-1-25	5 Weeks Rd Panama NY 14767
Jackson Bemis	449.00-1-5	



Note: Parcel boundaries from Chautauqua County, NY and client-supplied information.



WELL LOCATION AND SURROUNDING PARCELS  
 JOSEPH BITTINGER 3 WELL  
 BEAR LAKE PROPERTIES, LLC  
 WARREN COUNTY, PENNSYLVANIA

DRAWN BY: S. PAXTON 01/27/15	FIGURE NUMBER
CHECKED BY: C. SKOFF 02/02/15	1
APPROVED BY:	REV./ISON
CONTRACT NUMBER: 212C-PB-00103	0

**Legend**

- Bittinger #3 Well
- 1/4-Mile Buffer
- ▭ Parcel Boundary
- ▭ NYS Parcel Boundary