

State of West Virginia
Department of Environmental Protection - Office of Oil and Gas
Well Operator's Report of Well Work

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Office of Oil and Gas

FEB 12 2015

API 47-103-02858 County Wetzel District Green **WV Department of Environmental Protection**
Quad Porters Falls Pad Name Howell Field/Pool Name EM
Farm name Howell, Charles and Ruth Well Number #4H
Operator (as registered with the OOG) Stone Energy Corporation
Address 1300 Fort Pierpont Dr. - Suite 201 City Morgantown State WV Zip 26508

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey
Top hole Northing 4,382,908 Easting 517,670
Landing Point of Curve Northing 4,382,502 Easting 517,658
Bottom Hole Northing 4,381,074 Easting 518,629

Elevation (ft) 1,302 GL Type of Well New Existing Type of Report Interim Final
Permit Type Deviated Horizontal Horizontal 6A Vertical Depth Type Deep Shallow
Type of Operation Convert Deepen Drill Plug Back Redrilling Rework Stimulate
Well Type Brine Disposal CBM Gas Oil Secondary Recovery Solution Mining Storage Other _____
Type of Completion Single Multiple Fluids Produced Brine Gas NGL Oil Other _____
Drilled with Cable Rotary

Drilling Media Surface hole Air Mud Fresh Water Intermediate hole Air Mud Fresh Water Brine
Production hole Air Mud Fresh Water Brine

Mud Type(s) and Additive(s)
Saturated salt mud which includes Caustic Soda, Barite, Lime, New-Drill, Perma-Lose HT, Xan-Plex D, X-Cide 102, Soda Ash, and Sodium Chloride

Date permit issued 3/27/2013 Date drilling commenced 2/8/2013 Date drilling ceased 10/20/2013
Date completion activities began 1/31/2014 Date completion activities ceased 7/31/2014
Verbal plugging (Y/N) N Date permission granted _____ Granted by _____

Please note: Operator is required to submit a plugging application within 5 days of verbal permission to plug

Freshwater depth(s) ft None Reported Open mine(s) (Y/N) depths N
Salt water depth(s) ft None Reported Void(s) encountered (Y/N) depths N
Coal depth(s) ft 1,060 Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) N

Reviewed by:
A.L. 5/19/15
W.S. 6/01/15
06/12/2015

API 47- 103 - 02858 Farm name Howell, Charles and Ruth Well number #4H

CASING STRINGS	Hole Size	Casing Size	Depth	New or Used	Grade wt/ft	Basket Depth(s)	Did cement circulate (Y/N) * Provide details below*
Conductor	24"	20"	97'	New	LS		Y - GTS
Surface	17.5"	13.375"	1,312' KB 1,297' GL	New	J55	169' & 254'	Y - CTS
Coal	17.5"	13.375"	1,312' KB 1,297' GL	New	J55	169' & 254'	Y - CTS
Intermediate 1	12.25"	9.625"	2,485'	New	J55		Y - CTS
Intermediate 2							
Intermediate 3							
Production	8.75"	5.5"	13,238'	New	P110		N - TOC @ 410'
Tubing	N/A	2.375"	7,303'	New	N80		N/A
Packer type and depth set							

Comment Details Circulated 40 bbls cement to surface on the 13-3/8". Circulated 46 bbls cement to surface on the 9.625". Cement top on the 5.5" production casing is at 410'.

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft ³ /sks)	Volume (ft ³)	Cement Top (MD)	WOC (hrs)
Conductor	Type 1	34	15.6	1.18	40	Surface	24.0
Surface	Class "A"	990	15.6	1.19	1,178	Surface	8.0
Coal	Class "A"	990	15.6	1.19	1,178	Surface	8.0
Intermediate 1	Lead-FlexSeal Tail-Class "A"	Lead-420 Tail-420	Lead-15.0 Tail-15.6	Lead-1.27 Tail-1.19	Lead-533 Tail-500	Surface	12.0
Intermediate 2							
Intermediate 3							
Production	Lead-GasStop Tail-Class "A"	Lead-703 Tail-2,062	Lead-15.0 Tail-15.6	Lead-1.25 Tail-1.19	Lead-879 Tail-2,454	410'	8.0
Tubing							

Drillers TD (ft) 13,240 MD / 6,975 TVD Loggers TD (ft) N/A
 Deepest formation penetrated Marcellus Shale Plug back to (ft) _____
 Plug back procedure _____

Kick off depth (ft) 5,979 MD/ 5,954 TVD

Check all wireline logs run caliper density deviated/directional induction
 neutron resistivity gamma ray temperature sonic

Well cored Yes No Conventional Sidewall Were cuttings collected Yes No

DESCRIBE THE CENTRALIZER PLACEMENT USED FOR EACH CASING STRING Surface/Coal casing had bow spring centralizers placed on joints #s 3, 5, 7, 9, 11, 13, 15, 18, 20, 22, and 24. Intermediate casing had bow spring centralizers placed on joints #s 5, 8, 10, 12, 14, 16, 19, 21, 24, 26, 28, 30, 32, 35, 38, 43, 46, 49 and 52. One straight blade rigid centralizer was placed on joint #55. Production casing had left/right rigid spiral centralizers were placed beginning on joint #1 and then every fourth joint up to the top of curve at joint #240. From there bow spring centralizers were placed beginning on joint #248 and then every eighth joint up to joint #304. A total of 61 rigid left/right centralizers were used and 8 bow spring centralizers were used.
The joint numbers begin at TD of each individual casing string and increase as you increase as you come up the hole.

WAS WELL COMPLETED AS SHOT HOLE Yes No DETAILS _____

WAS WELL COMPLETED OPEN HOLE? Yes No DETAILS _____

WERE TRACERS USED Yes No TYPE OF TRACER(S) USED _____

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PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)
1	2/11/14	12,942	13,132	72	Marcellus Shale
2	3/28/14	12,720	12,863	72	Marcellus Shale
3	3/29/14	12,505	12,653	72	Marcellus Shale
4	3/30/14	12,298	12,433	72	Marcellus Shale
5	3/31/14	12,080	12,233	72	Marcellus Shale
6	4/1/14	11,878	12,018	72	Marcellus Shale
7	4/2/14	11,665	11,808	72	Marcellus Shale
8	4/3/14	11,457	11,597	72	Marcellus Shale
9	4/5/14	11,245	11,388	72	Marcellus Shale
10	4/6/14	11,038	11,182	72	Marcellus Shale
11	4/7/14	10,832	10,968	72	Marcellus Shale
12	4/9/14	10,620	10,758	72	Marcellus Shale
13	4/10/14	10,409	10,548	72	Marcellus Shale
14	4/11/14	10,202	10,343	72	Marcellus Shale
15	4/12/14	9,994	10,133	72	Marcellus Shale
16	4/13/14	9,775	9,926	72	Marcellus Shale

Please insert additional pages as applicable.

STIMULATION INFORMATION PER STAGE

Complete a separate record for each stimulation stage.

Stage No.	Stimulations Date	Ave Pump Rate (BPM)	Ave Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbls)	Amount of Nitrogen/other (units)
1	3/28/14	85.4	7,650	9,106	4,603	348,945	330,065	
2	3/29/14	85.4	7,730	6,785	5,119	370,960	318,915	
3	3/30/14	85.6	7,676	6,923	5,148	372,279	313,831	
4	3/31/14	84.8	7,548	5,910	5,120	380,920	326,718	
5	4/1/14	85.8	7,609	6,976	4,718	383,141	316,822	
6	4/2/14	85.1	7,697	6,524	4,173	382,980	317,682	
7	4/3/14	82.9	7,305	5,565	4,344	374,420	316,135	
8	4/5/14	81.4	7,353	6,311	5,723	389,300	632,415	
9	4/6/14	83.2	7,453	5,607	5,091	379,220	314,468	
10	4/7/14	80.3	7,127	6,630	4,718	380,500	319,100	
11	4/9/14	80.4	7,022	6,225	4,947	377,180	314,135	
12	4/10/14	80.7	7,136	7,212	5,148	366,559	310,618	
13	4/11/14	80.7	6,950	5,839	4,487	392,538	317,910	
14	4/12/14	80.4	7,012	5,718	4,286	380,605	315,101	
15	4/13/14	79.2	6,381	6,047	4,575	376,239	311,802	
16	4/16/14	80.3	6,455	6,874	4,603	382,349	315,640	

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Please insert additional pages as applicable.

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PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)
17	4/15/14	9,570	9,708	72	Marcellus Shale
18	4/16/14	9,347	9,503	72	Marcellus Shale
19	4/17/14	9,131	9,278	72	Marcellus Shale
20	4/20/14	8,917	9,063	72	Marcellus Shale
21	4/21/14	8,705	8,848	72	Marcellus Shale
22	4/22/14	8,495	8,635	72	Marcellus Shale
23	4/23/14	8,290	8,428	72	Marcellus Shale
24	4/24/14	8,080	8,229	72	Marcellus Shale
25	4/25/14	7,865	8,016	72	Marcellus Shale
26	4/27/14	7,660	7,803	72	Marcellus Shale
27	4/29/14	7,535	7,581	72	Marcellus Shale

Please insert additional pages as applicable.

STIMULATION INFORMATION PER STAGE

Complete a separate record for each stimulation stage.

Stage No.	Stimulations Date	Ave Pump Rate (BPM)	Ave Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbls)	Amount of Nitrogen/other (units)
17	4/16/14	80.7	6,343	6,818	4,947	377,484	315,211	
18	4/17/14	80.0	6,645	5,829	4,860	374,404	311,981	
19	4/20/14	80.2	6,552	5,239	4,831	374,100	325,848	
20	4/21/14	80.1	6,284	5,245	5,262	373,500	309,957	
21	4/22/14	80.6	5,965	5,335	5,061	376,580	310,980	
22	4/23/14	80.5	6,009	5,640	5,204	377,460	315,468	
23	4/24/14	78.9	6,535	4,818	5,062	375,960	315,572	
24	4/25/14	79.4	6,219	6,214	4,950	378,220	312,756	
25	4/27/14	79.4	6,390	6,600	4,918	371,140	311,004	
26	4/29/14	80.2	6,296	6,896	5,464	376,080	309,760	
27	4/30/14	79.9	6,651	6,902	4,775	373,860	309,514	

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Please insert additional pages as applicable.

HOWELL #4H
 API 47-103-02858
 Stone Energy Corporation

	Horizontal				
	Top (ft TVD)	Top (ft MD)			
Sandstone & Shale	Surface		*	1,060	No Fw Reported
Coal	1,060		*	1,064	
Sandstone & Shale	1,064		*	2,146	No SW Reported
Little Lime	2,146		*	2,200	
Big Lime	2,200		*	2,253	
Big Injun	2,253		*	2,296	
Sandstone & Shale	2,296		*	2,851	
Berea Sandstone	2,851		*	2,881	
Shale	2,881		*	3,045	
Gordon	3,045		*	3,095	
Undiff Devonian Shale	3,095		*	6,192	6,225
Rhinestreet	6,192	6,225	~	6,624	6,723
Cashaqua	6,624	6,723	~	6,793	6,954
Middlesex	6,793	6,954	~	6,825	7,003
West River	6,825	7,003	~	6,883	7,106
Geneseo	6,883	7,106	~	6,901	7,142
Tully Limestone	6,901	7,142	~	6,931	7,214
Hamilton Shale	6,931	7,214	~	6,976	7,351
Marcellus	6,976	7,351	~	6,975	13,240
TD				6,975	13,240

* From Pilot Hole Log and Driller's Log

~ From MWD Gamma Log

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Hydraulic Fracturing Fluid Product Component Information Disclosure

Fracture Date:	4/30/2014
State:	West Virginia
County/Parish:	Wetzel County
API Number:	
Operator Name:	Stone Energy
Well Name and Number:	Howell 4H
Longitude:	
Latitude:	
Long/Lat Projection:	
Production Type:	
True Vertical Depth (TVD):	0
Total Water Volume (gal)*:	8838726

Hydraulic Fracturing Fluid Composition

Trade Name	Supplier	Purpose	Ingredients	Chemical Abstract Service Number (CAS #)	Maximum Ingredient Concentration in Additive (% by mass)**	Maximum Ingredient Concentration in HF Fluid (% by mass)**	Comments
H015, Slickwater, WF115	Schlumberger	Corrosion Inhibitor, Bactericide (Myacide GA25), Friction Reducer, Scale Inhibitor, AntiFoam Agent, Surfactant, Acid, Breaker, Gelling Agent, Iron Control Agent, Clay Control Agent, Buffer, Accelerator, Propping Agent, Fluid Loss Additive	Water (Including Mix Water Supplied by Client)*	NA		87.72740%	
			Crystalline silica	14808-60-7	98.41421%	12.07799%	
			Hydrochloric acid	7647-01-0	0.86317%	0.10593%	
			Carbohydrate polymer	Proprietary	0.47810%	0.05867%	
			Ammonium sulfate	Proprietary	0.11885%	0.01459%	
			Polyethylene glycol monohexyl ether	31726-34-8	0.07188%	0.00882%	
			Distillates (petroleum), hydrotreated light	64742-47-8	0.05886%	0.00722%	
			Glutaraldehyde	111-30-8	0.05412%	0.00664%	
			Calcium chloride	10043-52-4	0.05123%	0.00629%	
			Diammonium peroxydisulfate	7727-54-0	0.02335%	0.00287%	
			Ammonium chloride	12125-02-9	0.01913%	0.00235%	
			Urea	57-13-6	0.01332%	0.00164%	
			Dicoco dimethyl quaternary ammonium chloride	61789-77-3	0.00553%	0.00068%	
			Ethane-1,2-diol	107-21-1	0.00417%	0.00051%	
			Trisodium ortho phosphate	7601-54-9	0.00417%	0.00051%	
			Methanol	67-56-1	0.00340%	0.00042%	
			Sodium erythorbate	6381-77-7	0.00320%	0.00039%	
			Aliphatic acids	Proprietary	0.00255%	0.00031%	
			Aliphatic alcohols, ethoxylated #2	Proprietary	0.00255%	0.00031%	
			Sodium carbonate	497-19-8	0.00145%	0.00018%	
			Prop-2-yn-1-ol	107-19-7	0.00085%	0.00010%	
			Polypropylene glycol	25322-69-4	0.00024%	0.00003%	

* Total Water Volume sources may include fresh water, produced water, and/or recycled water

** Information is based on the maximum potential for concentration and thus the total may be over 100%

Report ID: RPT-27079 (Generated on 5/13/2014 3:41 PM)

All component information listed was obtained from the supplier's Material Safety Data Sheets (MSDS). As such, the Operator is not responsible for inaccurate and/or incomplete information. Any questions regarding the content of the MSDS should be directed to the supplier who provided it. The Occupational Safety and Health Administration's (OSHA) regulations govern the criteria for the disclosure of this information. Please note that Federal Law protects "proprietary", "trade secret", and "confidential business information" and the criteria for how this information is reported on an MSDS is subject to 29 CFR 1910.1200(i) and Appendix D.

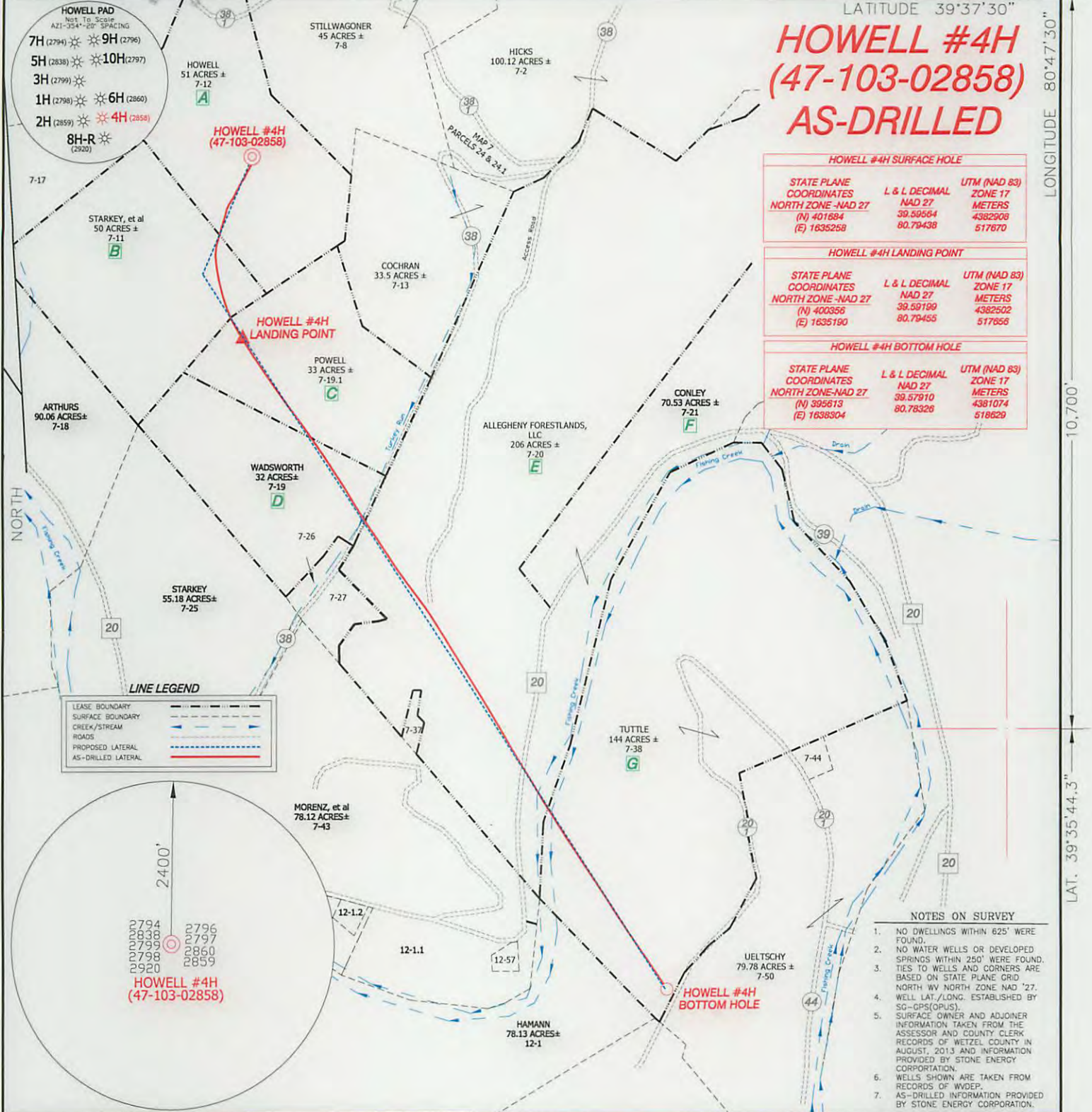
Office of Oil and Gas

FEB 12 2015

WV Department of
Environmental Protection

06/12/2015

HOWELL #4H (47-103-02858) AS-DRILLED



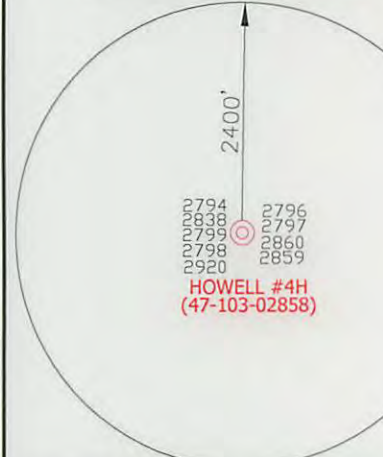
HOWELL #4H SURFACE HOLE		
STATE PLANE COORDINATES	L & L DECIMAL	UTM (NAD 83)
NORTH ZONE - NAD 27	NAD 27	ZONE 17
(N) 401684	39.59564	METERS
(E) 1635258	80.79438	4382908
		517670

HOWELL #4H LANDING POINT		
STATE PLANE COORDINATES	L & L DECIMAL	UTM (NAD 83)
NORTH ZONE - NAD 27	NAD 27	ZONE 17
(N) 400356	39.59199	METERS
(E) 1635190	80.79455	4382502
		517656

HOWELL #4H BOTTOM HOLE		
STATE PLANE COORDINATES	L & L DECIMAL	UTM (NAD 83)
NORTH ZONE - NAD 27	NAD 27	ZONE 17
(N) 395613	39.57910	METERS
(E) 1638304	80.78326	4381074
		518626

LINE LEGEND

LEASE BOUNDARY	---
SURFACE BOUNDARY	---
CREEK/STREAM	---
ROADS	---
PROPOSED LATERAL	---
AS-DRILLED LATERAL	---



- NOTES ON SURVEY**
- NO DWELLINGS WITHIN 625' WERE FOUND.
 - NO WATER WELLS OR DEVELOPED SPRINGS WITHIN 250' WERE FOUND. TIES TO WELLS AND CORNERS ARE BASED ON STATE PLANE GRID NORTH WV NORTH ZONE NAD '27.
 - WELL LAT./LONG. ESTABLISHED BY SG-GPS(OPUS).
 - SURFACE OWNER AND ADJOINER INFORMATION TAKEN FROM THE ASSESSOR AND COUNTY CLERK RECORDS OF WETZEL COUNTY IN AUGUST, 2013 AND INFORMATION PROVIDED BY STONE ENERGY CORPORATION.
 - WELLS SHOWN ARE TAKEN FROM RECORDS OF WDEP.
 - AS-DRILLED INFORMATION PROVIDED BY STONE ENERGY CORPORATION.

I THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAT IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AND SHOWS ALL THE INFORMATION REQUIRED BY LAW AND THE RULES ISSUED AND PRESCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.



(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS.
 DATE OCTOBER 15, 20 14
 OPERATORS WELL NO. HOWELL #4H
 API WELL NO. 47-103-02858
 STATE COUNTY PERMIT

P.S. 834

 HUPP Surveying & Mapping
 P.O. Box 647 Grantsville, WV 26147
 (304) 354-7035 EMAIL: hupp@frontiernet.net

MINIMUM DEGREE OF ACCURACY 1/2500 FILE NO. W2208 (BK 64-54)
 PROVEN SOURCE OF ELEVATION SG-GPS(OPUS) SCALE 1" = 1000'

STATE OF WEST VIRGINIA
 DIVISION OF ENVIRONMENTAL PROTECTION
 OFFICE OF OIL AND GAS

WELL TYPE : OIL GAS LIQUID INJECTION WASTE DISPOSAL IF "GAS" PRODUCTION STORAGE DEEP SHALLOW

LOCATION :
 ELEVATION 1304' WATERSHED FISHING CREEK
 DISTRICT GREEN COUNTY WETZEL QUADRANGLE PORTERS FALLS 7.5'

SURFACE OWNER CHARLES & RUTH HOWELL ACREAGE 51±
 ROYALTY OWNER CHARLES & RUTH HOWELL, et al LEASE ACREAGE 516.00± **06/12/2015**

PROPOSED WORK :
 DRILL CONVERT DRILL DEEPER REDRILL FRACTURE OR STIMULATE PLUG OFF OLD FORMATION PERFORATE NEW FORMATION PLUG AND ABANDON CLEAN OUT AND REPLUG OTHER

PHYSICAL CHANGE IN WELL (SPECIFY) _____ TARGET FORMATION MARCELLUS
 ESTIMATED DEPTH TVD 6,975' MD 13,240'

WELL OPERATOR STONE ENERGY CORPORATION DESIGNATED AGENT TIM MCGREGOR
 ADDRESS P.O. BOX 52807 LAFAYETTE, LA 70508 ADDRESS 1300 FORT PIERPONT DR., SUITE 201 MORGANTOWN, WV 26508

COUNTY NAME PERMIT