WELL RECORD 63963

Iowa Department of Natural Resources – Geological Survey
109 Trowbridge Hall, Iowa City, IA 52242-1319 PH (319) 335-1575

PWTS Well No. _____ PWTS Permit No. _____ County Permit No. _____

Site identification

Property Owner City of Bayard, Iowa Other ID Well #3
Address 301 Third St., Bayard, Iowa 50029
Tenant N/A
Well Depth 191 ft Date completed 3/22/07

Location

County Guthrie

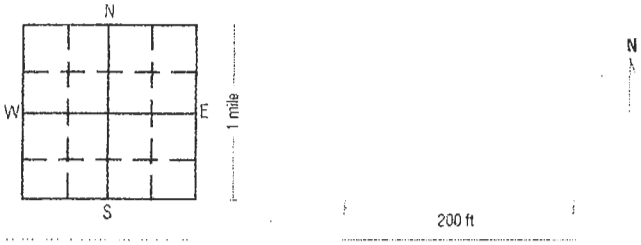
_____ mi. N/S and _____ mi. E/W of intersection of _____ and _____

NE 1/4 of the SW 1/4 of the SE 1/4 of Sec 3 TWP 81N RNG 32 E/W

GPS Coordinates (NAD83 datum only) decimal degrees:

_____ N. Latitude _____ W. Longitude.

Show exact location of well in section grid with a dot (•). Sketch map of well location on property.



☐ upland ☐ hillside ☐ valley ☒ level surface Elevation (if known) _____

Formation log

From	To	Color	Hardness	Formation description
0	5			Till
5	25			Till + brown clay
25	40	Gray		Clay; cobbles at 25'-35'
40	50			Fine to medium gravel
50	99	Gray		Clay; shale streaks at 75-99
99	104	Brown		Shale; coarse sand streak
104	129	Red		Shale; boulder at 128
129	138	Gray		Shale; Sandstone at 132 & 136
138	155	Brown		Sandstone
155	168	Brown		Sandstone; very fine grain
168	183	Brown		Sandstone w/ red shale
183	184	Brown		Hard sandstone; shale
184	189	Brown		Sandstone; shale; coal
189	193	Brown		Soft sandstone; shale; coal

use additional sheets as needed

Remarks (including depth of lost drilling fluids, materials, or tools)
Very hard sandstone at 142', 150', and 162-164
Drilled reverse-circulation rotary

Well use

☐ Domestic ☐ Livestock ☐ Test well ☐ Heat pump ☒ Municipal ☐ Public supply ☐ Irrigation ☐ Commercial ☐ Monitoring ☐ Other _____

Drill method

☒ rotary ☐ auger ☐ cable other _____

Hole size

15 inch from 0 ft to 193 ft

hole size continued: _____ inch from _____ ft to _____ ft

_____ inch from _____ ft to _____ ft

_____ inch from _____ ft to _____ ft

Record all depth measurements from ground level (GL). Use (+) for above GL measurements.

Casing

Drive shoe (yes / no) Pitless adapter (yes / no)

Size (ID/OD)	Type / Wt	Depth top	Depth bottom	Amount (length)
8" I.D.		+1	146	147

Perforated or slotted casing? (yes / no)

Perforated / slotted from _____ ft to _____ ft

Perforated / slotted from _____ ft to _____ ft

Casing grouted? (yes / no)

Placement method Tremie pipe

Type	Depth top	Depth bottom	Amount (vol/wt)
Cement grout	0	135	
Bentonite seal	135	140	

Well screen? (yes / no)

Diameter	Slot size	Depth top	Depth bottom	Length	Material
8"	0.030	146	191	45'	Stainless Steel
	0.___				

Bottom capped (yes / no) with Stainless Steel Plate

Seals / Packers (yes / no) kind _____ depth _____ ft

Gravel packed (yes / no) from 140 ft to 191 ft

type Red Flint #30 amount 5,000 lbs.

Well developed? (yes / no)

Explain Airlifted for 7¼ hours

(pumped / airlifted / bailed) for 8 hrs at 68 GPM

Pump installed? (yes / no)

Date ___/___/___

Installer's name _____

Type of pump _____ Depth to intake _____ ft

Pump diameter _____ Rated capacity _____ GPM

Water information

Aquifer: ☐ sand / gravel ☐ limestone ☒ sandstone

Main water-supply zone from 146 ft to 191 ft ☐ seepage well

Static water level 56 ft (below / above) GL: ☐ tape ☐ airline ☒ E-line ☐ estimate

Pumping water level 129 ft below GL: ☐ tape ☐ airline ☒ E-line ☐ estimate

At yield of 68 GPM: ☐ orifice ☐ volumetric ☐ estimate for 8 hours

Measurements taken at 2:00 (AM / PM) Date 4/6/07

Water quality test? (yes / no)

Date tested 5/4/07

Tested by Cahoy Pump Service

Contractor Cahoy Pump Service

Address 411 E. Main St., Fredericksburg, Iowa 50630

Driller Darin J. Cahoy Certification no. 1786

Send original form to: **Iowa Department of Natural Resources – Geological Survey**

Make photocopies for: **Well Contractor, Customer, and County Health Department**

DRILLER'S LOG

PROJECT: Bayard, IA WELL #: 3" Test Hole

DATE STARTED: 9-26-06 DATE COMPLETED:

Water meter 270710 Start End

ROD#	LENGTH	DEPTH	FORMATION DESCRIPTIONS	DEPTH STARTED	DEPTH ENDED
Kelly	24' bit +1	0-5'	till		25'
		5'-25'	brown clay & till		
1st	10'	25-35'	gray clay & few cobbles		35'
2nd	21'	35-40'	gray clay		40'
Set	16" below casing @ 40'		14.75" roller & extention bit		
1st	21'	40'-47'	fine to medium gravel		47'
2nd	21'	47-50'	fine to medium gravel		68'
		50-68'	gray clay		
3rd	21'	68-75'	gray clay		89'
		75-89'	gray clay/shale? penetration rates increased		
4th	21'	89'-99'	gray clay/shale?		99'
		99'-104'	Brown Shale with coarse sand		104'
		104'-110'	Red Shale		110'
5th	21'	110'-116'	Red shale		131'
		116'-126	Red & gray shale		
		126-128.5	Red gray shale & granite boulder took 3 1/4 hr to drill thru boul		
		128.5-131'	gray & red shale		
6th	21	131-132	gray shale		152'
		132'-133'	Sandstone layer		
		133'-136	gray shale		
		136-137'	sandstone layer		
		137'-138'	gray shale		
		138-142'	Extremely tough Sandstone		
		142'-143'	Extremely tough Sandstone		
		143-150'	Sandstone		
		150-151'	Extremely hard sandstone		
		151-152'	Sandstone		
7th	21	152-155'	Sandstone		173'
		155-162'	Super Sandstone (Pounding)		
		162'-164'	Extremely hard sandstone red shale		
		164-168	Super sandstone		
		168-173'	sandstone & red shale		

EQUIPMENT TYPE	HOURS beginning	Hours Ending
471 Detroit	4685	4719.3
5.9 Cummins	885	974.8
Generator		
Compressor	2174	2238
Welder # 1	1138	1179
Dump Truck	5931	5972

Well location

N. ° ' "

W. ° ' "

Alt. Ft

Well size: Bore 24" @ 40' 14.75" @ 40'-220'

casing 16" to 40'

DRILLER'S LOG

PROJECT: Bayard, IA WELL #: 3 "Test Hole"

DATE STARTED: 9-26-06 DATE COMPLETED:

ROD#	LENGTH	DEPTH	FORMATION DESCRIPTIONS	DEPTH STARTED	DEPTH ENDED
8	21'	173-183	sandstone & red shale		194'
		183-184	hard sandstone/shale/cobble		
		184-187	med-hard sandstone-some clay/coal		
		187-189	med sandstone/shale/coal		
		189-190	soft to med sandstone/shale		
		190'-193'	soft sandstone/coal		
		193-194	gray shale-tacky		
9'	21'	194'-205'	gray shale		210
		205-210	gray med cst brown shale w/bit rocks		

EQUIPMENT TYPE	HOURS
	See
471 Detroit	1st
5.9 Cummins	page
Generator	
Compressor	
Welder #	

Well location

N. ° ' "

W. ° ' "

Ft

Well size Bore / Casing

NORTHWAY WELL AND PUMP COMPANY

4895 8TH AVENUE MARION, IOWA 52302
319-377-6339 1-800-747-6339

TEST HOLE REPORT

Name City of Bayard

Job No. W-531 Date 12/20/2006

City Bayard State Iowa

TEST HOLE NUMBER 1-06

Driller Mary Anderson

Test Hole Location 10-feet south of new well.

TEST LOG

FROM	TO	MARSH FUNNEL VISCOSITY SECONDS	MUD PIT LOSS INCHES	Static Water Level _____ Measured _____ Hours After Completion FORMATION
0	6			Brown sandy clay
6	21			Yellow clay
21	23			Yellow clay w/sand streaks
23	42			Grey clay
42	50			Med. Sand & gravel
50	62			Grey clay w/sand streaks
62	103			Grey clay
103	104			Grey shale
104	106			Brown shale
106	115			Red shale

NOTES: SIZE OF PIT

_____ X _____ X _____

NORTHWAY WELL AND PUMP COMPANY

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TEST HOLE REPORT

Name City of Bayard PAGE - 2 -

Job No. W-531 Date 12/20/2006

City Bayard State Iowa

TEST HOLE NUMBER 1-06

Driller Marv Anderson

Test Hole Location 10-feet south of the new well

TEST LOG

FROM	TO	MARSH FUNNEL VISCOSITY SECONDS	MUD PIT LOSS INCHES	Static Water Level _____ Measured _____ Hours After Completion FORMATION
115	129			Grey shale
129	140			Grey shale - thin layers of sand stone
140	172			Tan Sand stone w/hard streaks
172	173			Grey shale
173	184			Tan sand stone
184	184.5			Tan sand stone w/coal
184.5	193			Tan sand stone
193	200			Grey shale w/coal

NOTES: SIZE OF PIT

_____ X _____ X _____

63963

DNR
AUG 24 2007
GEOL. SURVEY

FOX engineering

1601 Golden Aspen Drive • Suite 103 • Ames, Iowa 50010 • 800.433.3469 • www.foxeng.com

August 20, 2007

Mr. Paul Van Dorpe, Research Geologist
Iowa Geologic Survey Bureau
109 Trowbridge Hall
Iowa City, IA 52242

RE: **Well Logs - City of Bayard, Iowa**

Mr. Van Dorpe:

I am writing in an effort to clarify information submitted to IGSB related to construction of City of Bayard Well #3.

Recently, a Well Record was submitted by Cahoy Pump Service (Cahoy) for Well #3 (Attachment A). The formation log section included on this Record corresponds to the Driller's Log dated 9-26-06 prepared by Cahoy (Attachment B). It is our understanding that the Driller's Log and the associated formation samples were submitted to IGSB by Cahoy upon completion of drilling.

A temporary well was installed in October, 2006 based on the Cahoy driller's log and formation samples. This well produced 16 gpm and was determined to be screened at the incorrect depth.

On December 20, 2006 a confirmatory test hole (Test Hole 1-06) was drilled at Well #3 (offset 10 feet to the south of Cahoy's 9-26-06 drilled hole). The confirmatory hole was drilled by Northway Well and Pump Company. The Northway Test Hole Report is included as Attachment C. It is our understanding that Test Hole Report 1-06 and the associated formation samples were submitted to IGSB by Northway Well upon completion of drilling.

The final well (City Well #3) was installed March 21, 2007 based on the Northway Test Hole Report and formation samples. This well was test pumped at 68 gpm on April 5, 2007 and was accepted by the City of Bayard.

If possible, could you include appropriate documentation to your files to clarify the association between the two (2) drilled holes, the Well Record, and the associated samples on file with the IGSB? Thank you in advance for your assistance.

Sincerely,
FOX ENGINEERING ASSOCIATES, INC.

Todd Whipple, CPG
Project Manager

cc: City of Bayard