

### Site identification

Property Owner Sioux City Water Dept. Other ID \_\_\_\_\_  
Address 1101 Triview Ave Sioux City, Iowa  
Tenant 51102  
Well Depth 88 ft Date completed 11/6/06

### Location

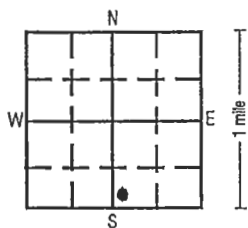
County Woodbury

0.08 mi. <sup>N</sup> and 0.5 mi. <sup>E</sup> of intersection of I-29 and Riverside Dr  
SW 1/4 of the SW 1/4 of the SE 1/4 of Sec 26 TWP 89 Rng 48 E <sup>(W)</sup>

GPS Coordinates (NAD83 datum only) decimal degrees:

42 4931 N. Latitude 96 4758 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) 1087

### Formation log

From	To	Color	Hardness	Formation description
1087	1082	Brn		silt, topsoil
1082	1070	Brn gy		Silt, Sand
1070	1058	dk gray		Silty, Sand
1058	1046	dk gray		Silty, Sand
1046	1034	dk gray		Sand - 8' Layer Clay - Sand
1034	1022	gray		Sand - fine
1022	1011	gray		Sand - Fine gravel
1011	.999	lt gray		Sand - 5' Layer Clay - Sand

use additional sheets as needed

### Remarks

(including depth of lost drilling fluids, materials, or tools)

HORIZONTAL Collector well.  
See Attached Drawing.

### Well use

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

### Drill method

☐ rotary ☐ auger ☐ cable other Cumstell

### Hole size

192 inch from 0 ft to 88 ft  
hole size continued  
\_\_\_\_\_ 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) \_\_\_\_\_ Pileless adapter (yes/no) \_\_\_\_\_

Size (ID/OD)	Type / Wt	Depth top	Depth bottom	Amount (length)
192"/234"	CONCRETE 14,640#	83	88	5'
192"/228	CONCRETE 12,350#	+6	83	89

### Perforated or slotted casing? (yes/no) - solid

Perforated / slotted from \_\_\_\_\_ ft to \_\_\_\_\_ ft  
Perforated / slotted from \_\_\_\_\_ ft to \_\_\_\_\_ ft

### Casing grouted? (yes/no)

Placement method Pumped

Type	Depth top	Depth bottom	Amount (vol/wt)
<u>SAND CEMENT WATER</u>	<u>0</u>	<u>20'</u>	<u>50cy</u>

### Well screen? (yes/no) HORIZONTAL @ 80 ft

Diameter	Slot size	Depth top	Depth bottom	Length	Material
<u>12"</u>	<u>0.020</u>	<u>82</u>		<u>1640</u>	<u>Stainless Steel</u>
	<u>0.100</u>			<u>in 7 laterals</u>	<u>wire-wrapped</u>

Bottom capped (yes/no) with CONCRETE 40cy

Seals / Packers (yes/no) kind CONCRETE depth 89-85 ft

Gravel packed (yes/no) from \_\_\_\_\_ ft to \_\_\_\_\_ ft  
type \_\_\_\_\_ amount \_\_\_\_\_

### Well developed? (yes/no)

Explain Water jet w/ sandline for each lateral  
(pumped, airlifted, bailed) for @ 5-foot intervals hrs at \_\_\_\_\_ GPM

### Pump installed? (yes/no) Not Yet

Date \_\_\_\_\_/\_\_\_\_\_/\_\_\_\_\_

Installer's name To be done by others

Type of pump \_\_\_\_\_ Depth to intake \_\_\_\_\_ ft

Pump diameter \_\_\_\_\_ Rated capacity \_\_\_\_\_ GPM

### Water information

Aquifer: ☒ sand / gravel ☐ limestone ☐ sandstone

Main water-supply zone from 40 ft to 88 ft ☐ seepage well

Static water level 15.6 ft (below/above) GL; ☒ tape ☐ airline ☐ E-line ☐ estimate

Pumping water level 43 ft below GL; ☒ tape ☐ airline ☐ E-line ☐ estimate

At yield of 8700 GPM; ☒ orifice ☐ volumetric ☐ estimate for 72 hours

Measurements taken at 10:40 (AM) (PM) Date 11/6/06

### Water quality test? (yes/no)

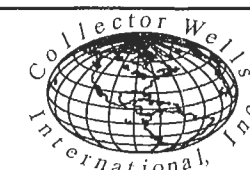
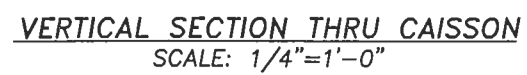
Date tested 11/6/06

Tested by \_\_\_\_\_

Contractor Collector Wells International, Inc.

Address 6360 Huntley Rd. Columbus OH 43229

Driller Michael R. Smith Certification no. 6463



6360 HUNTLEY ROAD  
COLUMBUS, OHIO 43229  
(614) 888-6263 / FAX (614) 888-9208

PLAN & SECTION VIEW  
OF COLLECTOR WELL  
RIVERSIDE COLLECTOR WELL  
SIOUX CITY, IOWA

DATE: 10/3/06

SCALE:  $1'' = 60'$



**COLLECTOR WELLS INTERNATIONAL, INC.**  
6360 HUNTLEY ROAD  
COLUMBUS, OHIO 43229  
614-888-6263

## FIELD BOREHOLE LOG

BOREHOLE NO.: TB1-06

TOTAL DEPTH: 100 feet

CLIENT: Howard R. Green / Sioux City, Iowa

JOB NO.: 106-295

SITE LOCATION: ~ 9 feet north of caisson center  
Riverside Collector Well site

DATE DRILLED: 5/10/06

GEOLOGIST: Jay Bell, CWI

COORDINATES: N 4,707,607 m E 707,426 m UTM Zone 14 NAD83

DRILLER: Dave Schrecengost, Bowser-Morner

TOP OF CASING ELEVATION: N/A

BORING DIAMETER: 6 inches

GRADE ELEVATION: 1087.07 feet

METHOD OF DRILLING: VersaSonic

NOTES: Coordinates Not Surveyed, approximately determined with handheld GPS receiver.

### Test Boring drilled for proposed Riverside Collector Well - Sioux City, Iowa.

DEPTH (feet)	LITHOLOGY	RECOVERY	WELL CONSTRUCTION	WELL DESCRIPTION
0	Brown, Silty Sand (fine sand), dry.	0 to 10 feet, 10 feet recovery		
5	Brown, fine sand, with thin lenses of silt (<2" thick).			
10	Dark brown, Silt/Clay, trace fine sand, soft.			
15	Brown, fine sand, with thin silt lenses (<1" thick), dry.	10 to 20 feet, 6 feet recovery		
20	Dark Gray, Silty Fine to Medium Sand, mostly fine.			
25	Gray, Clay, soft to medium stiff.			
30	Gray grading to gray/brown, Fine to Medium Sand, mostly medium, coarsens with depth, loose, uniform.	20 to 30 feet, 10 feet recovery		



**COLLECTOR WELLS INTERNATIONAL, INC.**  
**6360 HUNTLEY ROAD**  
**COLUMBUS, OHIO 43229**  
**614-888-6263**

## FIELD BOREHOLE LOG

BOREHOLE NO.: **TB1-06**

TOTAL DEPTH: **100 feet**

DEPTH (feet)	LITHOLOGY	RECOVERY	WELL CONSTRUCTION	WELL DESCRIPTION
35	Gray, Fine to Medium Sand, mostly medium, 20% coarse sand to fine gravel, trace to 10% clay (gray) in balls, loose.	30 to 40 feet, 9 feet recovery		
40	Gray, Fine to Medium Sand, mostly medium loose, clean			
45	Gray, Clay, soft, with 3-4" coarse sand and fine gravel, with lignite (coal) on top of clay.	40 to 50 feet, 7 feet recovery		
	Gray, Fine to Medium Sand, mostly medium loose, clean			
50		50 to 60 feet, 10 feet recovery		
55	Olive Gray, Fine to Medium Sand, mostly fine, clean, uniform.			
60	Gray/Brown, Sand and Gravel, fine to medium sand, 30-40% coarse sand to fine/medium gravel, subrounded.			
	Gray, Clay, medium stiff			
65	Gray, Silty/Clayey Sand and Gravel, fine to coarse sand, 20-40% fine to medium gravel, subangular to subrounded, 20-30% clay/silt, numerous shells (clam, < 1 cm to 3").	60 to 70 feet, 10 feet recovery		
	Gray, Silty Sand and Gravel, fine to medium sand, mostly medium, 20-30% coarse sand to medium gravel, subrounded, numerous clay pieces.			
70	Gray, Clay, medium stiff, trace fine gravel, wood fragment <2" thick at 67.5 feet, 6" thick lense of coarse sand and fine gravel below clay.	70 to 80 feet, 10 feet recovery		
75	Olive Gray, Fine to Medium Sand, mostly fine, scattered (trace) fine gravel, loose, uniform, clean.			



COLLECTOR WELLS INTERNATIONAL, INC.

6360 HUNTLEY ROAD  
COLUMBUS, OHIO 43229

614-888-6263

## FIELD BOREHOLE LOG

BOREHOLE NO.: TB1-06

TOTAL DEPTH: 100 feet

DEPTH (feet)	LITHOLOGY	RECOVERY	WELL CONSTRUCTION	WELL DESCRIPTION		
80	Gray, Fine to Medium Sand, mostly medium, 10% coarse sand, clean.	80 to 90 feet, 10 feet recovery				
85	Gray, Sand and Gravel, medium to coarse sand, mostly medium, 20-40% fine to medium gravel, subrounded, loose, 4" gray clay lenses at 86 and 89 feet, 8" gray clay lense at 88 feet.					
90	White/Gray, Sandstone (poorly cemented, friable) Very Fine to Fine Sand, dense, uniform.	90 to 100 feet, 10 feet recovery				
95						
100						