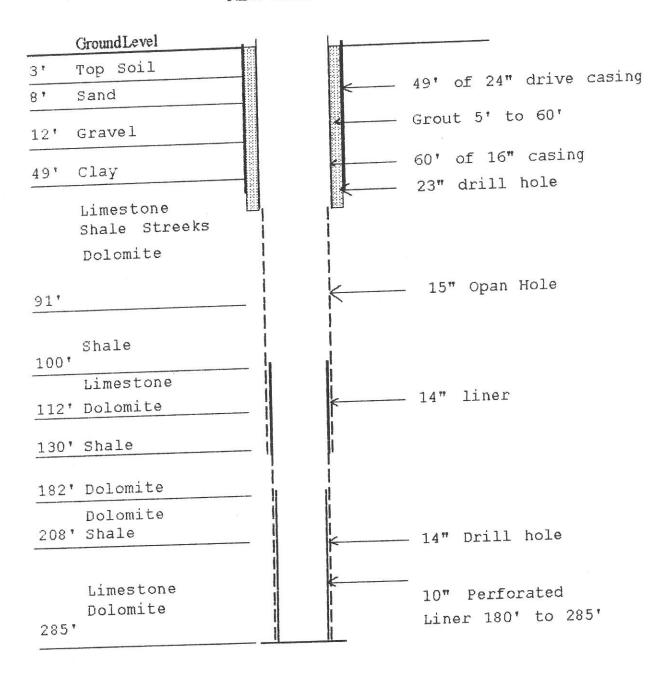
lowa Department of Natural Resources Geological Survey Bureau 109 Trowbridge Hall, Iowa City, IA 52242-1319 PH (319) 335-1575

Site identification						Drill method □ rotary □ auger ☑ cable other							
Property Owner Story City Well Number 4						e	.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		hole size o	continued			
Address NEW WELL						from _	<u>0</u> ft	to 63ft	14 in	ich fron	1130ft	to 2.8.5ft	
Tenant City of Story City, Iowa								td <u>30</u> ft					
Well Depth 285 ft Date completed 7 / 29 / 04													
Location County Story						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)		
mi. N andmi. E of intersection of and						16" OD ST/62.58			+4 63' 98' 133'			67'	
						14" OD ST/52.57 9				98' 133'		35'	
Show exact location of well in section grid with a dot (●). Sketch map of well location on property. N						5.	1/40	.40 1	. / 2 '	270		106'	
N N													
						Perforated or slotted casing? (yes ≥0∞)							
W E E						Perforated / slotted from 172 ft to 278 ft							
<u> </u>						Perforated / slotted fromft toft							
S 200 ft						Casing grouted? (yes কিউ) Placement method <u>pressu</u>						sure	
upland 🖄 hillside 🗆 valley Elevation (if known)						Type Depth Top							
	tion log	l Color	l Uardnaaa	. Formation description	neat g	rout	0	1	63	!	120	cu ft	
From	3	BL.	Hardness	Formation description Top soil									
3	8	BR.		Sand	Well scre		3 5	Donth Ton	l D15 D-11				
8	12	BR.		Gravel	Diameter	Slot s		Depth Top	Depth Bot	tom	ength	Material	
						0				_			
12	49	BLU.		Clay	Bottom canner			with				1	
49	100			Limestone	Bottom capped (yes/no) with								
100	130			Limestone w/	Gravel packed (yes/no) fromft to								
				Shell Streaks	typeamount								
130	172			Limestone	Well developed? (yes /hex)								
172	285			Limestone w/	Explain pumped								
				Shale Streaks	(pumped, xirk(tpd, bailed) for 100 hrs at 900 GPM.								
				District Delicated	Pump installed? (yes/MoX) Date 7 /29 / 04 Installer's name Don Murphy- Northway Well								
					1	Type of pump Submersible Depth to intake 247' ft							
					Pump diameter	Pump diameter 8" Rated capacity 800 GPM							
					Water info	rmatio	n	A suite		30			
					Main water-supp			Aquifer: □s					
					Static water leve								
					Pumping water I								
					At yield of 7	80 ,	GPM:	orifice 🖾 volu	metric □ •	etimata	C-IIIle	□ e2nuate	
				litional sheets as needed	At yield of $\underline{780}$ GPM; \square orifice \boxtimes volumetric \square estimate Measurements taken at $\underline{\hspace{0.5cm}}:\hspace{0.5cm} \underline{\hspace{0.5cm}}$ (AM / PM) Date $\underline{7}$ / $\underline{29}$ / $\underline{04}$								
(morading depth of lost drining fluids, filaterials, of (001s)													
Well started to flow at 75'					Water quality test? (yes/nx) Date tested 12/16/03 Tested by State Hygenic Lab								
Well use													
						ContractorNorthway Well & Pump Co.							
☐ Test well ☐ Irrigation ☐ Other					Address 100 N. 6th St. Waukee, IA Driller Frank Case Certification no. 40364								
				(explain)	DIIIIO H'T	ank	Las	e		Certificat	ion no. 4	0364	

STORY CITY 2003 NEW WELL DESIGN



to Gale MacIntosh Northway Well Co. FAX 515-987-4247 from Brian Witzke Iowa Geological Survey

I did a preliminary examination of well cuttings from the Story City Test Hole No. 1 (Story County), and I can verify that the upper bedrock strata (49-100 ft) in this test well are not represented in the nearby Story City #2 municipal well (where bedrock top occurs at 105 ft). These upper strata probably are hydrologically separated (by a shale zone approximately 105-130 ft) from the lower Mississippian aquifer utilized in the other municipal wells. In other words, the upper bedrock strata likely form a separate upper Mississippian aquifer that does not occur in the other municipal wells.

A preliminary description of the well cuttings follows:

QUATERNARY unconsolidated sediments (0-49 ft) [note that these unconsolidated sediments are much thicker 0-105 ft in well #2]

0-3 ft. soil

3-12 ft. sand and gravel.

12-49 ft. glacial till (oxidized to unoxidized)

MISSISSIPPIAN bedrock

ST. LOUIS FORMATION [note that the St. Louis Fm is absent in well #2]

49-55 ft. Limestone, dense to crystalline, part silty to sandy.

55-60 ft. Limestone and crystalline dolomite.

60-65 ft. Limestone, dense; dolomite, part silty; sandstone, very fine to fine

65-70 ft. Dolomite, light brown, calcitic, part sandy; dolomite, light gray, sl. argillaceous

70-75 ft. Dolomite and limestone; 20% siltstone to vf sandstone.

75-80 ft. Limestone, dense; dolomite, part silty to sandy; 25% chalcedony.

80-85 ft. Dolomite, medium gray, argillaceous to shaly

85-90 ft. Dolomite, light gray, sandy to very sandy; dolomite, light yellow, dense.

90-95 ft. Dolomite, argillaceous, grades to sandy/silty dolomitic siltstone.

95-100 ft. Dolomite, silty-sandy, part approaches sandstone. trace chalcedony, quartz

KEOKUK/WARSAW FORMATIONS

100-105 ft. Dolomite, very light bronw gray, very fine crystalline, part moldic (sponge spicule molds); 15% chert; 10% chalcedony.

105-110 ft. Shale, light medium gray; grades to very argillaceous to shaley dolomite.

110-115 ft. Dolomite, argillaceous; and dolomite, brown, moldic (sponge spicules); 5-10% chert.

115-120 ft. Dolomite, very argillaceous to **shaly**; dolomite, brown, moldic to siliceous (sponge spicules); 20% chert; trace of chalcedony and quartz.

120-125 ft. 100% shale, light medium gray.

- 125-130 ft. **Shale** as above; argillaceous dolomite; moldic dolomite (sponge spicules); 10\$ chert; trace of quartz and chalcedony.
- 130-135 ft. Dolomite, light brown, crystalline to moldic, part glauconitic.
- 135-140 ft. Dolomite, pale to light brown, part calcitic, part glauconitic, crystalline calcite.

BURLINGTON FORMATION

- 140-145 ft. 80% Limestone, crinoidal packstone; 20% dolomite, part argillaceous. 145-150 ft. Limestone, crinoidal as above, part glauconitic, scattered fish bone; 10%
- dolomite.
- 150-160 ft. Limestone to dolomitic limestone, crystalline to crinoidal, glauconitic through most.
- 160-263 ft. Not logged; largely identical to the interval in the other municipal wells. Includes limestone and dolomite strata (part cherty) of the Burlington Formation, Gilmore City Formation, and Maynes Creek Formation; these strata form the main part of the Mississippian aquifer in the nearby municipal wells.

BASAL MISSISSIPPIAN and UPPERMOST DEVONIAN 263-270 ft. Shale and siltstone; these form the basal aquitard.

Feel free to contact me about any questions or concerns.

Brian Witzke Geologist Iowa DNR – Iowa Geological Survey

August 4, 2003