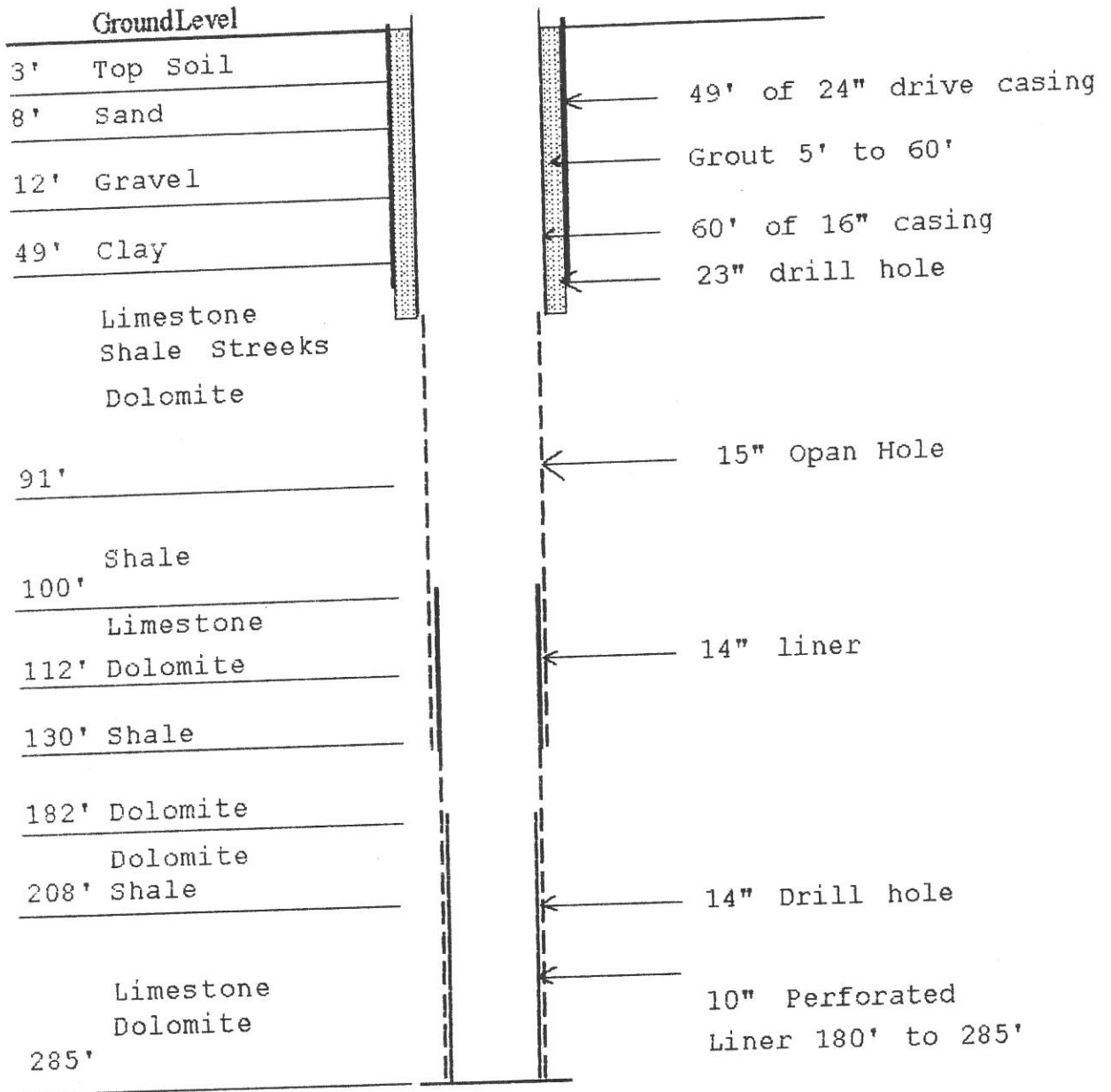


61257

yellow copy – County Health Officer

**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 brown 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 shaly 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