

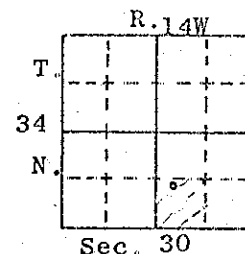
Wisconsin Geological and Natural History Survey Open-File Report 2019-01
Zambito, J.J., IV, Haas, L.D., Parsen, M.J., and McLaughlin, P.I.

Appendix C. Geologic logs and geophysics

WGNHS records for studied boreholes

Well name Village of Turtle Lake Well #2
Owner Almerna Township
Address... Village of Turtle Lake
Box 26
Turtle Lake, Wisconsin 54889
Driller... Keys Well Drilling Co.
Engineer A. W. Banister

County: Barron
Completed... March 21, 1969
Field check.
Altitude... 1270' ETM
Use... Municipal
Static w.l. 108'
Spec. cap... 10.1



Location: SW $\frac{1}{4}$, NE $\frac{1}{4}$, NE $\frac{1}{4}$, NW $\frac{1}{4}$, SW $\frac{1}{4}$, SE $\frac{1}{4}$, sec. 30, T. 34N., R. 14W. Quad. Turtle Lake 15'

| Drill Hole | | | | | | Casing & Liner Pipe or Curbing | | | | | | | |
|-----------------|------|------|------|------|----|--------------------------------|---------------------------|------|------|------|--------------------------|------|------|
| Dia. | from | to | Dia. | from | to | Dia. | Wgt. & Kind | from | to | Dia. | Wgt. & Kind | from | to |
| 20" | 0 | 230' | | | | 20" | 3/8" Wall, Blk. Steel 78# | 0 | 169' | 12" | 3/8" Wall Blk. Steel 50# | +2' | 277' |
| 12" | 230' | 748' | | | | | | | | | | | |
| Grout: Kind | | | | | | | | | | | | from | to |
| Grout - 1:1 Mix | | | | | | | | | | | | 0 | 255' |

Samples from 0 to 748' Rec'd: 6/2/69 Studied by: M. Roshardt Issued: Jan. 1970

Formations: Drift, Prairie du Chien Group, Trempealeau Group, Tunnel City Group, Wonewoc Sandstone, Eau Claire Sandstone, Mt. Simon Sandstone.

Remarks: Well tested for 36 hours at 500 gpm with 49' of drawdown.

LOG OF WELL:

| | Depths | Graphic Section | Rock Type | Color | Grain Size | | Miscellaneous Characteristics |
|---|---------|-----------------|-----------|-----------|------------|------------|---|
| | | | | | Mode | Range | |
| D | 0-5 | | Sand | Red or | M | Vfn/VC | Quartz, granite, trap. Trace gravel. |
| | 5-10 | | " | " | " | " | Quartz, granite, trap. Trace clay, silt, granules. |
| | 10-15 | | " | " | Fn | " | Same but little silt. |
| | 15-20 | | Gravel | " | M pnb | Gran/L pnb | Trap, granite, quartz. Much mixed sand. Little clay-silt. |
| | 20-25 | | " | " | S pnb | Gran/M pnb | Same |
| | 25-30 | | " | " | Gran | Gran/S pnb | Same plus sandstone. |
| | 30-35 | | Sand | " | Fn/M | Vfn/VC | Quartz, trap, granite. Much clay. Little silt. Trace granules. |
| | 35-40 | | Gravel | " | M pnb | Gran/L pnb | Mostly trap. Little mixed sand, clay, silt. |
| | 40-45 | | " | " | S pnb | " | Trap, rhyolite, granite, quartz. Trace sand, silt, clay. |
| | 45-50 | | " | " | Gran | Gran/M pnb | Same |
| R | 50-55 | | " | " | " | " | " |
| | 55-60 | | Sand | " | M | Vfn/VC | Much clay. Little silt. Trace granules. |
| | 60-65 | | " | " | " | " | Same |
| | 65-70 | | " | " | " | " | " |
| | 70-75 | | " | " | " | " | " |
| | 75-80 | | " | " | " | " | " |
| | 80-85 | | Gravel | " | M pnb | Gran/M pnb | Rhyolite, quartz, sandstone, trap. Little mixed sand, silt, clay. |
| | 85-90 | | Sand | Or brown | Fn/M | Vfn/VC | Little clay-silt. |
| | 90-95 | | " | Yl orange | Fn | Vfn/M | Much clay. Little silt. |
| | 95-100 | | " | " | " | " | Same |
| I | 100-105 | | " | " | " | " | " |
| | 105-110 | | " | " | " | " | Same plus trace granules. |
| | 110-115 | | " | " | " | " | Same |
| | 115-120 | | Clay | " | Clay | -- | Little sand, silt. |
| | 120-125 | | " | " | " | -- | Same |
| | 125-130 | | " | " | " | -- | " |
| | 130-135 | | " | " | " | -- | " |
| | 135-140 | | " | " | " | -- | " |
| | 140-145 | | " | " | " | -- | Same plus trace granules. |
| | 145-150 | | Sand | " | M | Vfn/VC | Much clay. Few mixed granules & small pebbles. Trace silt. |
| F | 150-155 | | " | " | " | " | Same plus trace very large quartz pebbles, Trace clay. |
| | 155-160 | | " | Br yl or | " | " | Little clay. Trace silt, gravel. |

Well name: Village of Turtle Lake Well #2

| | Depths | Graphic Section | Rock Type | Color | Grain Size | | Miscellaneous Characteristics |
|---|---------|-----------------|-----------|------------|------------|-----------|--|
| | | | | | Mode | Range | |
| D A Y T | 160-165 | | Sand | Yl orange | Fn/M | Vfn/VC | Little clay. Trace silt, gravel. |
| | 165-170 | | " | " | " | " | Same |
| 175' | 170-175 | | Gravel | Yl brown | Gran | Gran/M pb | Dolomite, quartz, basalt, rhyolite, sandstone. Little sand. |
| P&C | 175-180 | | Dolomite | " | Fn/M | Fn/M | Trace mottling, sand. |
| 10' | 180-185 | | " | " | " | " | Little sand. Trace mottling. |
| T R E M P E A L E A U | 185-190 | | Sandstone | " | M/C | Vfn/VC | Much limonite-calcite-silica cement. |
| | 190-195 | | " | " | M | " | Little limonite-silica-dolomite cement. |
| | 195-200 | | " | " | M/C | " | Same but trace cement. |
| | 200-205 | | " | " | " | " | Same |
| | 205-210 | | " | " | " | " | " |
| | 210-215 | | " | " | " | " | Trace clay, silt, limonite-silica cement, dolomite. |
| | 215-220 | | " | " | " | " | Same |
| | 220-225 | | " | Br yl or | M/C | M/VC | -- |
| | 225-230 | | " | Yl orange | " | " | -- |
| | 230-235 | | " | " | " | Fn/VC | Trace limonite cement. |
| | 235-240 | | " | " | C | " | -- |
| | 240-245 | | " | " | " | M/VC | -- |
| | 245-250 | | " | " | M | Fn/VC | Trace silica-limonite cement. |
| | 250-255 | | " | " | " | Vfn/C | Trace silica cement. |
| | 255-260 | | " | " | Fn&C | Fn/C | Trace limonite cement. |
| 80' | 260-265 | | " | " | M | Fn/VC | -- |
| T U N N E L | 265-270 | | " | " | C | Vfn/C | Much gn glauconitic dolc shale. Little limonite-silica ce. |
| | 270-275 | | " | Green yl | Fn | Vfn/VC | Much green & Yellow glauconitic dolc sh. glauc. Tr lim cement. |
| | 275-280 | | " | " | C | Vfn/C | Ltl glauc, calcite-dol cem, green-white glauconitic dolc shales. |
| | 280-285 | | " | " | Fn&C | Vfn/VC | Much dolomite cement. Little glauconite. |
| | 285-290 | | " | Gry or pnk | M | Vfn/C | Little dolomite-limonite cement. Trace glauconite. |
| | 290-295 | | " | " | " | " | Same |
| | 295-300 | | " | Lt gray | Fn/M | " | Trace silica cement. |
| | 300-305 | | " | " | Fn | " | Same |
| | 305-310 | | " | " | " | " | " |
| | 310-315 | | " | " | Fn/M | " | Same plus trace glauconite. |
| | 315-320 | | " | " | Fn | Vfn/VC | Same |
| | 320-325 | | " | " | " | Vfn/C | Little silica-dolomitic matrix. Trace glauconite, green shale. |
| | 325-330 | | " | " | " | " | Same but no shale. |
| | 330-335 | | " | " | " | " | Same |
| | 335-340 | | " | " | " | " | " |
| C I T Y | 340-345 | | " | " | " | " | " |
| | 345-350 | | " | " | " | " | " |
| | 350-355 | | " | " | " | " | Same plus trace green clay matrix. |
| | 355-360 | | " | Gn yl gry | " | " | Much lt&dk gn dolc matrix. Ltl lim-silica-dol cem. Tr glauc. |
| | 360-365 | | " | Yl gray | " | " | Much lim cem. Tr dol-silica cem, green matrix, glauconite. |
| | 365-370 | | " | " | " | " | Little clay matrix. Trace limonite cement. |
| | 370-375 | | " | Yl or | " | " | Trace limonite cement. |
| | 375-380 | | " | Yl gray | " | " | Same plus trace clay matrix. |
| | 380-385 | | " | " | Vfn | " | Little silt, matrix. Trace limonite cement, glauconite. |
| | 385-390 | | " | " | Fn | " | Trace limonite cement. |
| | 390-395 | | " | " | " | " | Little limonite-silica cem, dolomitic clay matrix. |
| | 395-400 | | " | " | " | " | Same plus little silt. Trace glauconite. |
| | 400-405 | | " | " | Fn&C | Vfn/VC | Much limonite cement. Little silica cem, matrix, st. Tr glauc. |
| | 405-410 | | " | " | Vfn | " | Much very slightly dolc matrix. Tr lim-silica cem, glauc, st. |
| | 410-415 | | " | " | " | " | Same plus little green gray sandy shales. |
| 185' W O N E W O C | 415-420 | | " | " | " | Vfn/C | Much slightly dolc matrix. Ltl silt. Tr lim-silica cem, glauc. |
| | 420-425 | | " | " | " | " | Same |
| | 425-430 | | " | " | " | " | " |
| | 430-435 | | " | " | " | " | " |
| | 435-440 | | " | Yl green | Fn | " | Much matrix, glauconite. Little silt. Tr silica-dolomite cem. |
| | 440-445 | | " | " | " | Vfn/M | Same |
| | 445-450 | | " | " | " | Vfn/C | Little glauc, matrix. Trace limonite-silica cement, silt. |
| | 450-455 | | " | Gn yl gry | C | Vfn/VC | Tr glauconite, limonite-dolomite-silica cement, matrix. |
| | 455-460 | | " | " | " | " | Same |
| | 460-465 | | " | " | " | " | Little matrix. Trace limonite-pyrite-dolomite cem, silt, glauc. |
| | 465-470 | | " | " | " | " | Same |
| | 470-475 | | " | Gry or pnk | M | " | Little matrix. Trace glauconite, silt. |
| | 475-480 | | " | " | " | " | " |
| | 480-485 | | " | Yl gray | VC | " | Little green, yellow, white matrix. Tr gn shale, limonite cem. |
| | 485-490 | | " | " | C | " | Much matrix, green shale. |

Well name: Village of Turtle Lake Well #2

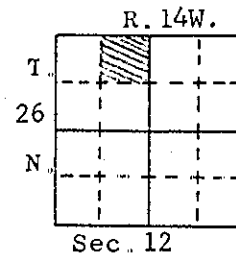
| | Depths | Graphic Section | Rock Type | Color | Grain Size | | Miscellaneous Characteristics |
|--|---------|-----------------|-----------|-------------|------------|--------|--|
| | | | | | Mode | Range | |
| W O N E W O C | 490-495 | | Sandstone | Gry or pink | VC | Vfn/VC | Little matrix, trace green shale, limonite cem, few grains. |
| | 495-500 | | " | " | " | " | Same |
| | 500-505 | | " | " | " | " | Little matrix, few granules. |
| | 505-510 | | " | " | C | " | Little matrix. |
| | 510-515 | | " | " | " | " | Same plus trace glauconite. |
| | 515-520 | | " | " | " | " | Little matrix, trace limonite cement, glauconite, granules. |
| | 520-525 | | " | " | " | " | Trace matrix, limonite cement, granules. |
| | 525-530 | | " | " | " | " | Little matrix, limonite cement, trace glauconite. |
| | 530-535 | | " | " | " | " | Much matrix, trace limonite cement. |
| | 535-540 | | " | " | " | " | Little matrix, trace limonite cement. |
| 100' E A U C L. | 540-545 | | " | " | " | " | Trace matrix, limonite cement. |
| | 545-550 | | " | " | " | " | Little matrix, silica cement, tr foss frags, lim cem, sh, etc. |
| | 550-555 | | Shale | Gray | Clay | -- | Much Vfn-fn sand, little mica, silt, silica cement. |
| | 555-560 | | " | " | " | -- | Little sand, mica, trace pyrite. |
| | 560-565 | | " | " | " | -- | Same |
| | 565-570 | | " | " | " | -- | Same plus trace silica cemented slightly glauco sandstone. |
| | 570-575 | | Sandstone | " | Fn | Vfn/VC | Much clay matrix, ltl silica-lim-pyr cem, tr foss frags. |
| | 575-580 | | " | " | Fn/M | Vfn/C | Same but trace cement. |
| | 580-585 | | " | " | Fn | Vfn/M | Same |
| | 585-590 | | " | " | M | Vfn/C | Much clay matrix, ltl br shale, tr foss frags, lim-silica-pyr |
| 55' M T S I M O N | 590-595 | | " | " | " | " | Same plus little green sandy micaceous shale. /cement. |
| | 595-600 | | " | " | " | " | Much clay matrix, tr cem, br shale, fossil fragments. |
| | 600-605 | | " | " | " | " | Same |
| | 605-610 | | " | " | " | " | " |
| | 610-615 | | " | " | M/C | Vfn/VC | Ltl matrix, tr lim-silica-pyr cement, brown shale. |
| | 615-620 | | " | " | C | " | Same |
| | 620-625 | | " | Or gray | " | " | Same but much matrix. Plus trace green micaceous shale. |
| | 625-630 | | " | " | " | " | Little matrix, cement, green shale, trace fossil fragments. |
| | 630-635 | | Shale | Yl or gry | Clay | -- | Much Vfn-VC sand. |
| | 635-640 | | Sandstone | " | Vfn | Vfn/VC | Much clay matrix. |
| 143' | 640-645 | | Shale | Yl or gry | Clay | -- | Much Vfn-VC sand. |
| | 645-650 | | Sandstone | Or gry | Vfn | Vfn/VC | Much clay matrix, tr lim-silica cem, tr pyr, foss fragments. |
| | 650-655 | | " | " | " | " | Same plus trace granules. |
| | 655-660 | | " | " | " | " | Same |
| | 660-665 | | " | " | Fn | " | " |
| | 665-670 | | " | " | " | " | Much clay matrix, trace limonite-silica cement, fossil frags. |
| | 670-675 | | " | " | M | " | Same plus trace granules. |
| | 675-680 | | " | Yl or gry | Fn/M | " | Same |
| | 680-685 | | " | " | " | " | Same plus trace pyrite cement, green shale. |
| | 685-690 | | " | " | " | " | Much clay matrix, trace limonite cement, green shale, frags. |
| | 690-695 | | " | " | " | " | Same |
| | 695-700 | | " | " | " | " | Same but no green shale. |
| | 700-705 | | " | " | " | " | Same but little green shale. |
| | 705-710 | | " | " | " | " | Much clay matrix, trace limonite, granules. |
| | 710-715 | | " | " | " | " | Same but no granules. |
| | 715-720 | | " | " | M | " | Same |
| | 720-725 | | " | " | " | " | Same plus trace granules. |
| | 725-730 | | " | " | Fn&C | " | Same |
| | 730-735 | | " | " | " | " | " |
| | 735-740 | | " | " | C | " | Same plus trace green shale. |
| | 740-745 | | " | " | Fn&C | " | Same |
| | 745-748 | | " | " | " | " | Same plus trace pyrite. |

END OF LOG

Well name Duane Welch Well
Eau Galle Township
Owner..... Duane Welch
Address.. Route 2
Elmwood, WI 54740
Driller... Aamot Well Co., Inc.
Engineer.

County: Dunn

Completed....
Field check..
Altitude..... 850' ETM
Use..... Irrigation
Static w.l... 58'
Spec. cap... 8.25 GPM/ft.



Quad. Weston 7 $\frac{1}{2}$ '

Drill Hole

Casing & Liner Pipe or Curbing

| Dia. | from | to | Dia. | from | to | Dia. | Wgt. & Kind | from | to | Dia. | Wgt. & Kind | from | to |
|------|------|------|------|------|----|------|------------------------|------|-----|------|-------------|------|----|
| 12" | 0 | 343' | | | | 12" | black welded 48 lb. | 0 | 25' | | | | |

Drilling method: Cable Tool
Samples from 0 to 345' Rec'd: 8/13/77

Grout from to

Studied by: Kathleen Massie

Issued: 9/29/82

Formations: Alluvium, Tunnel City Formation, Wonewoc Formation, Eau Claire Formation,
Mt. Simon Sandstone.

Remarks: Well tested for 6 hours at 495 GPM with 60 feet of drawdown.
Driller reports total well depth of 343'.
DNR Permanent Well #08138 and Dunn Co. Irrigation #28.

LOG OF WELL:

| | Depths | Graphic Section | Rock Type | Color | Grain Size | | Miscellaneous Characteristics |
|-------------|---------|-----------------|------------|------------|------------|----------|--|
| | | | | | Mode | Range | |
| All. | 0-5 | | Sand | Dk yl bn | Fn | Vfn/VC | Much gravel, soil. Trace glauconite. |
| | 5-10 | | Gravel | " | L. peb | Gran/VLP | Glauconitic silica-cemented sandstone. Trace clay. |
| | 10-15 | | " | " | " | Gran/Cob | Same. |
| 20' | 15-20 | | Snd & clay | Ol brown | Fn/M | Vfn/VC | Dolomitic (clay & residual cem). V wea ss. Mch Fn/M glauconite. |
| | 20-25 | | Sandstone | Olive | M | " | Srnd. Mch P dol cem, Fn/M glauc. Trace clay. Weathered. |
| | 25-30 | | " | " | Fn/M | " | Same. |
| TUNNEL CITY | 30-35 | | " | Lt ol bn | M | " | Srnd. Ltl poor calcus cement. Much M glauconite. |
| | 35-40 | | " | Grey ol gn | " | " | Same plus much green clay. |
| | 40-45 | | " | Olive | Fn | " | Srnd. Ltl poor calcus cement. Much Fn-glauconite, green clay. |
| 30' | 45-50 | | Shale | " | — | — | Dolomitic. Much rnd M/C sandstone, silt/M-glauconite. |
| | 50-55 | | Sandstone | Pl yellow | M | Vfn/VC | Subrounded. Trace dolomite cement. Little M-glauconite. |
| | 55-60 | | " | " | C | " | Rounded. Trace M-glauconite. |
| W | 60-65 | | " | Lt grey | " | " | Same. |
| | 65-70 | | " | Bn yellow | " | " | Rounded. Trace silica & limonite cem, Fn glauconite, qtz grains. |
| | 70-75 | | " | Yellow | Fn&C | " | Rounded. Trace pyr incl, yl or staining, quartz granules. |
| O | 75-80 | | " | " | C | " | Same plus trace limonite cement. |
| | 80-85 | | " | " | " | " | Rounded. Trace yellow staining. |
| | 85-90 | | " | " | " | " | Subrounded. Much silt. Trace Fn glauconite. |
| C | 90-95 | | " | " | M/C | " | Same. |
| | 95-100 | | " | Bn yellow | " | " | " |
| | 100-105 | | " | " | Fn&C | " | " |
| 85' | 105-110 | | " | Yellow | " | " | " |
| | 110-115 | | " | Lt bn gry | " | " | Srnd & rnd. Tr pyr & sil cem, yl stng. Few pyr incl, fos frags. |
| | 115-120 | | " | " | " | " | Same. |
| E.C. | 120-125 | | " | " | " | " | " |
| | 125-130 | | " | Gry brown | " | " | Srnd & rnd. Ltl dol cem. Tr pyr & sil cem, mica, pl gn micaceous |
| | 130-135 | | " | " | " | " | Same plus trace Fn-glauconite, sh, pyr incl, yl stng. Mny fos frags. |
| 135-140 | 135-140 | | " | Grey | Vfn | " | Srnd. Tr dol & pyr cem, Fn-glauconite. Mch pl gn micaceous sh. Mny |
| | 140-145 | | Ss & shale | " | " | " | See end of log. fossil fragments. |
| | 145-150 | | Sandstone | Ol grey | " | " | Sang. Mch slgtly dolicecem, Fn-glauconite, fos frags. Ltl pl gry sh, mica. |
| 150-155 | 150-155 | | " | " | " | " | Same but little slightly dolomitic cement. |
| | 155-160 | | " | " | " | " | Same. |
| | 160-165 | | " | " | " | " | |

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WGNHS Well ID 62000166

DATE 8/4/15 WELL NAME WGNHS Arcadia Quarry

LOCATION The Kramer Company Quarry SE of Acadia



Wisconsin Geological & Natural History Survey

COUNTY Trempealeau

LOGGED BY Bill Batten

LATITUDE 44.202276

LONGITUDE -91.459189

LOCATION METHOD: GPS AIR PHOTO/TOPO PLSS OTHER DEM

ELEVATION 1200 ELEVATION METHOD: DEM TOPO OTHER

WELL DEPTH 445 CASING DEPTH 23.6 DEPTH TO WATER 145

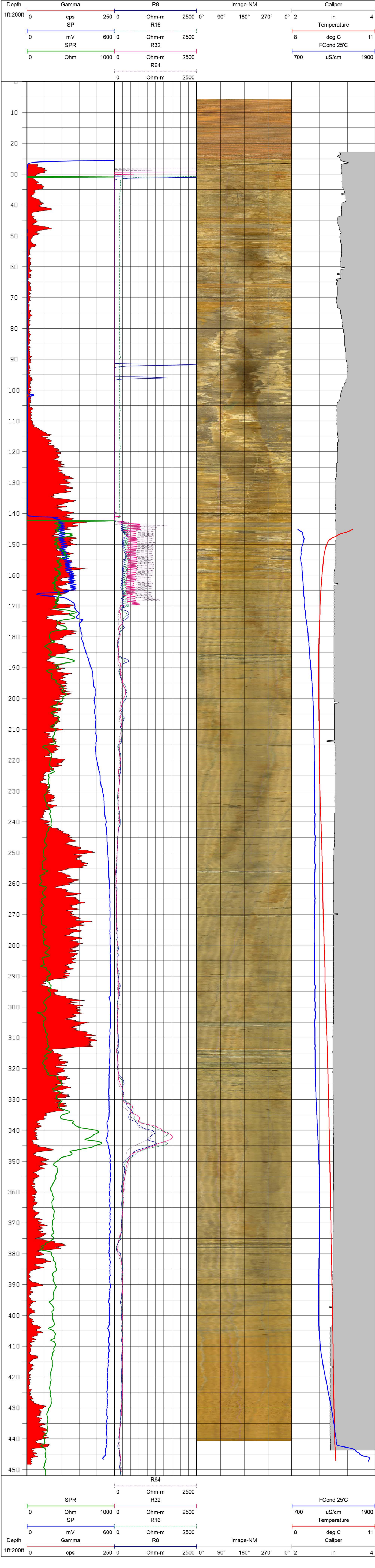
CASING STICK UP 1.2 File Created on: 1/27/2016 by: AMB

Comments:

LOGS COLLECTED:

- Gamma X Fluid Conductivity X
- Caliper X Flow Meter- HeatPulse
- Single Point Resistivity X Flow Meter- Spinner
- Self Potential X Optical Borehole Imager X
- Normal Resistivity X Acoustic Borehole Imager
- Fluid Temperature X OTHER:

Unless Noted:
- all depths are in feet
- well depth, casing depth and depth to water are interpreted from geophysical log
- datum is the top of casing



Well name Arbor Hills Addition Well
Shelby Township
Owner.... Town of Shelby Sanitary Dst. #2
Address... 1130 Cedar Road
LaCrosse, Wisconsin 54601
Driller... Ace Well Drilling
Engineer... Davy Engineering Co.
LaCrosse, Wisconsin

County: LaCrosse

Completed... 6/18/70
Field check. W.G.S.-R.M.P.
Altitude.... 1135.5'
Use..... Subdivision
Static w.l... 485'
Spec. cap... 4.0

R. 7W
T. 15
N.
Sec. 3

Quad. LaCrosse 7 $\frac{1}{2}$ '

| Drill Hole | | | | | | Casing & Liner Pipe or Curbings | | | | | | | |
|--------------------|------|------|------|------|------|---------------------------------|---|------|-----|------|--|------|--------|
| Dia. | from | to | Dia. | from | to | Dia. | Wgt. & Kind | from | to | Dia. | Wgt. & Kind | from | to |
| 17 $\frac{1}{4}$ " | 0' | 125' | 10" | 600' | 802' | 18" | O.D.P.E.- New Black Steel 8lbs. per ft. 70.59 | 0' | 17' | 10" | I.D.P.E. New Black Steel 40 $\frac{3}{8}$ lbs. per ft. | +10' | 610.6' |
| 12 | 125' | 600' | | | | | | | | | | | |
| Grout: Kind | | | | | | | | | | | | from | to |
| Cement and water | | | | | | | | | | | | 0' | 600' |

Samples from 0' to 800' Rec'd: 6/4/70 Studied by: M. Roshardt Issued: Mar. 1971

Formations: Alluvium, Prairie du Chien Group, Jordan Sandstone, St. Lawrence Dolomite, Tunnel City Group, Wonewoc Sandstone, Eau Claire Sandstone, Mt. Simon Sandstone

Remarks: Well tested for 24 hours at 214 gpm with 52 feet of drawdown.

Driller reports well depth of 802'.

W.G.S. Resistivity, Gamma & Self-Potential Logs - 10/14/70.

Altitude Shown includes 10' of fill not shown on graphic log.

LOG OF WELL:

| | Depths | Graphic Section | Rock Type | Color | Grain Size | | Miscellaneous Characteristics |
|-----|---------|-----------------|-----------|------------|------------|------------|---|
| | | | | | Mode | Range | |
| All | 0-5 | | Gravel | Orange bn | Gran | Gran/S peb | Much clay-silt. Little sand. |
| 10' | 5-10 | | " | " | " | " | Same |
| P. | 10-15 | | Dolomite | Tan | M | Fn/M | Little gray chert. Trace floating quartz, sand. |
| du | 15-20 | | " | " | " | " | Little floating quartz. Trace chert, sand. |
| C. | 20-25 | | " | " | " | " | Little oolitic chert, floating quartz. Trace sand. |
| 25' | 25-30 | | " | " | " | " | Oolitic. Little floating quartz, sand. Tr gray chert. |
| | 30-35 | | " | " | " | " | Same |
| J | 35-40 | | Sandstone | " | M & C | Vfn/C | Little dolomite cement. "caved" dolomite-chert. |
| O | 40-45 | | " | " | M | " | Little dolomite cement. Trace green shale. |
| R | 45-50 | | " | " | C | Vfn/VC | Little dolomite cement. |
| D | 50-55 | | " | " | " | " | Same plus trace green shale. |
| A | 55-60 | | " | " | " | " | Little calcite cement. Trace limonite. |
| N | 60-65 | | " | " | " | " | Little calcite cement. |
| | 65-70 | | " | " | " | " | Same |
| | 70-75 | | " | " | M & C | Vfn/C | Trace calcite cement. |
| | 75-80 | | " | " | " | " | Little calcite cement. Trace green shale. |
| | 80-85 | | " | " | M | " | Little calcite-limonite cement. |
| | 85-90 | | " | " | C | Vfn/VC | Little calcite cement. |
| | 90-95 | | " | " | " | " | Trace calcite cement. |
| | 95-100 | | " | " | M & C | " | Same |
| | 100-105 | | " | " | C | " | Little calcite cement. Trace green shale. |
| | 105-110 | | " | " | " | Vfn/C | Little calcite cement. |
| | 110-115 | | " | " | " | Vfn/VC | Same |
| | 115-120 | | " | " | " | " | " |
| | 120-125 | | " | " | M | Vfn/C | Trace calcite cement. |
| | 125-130 | | " | " | M & C | Vfn/VC | Little calcite cement. Trace green shale. |
| | 130-135 | | " | " | " | " | Trace calcite cement. |
| 105 | 135-140 | | " | " | " | " | Same |
| St. | 140-145 | | Siltstone | Orange tan | -- | -- | Much dolomite cement. |
| L | 145-150 | | " | " | -- | -- | Same |
| A | 150-155 | | " | Or tan&gry | -- | -- | Much dolomite cement. Little sandy dolomite, sand. |
| W | 155-160 | | " | " | -- | -- | Same but much sandy dolomite. |

Well name: Arbor Hills Addition Well

| | Depths | Graphic Section | Rock Type | Color | Grain Size | | Miscellaneous Characteristics |
|---------------------------------|---------|-----------------|-----------|------------|------------|--------|---|
| | | | | | Mode | Range | |
| St. L A W. | 160-165 | G G | Dolomite | Gr tan&gry | Fn &M | Fn/M | Much sand. Little fn/M glauconite. Tr pyr. foss frags. |
| | 165-170 | G | " | " | " | " | Much sand. Little siltstone. Tr glauc. pyr. foss frags. |
| | 170-175 | G | " | " | " | " | Same |
| | 175-180 | G | " | " | " | " | Same but no glauconite. |
| | 180-185 | G | Siltstone | " | -- | -- | Much dolomite cement. Little glauconitic dolomite. |
| 55' | 185-190 | G | " | " | -- | -- | Same |
| | 190-195 | G G | Dolomite | " | Fn &M | Fn/M | Little sand, glauconite, siltstone. |
| | 195-200 | G G G | " | Green | " | " | Much fn/C glauconite, floating qtz. Trace pyrite. |
| | 200-205 | G G G | " | " | " | " | Same |
| | 205-210 | G G G | " | Yellow gn | " | " | " |
| T U N N E L | 210-215 | G G G | Sandstone | " | Fn | Vfn/M | Much shaly matrix, fn/C glauc. Ltl dol cem. Trace pyrite. |
| | 215-220 | G G G | " | " | " | " | Same |
| | 220-225 | G G G | " | " | " | " | " |
| | 225-230 | G G G | " | " | " | " | " |
| | 230-235 | G G G | " | " | " | " | Same but trace dolomite cement. |
| C I T Y | 235-240 | G G G | " | " | " | " | Same |
| | 240-245 | G G G | " | " | " | " | Same but little dolomite cement. |
| | 245-250 | G G G | " | " | " | " | Same |
| | 250-255 | G G G | " | " | " | " | " |
| | 255-260 | G G G | " | Green | " | " | " |
| G R O U P | 260-265 | G G G | " | " | " | " | " |
| | 265-270 | G G G | " | " | " | " | Same but much dolomite cement. |
| | 270-275 | G G G | " | Green gry | " | " | Same but trace dolomite cement. |
| | 275-280 | G G G | " | Green | " | " | Same |
| | 280-285 | G G G | Shale | Pnk gn gry | -- | -- | Much glauconite. Little sand. |
| | 285-290 | G G G | " | " | -- | -- | Same |
| | 290-295 | G G G | " | " | -- | -- | Much glauconite, sand. Little dolomite cement. |
| | 295-300 | G G G | " | " | -- | -- | Same but trace dolomite cement. |
| | 300-305 | G G G | " | Green | -- | -- | Much glauconite. Little sand. |
| | 305-310 | G G G | " | " | -- | -- | Same plus trace dolomite cement. |
| 180' | 310-315 | G G G | " | " | -- | -- | Same but much sand. |
| | 315-320 | G G | Sandstone | Gray | Fn | Vfn/M | Much shaly matrix. Ltl glauconite, dolomite cement. |
| | 320-325 | G G | " | " | " | " | Same |
| | 325-330 | G G G | " | Yellow gn | " | " | Much glauconite, shaly matrix. Little dolomite cement. |
| | 330-335 | G G G | Dolomite | Green gry | Fn &M | Fn/M | Sandy. Much glauconite. Trace pyrite. |
| W O N E W O C S A N D S T O N E | 335-340 | G G G | Sandstone | Pl gn gry | Fn | Vfn/M | Much shaly matrix, glauconite. Ltl dol cem. Tr pyrite. |
| | 340-345 | G G G | " | " | " | " | Same |
| | 345-350 | G G G | " | " | " | " | " |
| | 350-355 | G G | " | Pl gn gry | Fn &M | " | Little glauconite. Trace pyrite. |
| | 355-360 | G G | " | " | M | Vfn/C | Little glauconite. Trace pyrite, sooty pyrite. |
| | 360-365 | G G | " | " | " | " | Same plus trace fossil fragments. |
| | 365-370 | G G | " | " | " | " | Same |
| | 370-375 | G G | " | " | " | " | " |
| | 375-380 | G G | " | Gray | C | Vfn/VC | -- |
| | 380-385 | G G | " | " | C &VC | Fn/VC | -- |
| | 385-390 | G G | " | " | C | " | -- |
| | 390-395 | G G | " | " | " | " | -- |
| | 395-400 | G G | " | " | " | " | -- |
| | 400-405 | G G | " | " | " | " | -- |
| | 405-410 | G G | " | " | " | " | -- |
| | 410-415 | G G | " | " | " | " | -- |
| | 415-420 | G G | " | " | C &VC | " | -- |
| | 420-425 | G G | " | Yellow gry | C | " | Little "caved?" glauconite. |
| | 425-430 | G G | " | " | " | " | Same |
| | 430-435 | G G | " | " | " | " | " |
| | 435-440 | G G | " | " | " | " | -- |
| | 440-445 | G G | " | " | " | " | -- |
| | 445-450 | G G | " | " | " | " | Little "caved?" glauconite. |
| | 450-455 | G G | " | " | " | " | Same |
| | 455-460 | G G | " | " | M & C | " | " |
| | 460-465 | G G | " | " | " | " | " |
| | 465-470 | G G | " | " | " | Fn/C | -- |
| | 470-475 | G G | " | " | " | " | Trace pyrite. |
| | 475-480 | G G | " | " | " | " | Same |
| | 480-485 | G G | " | " | M | " | -- |
| | 485-490 | G G | " | " | " | " | -- |

Well name: Arbor Hills Addition Well

| | Depths | Graphic Section | Rock Type | Color | Grain Size | | Miscellaneous Characteristics |
|--|---------|-----------------|-----------|-------------|------------|--------|---|
| | | | | | Mode | Range | |
| W O N | 490-495 | | Sandstone | Yl gray | M & C | Fn/C | -- |
| | 495-500 | | " | " | " | " | Trace sooty pyrite. |
| | 500-505 | | " | " | M | " | -- |
| | 505-510 | | " | " | " | " | -- |
| | 510-515 | | " | " | C | Fn/VC | Trace pyrite, fossil fragments. |
| E A U C L A I R E S S | 515-520 | | " | Gray | Fn | Vfn/M | Little Vfn/M glauc. Tr pyr. foss frags, dolomite cement. |
| | 520-525 | | " | " | " | " | Much glauconite, dolomite cem. Ltl gry sh. Tr foss frags. |
| | 525-530 | | " | " | " | " | Same but few fossil fragments. |
| | 530-535 | | " | " | " | " | Same |
| | 535-540 | | " | " | " | " | " |
| | 540-545 | | " | " | " | " | " |
| | 545-550 | | " | " | " | " | " |
| | 550-555 | | " | " | " | " | Same but little glauconite. |
| | 555-560 | | " | " | " | Vfn/VC | Same but trace shale. |
| | 560-565 | | " | " | " | Vfn/C | Same but little gray shale. |
| | 565-570 | | " | " | " | Vfn/M | Little dolomite cem, gray shale, glauc, fossil fragments. |
| | 570-575 | | " | " | " | Vfn/C | Same but trace glauconite. |
| | 575-580 | | " | " | " | Vfn/M | Same plus trace pyrite. |
| | 580-585 | | " | " | " | " | Same |
| | 585-590 | | " | " | " | " | " |
| | 590-595 | | " | " | " | " | " |
| | 595-600 | | " | " | " | " | Same but much dolomite cement. |
| | 600-605 | | " | " | " | Vfn/C | Same |
| | 605-610 | | " | " | C | Vfn/VC | Ltl dol cem, foss frags. Trace pyrite, gray shale. |
| | 610-615 | | " | " | " | " | Same |
| M T S I M O N S A N D S T O N E | 615-620 | | " | " | " | Fn/VC | Trace sooty pyrite. |
| | 620-625 | | " | " | " | " | Same |
| | 625-630 | | " | " | " | " | " |
| | 630-635 | | " | " | " | " | " |
| | 635-640 | | " | " | " | " | Trace sooty pyrite, dolomite cement. |
| | 640-645 | | " | " | C & VC | " | Trace sooty pyrite. |
| | 645-650 | | " | " | C | " | Same |
| | 650-655 | | " | " | " | " | " |
| | 655-660 | | " | " | " | " | " |
| | 660-665 | | " | " | " | " | " |
| | 665-670 | | " | " | " | " | " |
| | 670-675 | | " | " | " | " | " |
| | 675-680 | | " | " | " | " | " |
| | 680-685 | | " | " | " | " | " |
| | 685-690 | | " | " | " | " | " |
| | 690-695 | | " | " | " | " | " |
| | 695-700 | | " | " | " | " | " |
| | 700-705 | | " | " | " | " | " |
| | 705-710 | | " | " | " | " | " |
| | 710-715 | | " | " | " | " | " |
| | 715-720 | | " | " | " | " | " |
| 185 | 720-725 | | " | " | " | " | " |
| | 725-730 | | " | Gry or pink | VC | " | -- |
| | 730-735 | | " | " | M & VC | " | Trace gray green shale. |
| | 735-740 | | " | " | C & VC | " | -- |
| | 740-745 | | " | " | C | " | -- |
| | 745-750 | | " | " | M & C | " | -- |
| | 750-755 | | " | " | C | " | Trace pyrite cement. |
| | 755-760 | | " | " | M & C | Vfn/VC | Trace green shale. |
| | 760-765 | | " | " | Fn & C | " | Trace pyrite cement. |
| | 765-770 | | " | " | " | " | -- |
| | 770-775 | | " | " | M | " | Trace pyrite cement. |
| | 775-780 | | " | " | Fn & C | " | -- |
| | 780-785 | | " | " | Fn & VC | " | -- |
| | 785-790 | | " | " | Fn & C | " | Trace green shale. |
| | 790-795 | | " | " | Fn & M | Vfn/C | Trace limonite. |
| | 795-800 | | " | " | Fn & C | Vfn/VC | -- |
| | | | | END OF LOG | | | |

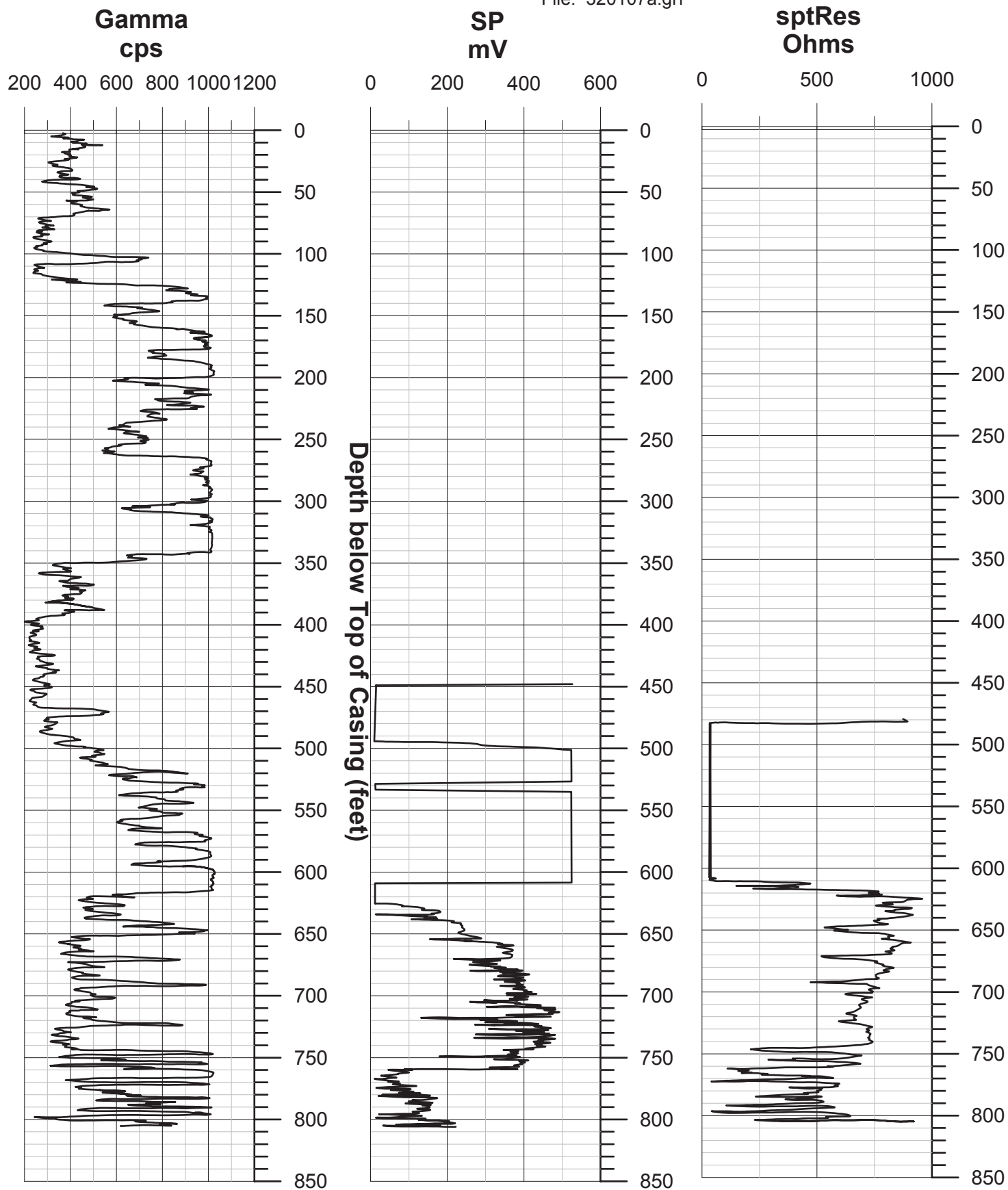
Total Depth: 802 ft
Casing: 608 ft
Depth to Water: 483 ft
Elevation: 1135.5 ft

Well: LC-107 Arbor Hills Subdivision Well

T15N, R7W, section 3, NE1/4

File: 320107a.grf

Wisconsin Geological &
Natural History Survey



WGNHS Well ID 63000165

DATE 8/19/13

WELL NAME Viroqua Municipal 6

LOCATION S. Washington Ave. Viroqua

COUNTY Vernon

LOGGED BY PMC

LATITUDE

LONGITUDE

LOCATION METHOD: GPS [X] AIR PHOTO/TOPO [] PLSS [] OTHER []

ELEVATION 1275.6 ELEVATION METHOD: DEM [] TOPO [] OTHER 5ft LIDAR DEM []

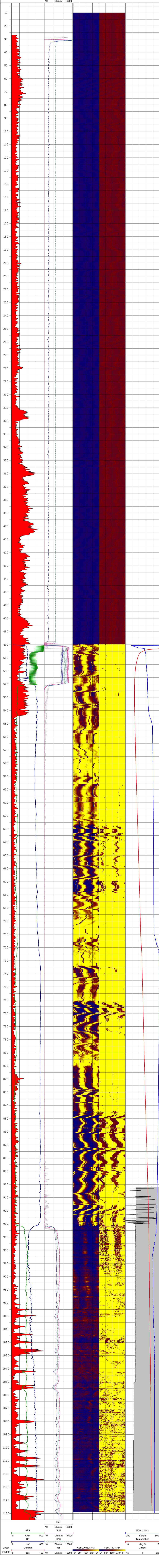
WELL DEPTH 1152.5 CASING DEPTH 935 DEPTH TO WATER 492.6

CASING STICK UP 1.4 File Created on: 9/3/2013 by: AMB

Comments: Recalibrated caliper for very long arms. ABI 0.5 ft sample interval for truiness, highest tilt 1.2 degrees.

LOGS COLLECTED:

| | | | | |
|--------------------------|-------------------------------------|--------------------------|-------------------------------------|--|
| Gamma | <input checked="" type="checkbox"/> | Fluid Conductivity | <input checked="" type="checkbox"/> | Unless Noted: |
| Caliper | <input checked="" type="checkbox"/> | Flow Meter- HeatPulse | <input type="checkbox"/> | - all depths are in feet |
| Single Point Resistivity | <input checked="" type="checkbox"/> | Flow Meter- Spinner | <input type="checkbox"/> | - well depth, casing depth and depth to water are interpreted from geophysical log |
| Self Potential | <input checked="" type="checkbox"/> | Optical Borehole Imager | <input type="checkbox"/> | - datum is the top of casing |
| Normal Resistivity | <input checked="" type="checkbox"/> | Acoustic Borehole Imager | <input checked="" type="checkbox"/> | |
| Fluid Temperature | <input checked="" type="checkbox"/> | OTHER: | <input type="checkbox"/> | |



AHERNS BROS. FARM ARTESIAN WELL

NEAR PRAIRIE DUCHIEN, WIS. $\frac{1}{2}$ of West side of Farm Lot 20.

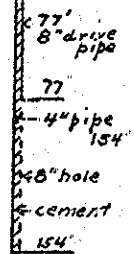
C.W. Verner, Contractor

L. Casserly, Driller, 1925

Samples examined by F.T. Thwaites, Nos 75424-75483

Elevation about 640' *etm*

| | | | | | | |
|------------|---------|---------|-----|----|---|--|
| TREMPEAU | SURFACE | 0-77 | | | sand, no samples | |
| | | 77 | | 77 | | |
| | | 77-130 | | | Dolomite with some sandstone, no samples (Lodi "shale") | |
| | | 130-135 | 53 | | | |
| FRANCONIA | | 135-195 | 5 | | Sandstone, very fine, yellow, dolomitic, hard (Lodi) | |
| | | | | | Dolomite, gray, sandy (St. Lawrence) | |
| | | 195-200 | 60 | | | |
| | | 200-285 | 5 | | No sample | |
| DRESBACH | | | | | Sandstone, fine to exceedingly fine, green, calcareous, glauconitic (no sample 225-235) | |
| | | 285-295 | 85 | | | |
| | | 295-305 | 10 | | Sandstone, exceedingly fine, gray, calcareous | |
| | | 305-315 | 10 | | Sandstone, like above, harder, glauconitic (shale) | |
| EAU CLAIRE | | 315-450 | 10 | | Sandstone, coarse, gray, calcareous, glauconitic (brown) | |
| | | | | | Sandstone, coarse, white to light gray | |
| | | 450-465 | 135 | | | |
| | | 465-475 | 15 | | Sandstone, fine to medium, white | |
| | | 475-515 | 10 | | Sandstone, fine to medium, gray, dolomitic, hard | |
| | | | | | Sandstone, fine to very fine, gray, calcareous, glauconitic | |
| | | 515-545 | 40 | | | |
| | | | | | Sandstone, fine, gray and pink, calcareous, hard | |
| | | 545-555 | 30 | | | |
| | | 555-565 | 10 | | Sandstone, very fine, gray, very calcareous | |
| | | 565-570 | 10 | | Shale, gray, slightly calcareous | |
| | | 570-580 | 5 | | Sandstone, fine, pink, calcareous | |
| | | 580-710 | 10 | | Sandstone, medium, gray; shale, gray, hard | |
| | | | | | Sandstone, medium, light gray, slightly calcareous | |
| 287 | | 710-720 | 130 | | | |
| | | 720-730 | 10 | | Sandstone, coarse to fine, light gray | |
| | | 730-752 | 10 | | Sandstone, fine, light gray | |
| | | | 22 | | Sandstone, very coarse to fine, light gray | |



4 6" hole

Flow
Main Flow

ht. Summ.

R. 1W.

| | | | | |
|----|--|--|--|--|
| T. | | | | |
| 3 | | | | |
| N. | | | | |

Sec. 9

Page 1 of 4

Well name City of Platteville, Wisconsin, Well #4
Sample Nos. 285848 to 286040

| | | | | |
|---------------------------------|---------|----|--|---|
| S T P E T E R | 190-195 | 5 | | Ss, V lt ol gry, C, tr G dk rd bn qtz-cem, mch M&VC, tr fn&Vfn; |
| | 195-200 | 5 | | Ss, V lt ol gry, C, tr G dol-&pyr-cem, mch VC, ltl M, tr fn; |
| | 200-205 | 5 | | Ss, V lt ol gry, C, slgt tr dol-, pyr-&lim-cem, ltl M&VC, tr fn&Vfn; |
| | 205-210 | 5 | | Ss, V pl gry or, C, rnd/Sang, P srtg, mch M, ltl fn&VC, tr Vfn; tr dol, lim |
| | 210-220 | 10 | | Ss, V pl gry or, M, rnd/Sang, P srtg, mch C&fn, tr VC&Vfn; tr dol, lim, st &cl |
| | 220-225 | 5 | | Ss, pl yl or, M, rnd&Srnd, F srtg, ltl C&fn; ltl yl or dissag dol, tr st |
| | 225-230 | 5 | | Ss, pl yl or, M, rnd&Srnd, ltl C&fn, tr Vfn; ltl yl or dissag dol |
| | 230-240 | 10 | | Ss, pl yl or, M, rnd&Srnd, P srtg, mch P sft yl or dol-cem, mch fn, ltl C, tr Vfn; tr gry gn sh&st |
| | 240-245 | 5 | | Sh, gry yl or, P srtg, calcs, sft, ltl gry gn hd pyric sh; mch fn/C snd |
| | 245-255 | 10 | | Ss, V pl or, C&M, rnd/Sang, P srtg, slgt tr lim-cem, mch fn, tr Vfn&VC; ltl gry yl or&gry gn sh, tr xln dol |
| | 255-260 | 5 | | Ss, V pl or, M, rnd&Srnd, tr sft yl or dol-cem, mch C&fn, tr VC&Vfn; ltl |
| | 260-270 | 10 | | Ss, V pl or, M, rnd&Srnd, P srtg, mch fn&hd gry gn sh, tr st&yl bn dol C, tr Vfn&VC; tr st gry gn sh&xln dol |
| | 270-280 | 10 | | Ss, V pl yl or, M&C, Srnd, P srtg, slgt tr lim-cem, ltl fn; slgt tr dol |
| | 280-285 | 5 | | Ss, V pl yl or, M, Srnd, P srtg, slgt tr lim-cem, mch C&fn, tr Vfn; tr st |
| | 285-290 | 5 | | Ss, V pl yl or, M&C, slgt tr lim&pyr-cem, ltl fn, tr Vfn&VC; tr gn sh, dol |
| | 290-300 | 10 | | Ss, V pl yl gry, M, Srnd, P srtg, slgt tr lim-cem, mch C&fn, tr Vfn; tr st dol&gn sh |
| | 300-305 | 5 | | Ss, V pl or, C, rnd, tr pyr-&lim-cem, mch M, ltl fn, tr Vfn&VC; tr yl gry |
| | 305-315 | 10 | | Ss, V pl or, M, Srnd, P srtg, tr pur-&lim-cem, mch C&fn, tr Vfn&sh&st VC; tr st |
| | 315-320 | 5 | | Ss, V pl yl or, M&C, Srnd, ltl P sft yl or dol-cem, ltl fn&VC, tr Vfn; |
| | 320-330 | 10 | | Ss, yl gry, M, Srnd, slgt tr pyr-&lim-cem, mch C&fn, tr VC&Vfn; tr st, dol &gn sh |
| | 330-335 | 5 | | Ss, yl gry, M&C, Srnd, tr pyr-&lim-cem, mch fn, ltl VC, tr Vfn; tr st |
| | 335-340 | 5 | | Ss, V pl or, M, rnd&Srnd, P srtg, mch fn&C, tr Vfn&VC; slgt tr st&gn sh |
| | 340-345 | 5 | | Ss, V pl or, M&C, rnd, F srtg, ltl VC, tr fn&Vfn; |
| | 345-350 | 5 | | Ss, V pl or, C, rnd, F srtg, ltl M&VC, slgt tr fn&Vfn; tr st&pyr |
| | 350-360 | 10 | | Ss, yl gry, M&C, rnd, P srtg, slgt tr dol-&pyr-cem, ltl fn, tr VC&Vfn; ltl lt gry sndy sh, tr st&glauc |
| | 360-365 | 5 | | Sh, lt gry, V lt gry&pl bn, P srtg, vrbl hdns; ltl Vfn/VC snd, ltl wea cht |
| | 365-370 | 5 | | Sh, pl gn, P srtg, vrbl hdns; ltl Vfn/M snd, tr cht, dol, pyr&glauc |
| | 370-375 | 5 | | Congl, wh, pl yl bn&pl gry or, fn&Vfn gvl, mstly cht&oolic cht, ltl dol; |
| | 375-380 | 5 | | Congl, wh, pl yl bn&pl gry or, fn&Vfn gvl, mstly cht&oolic cht&dol; |
| | 380-385 | 5 | | Sh, pl gn, P srtg, vrbl hdns, mst hd; ltl dol&cht gvl, tr Vfn/C snd |
| | 385-390 | 5 | | Sh, V pl gn&yl gry, P srtg, sft; mch dol, gvl, tr cht, ltl Vfn/VC snd |
| | 390-395 | 5 | | Dol, V pl or, fn, dns, tr por, ltl Vfn, tr M&C, tr sug tex; slgt tr oolic cht |
| | 395-400 | 5 | | Sh, V pl gn&yl gry, P srtg, vrbl hdns; ltl dol&cht gvl, ltl Vfn/C snd |
| P R A I R I E | 400-405 | 5 | | Dol, V pl or mot yl gry, fn, dns, tr por, ltl Vfn, tr M&C, tr sug tex; |
| | 405-415 | 10 | | Dol, V pl or, wh&V pl gry or, fn, dns, ltl Vfn, tr M, tr oolic; mch vari clrd cht, tr oolic, tr qtz, tr M&C snd, gn sh&Vfn/VC xln pyr |
| | 415-420 | 5 | | Dol, pl rd, or pnk&yl gry, fn&Vfn, dns, sug tex; ltl cht, tr oolic |
| | 420-425 | 5 | | Dol, or pnk&pl yl bn, fn, dns, tr Vfn&M; mch cht&oolic cht (wh&pl yl bn) |
| | 425-430 | 5 | | Dol, or pnk&pl yl bn, fn, dns, tr M&Vfn, tr por; mch cht&oolic cht |
| | 430-435 | 5 | | Dol, or pnk&pl yl bn, fn, dns, ltl Vfn, tr M, tr por, ltl sndy (fn/C), tr |
| | 435-445 | 10 | | Dol, gry or mot yl gry&or pnk< rd, M&fn, dns, ltl Vfn, tr C, oolic; tr oolic, tr sndy (fn/C), tr sug tex; ltl cht, tr oolic, tr drsy qtz |
| | 445-450 | 5 | | Dol, or pnk, V pl or, V pl yl bn&yl gry, fn, dns, ltl M&Vfn, tr C, tr oolic |
| | 450-455 | 5 | | Dol, or pnk, V pl or, V pl yl bn&yl gry, fn, dns, ltl Vfn, tr M, ltl |
| | 455-460 | 5 | | Dol, or pnk, fn&Vfn, dns, sndy (mstly fn), tr oolic; mch gn&gry gn sh |
| S T L | 460-465 | 5 | | Sh, V pl gry gn, mstly sft, ltl vrbl hdns, ltl ol gry, slgt dol;c |
| | 465-470 | 5 | | Dol, or pnk, yl gry, yl or&V pl or, fn&Vfn, dns, sndy (fn/C); mch fn/C snd |
| | 470-475 | 5 | | Sh, V pl gry gn, mst sft; ltl fn&M snd, ltl dol, tr cht, drsy qtz, pyr |
| | 475-485 | 10 | | Dol, yl gry, V pl or&or pnk, fn&Vfn, dns, sndy (fn/C); mch gn&gry gn sh, ltl cht, tr fn/VC snd, tr pyr&glauc |
| | 485-490 | 5 | | Ss, V pl or, M, ltl G dol-cem, mch fn, ltl C, tr VC; ltl cht, dol, gn sh |
| | 490-495 | 5 | | Ss, V pl or, M, tr G dol-cem, mch C&fn, tr Vfn&VC; ltl cht, dol&gn sh |
| | 495-500 | 5 | | Ss, V pl or, M, mch C&fn, tr Vfn&VC; mch gry gn sh, mch cht, ltl dol |
| | 500-505 | 5 | | Ss, V pl or, M&fn, ltl G dol-cem, ltl C, tr Vfn; mch V pl gry gn sh, tr cht |
| | 505-510 | 5 | | Ss, V pl or, fn, ltl G dol-cem, ltl Vfn, tr M&C; ltl gn&ol gry sh, tr cht |
| | 510-515 | 5 | | Ss, V pl or, fn, mch G dol-cem, ltl Vfn, tr M/VC; ltl gn sh, tr cht&pyr |
| J O R D | 515-520 | 5 | | Ss, V pl or, fn&Vfn, mch G dol-cem, tr M; tr cht, gn, gn gry&ol gry sh |
| | 520-525 | 5 | | Dol, V pl or mot lt rd, fn&Vfn, dns, tr sndy (M&fn); mch gry gn sh |
| | 525-530 | 5 | | Dol, gry or pnk, Vfn, dns, ltl fn, ltl sug tex; ltl gry gn mica sh, tr ol |
| | 530-540 | 10 | | Dol, gry or pnk, fn&Vfn, dns, ltl sug tex, tr sndy; ltl gry, ltl M&C snd gry gn mot ol gry sh, ltl fn/C snd, tr VC, tr pyr |
| | 540-555 | 15 | | Dol, gry or pnk, fn&Vfn, dns, tr M&C; tr sh, cht, oolic cht, drsy qtz&M/VC snd |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
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| | | | | |

Sample Nos. 285848 to 286040

Page 3 of 4

Well name City of Platteville, Wisconsin, Well #4
Sample Nos. 285848 to 286040

W
O
N

E.
C. 10'

| | | | |
|---------|----|---|--|
| 930-940 | 10 | | Ss, vl gry, M, rnd, G srtg, tr F lim-cem, ltl fn, tr C; |
| 940-945 | 5 | G | Ss, V lt ol gry, fn, tr F lim-&dol-cem, ltl M, tr Vfn&C; tr st, pyr&glauc |
| 945-950 | 5 | G | Ss, V lt ol gry, M, ltl G gry dol-cem, tr lim-cem, ltl fn&C, tr Vfn; |
| 950-955 | 5 | A | Ss, V lt ol gry, M&fn, ltl P gry dol-cem, tr lim-cem, tr C&Vfn; ltl gry |
| 955-960 | 5 | G | Ss, gry or pnk, fn, ltl P gry dol-cem, tr lim-cem, ltl M, tr Vfn; ltl gry |
| 960-965 | 5 | G | Ss, V lt ol gry, fn, ltl F dol-cem, ltl M, tr Vfn; mch lt ol gry sh, tr glauc, pyr&foss frags |

END OF LOG

Duplicate samples

| | | | |
|---------|---|--|---|
| 125-130 | 5 | | sug tex; ltl lt bn sh, tr xln pyr&C xln calc&cht+foss frags |
| 130-135 | 5 | | M, ltl Vfn, ltl fossif; tr pyr, calc, gry&bn sh&cht, foss frags |
| 150-155 | 5 | | &C, ltl fossif, tr sug tex; slgt tr pyr&dk bn sh |
| 160-165 | 5 | | ltl micro xln; tr xln&dissem pyr |
| 445-450 | 5 | | ltl sndy(fn/C); ltl pl gn sh, tr gry gn, tr ools, cht&drzy qtz |
| 450-455 | 5 | | sndy(fn/C), ltl oolic; tr cht, ools, oolic cht, pyr&gn sh |

Additional Abbreviations: vrb1-variable
hdns-hardness
tex-texture

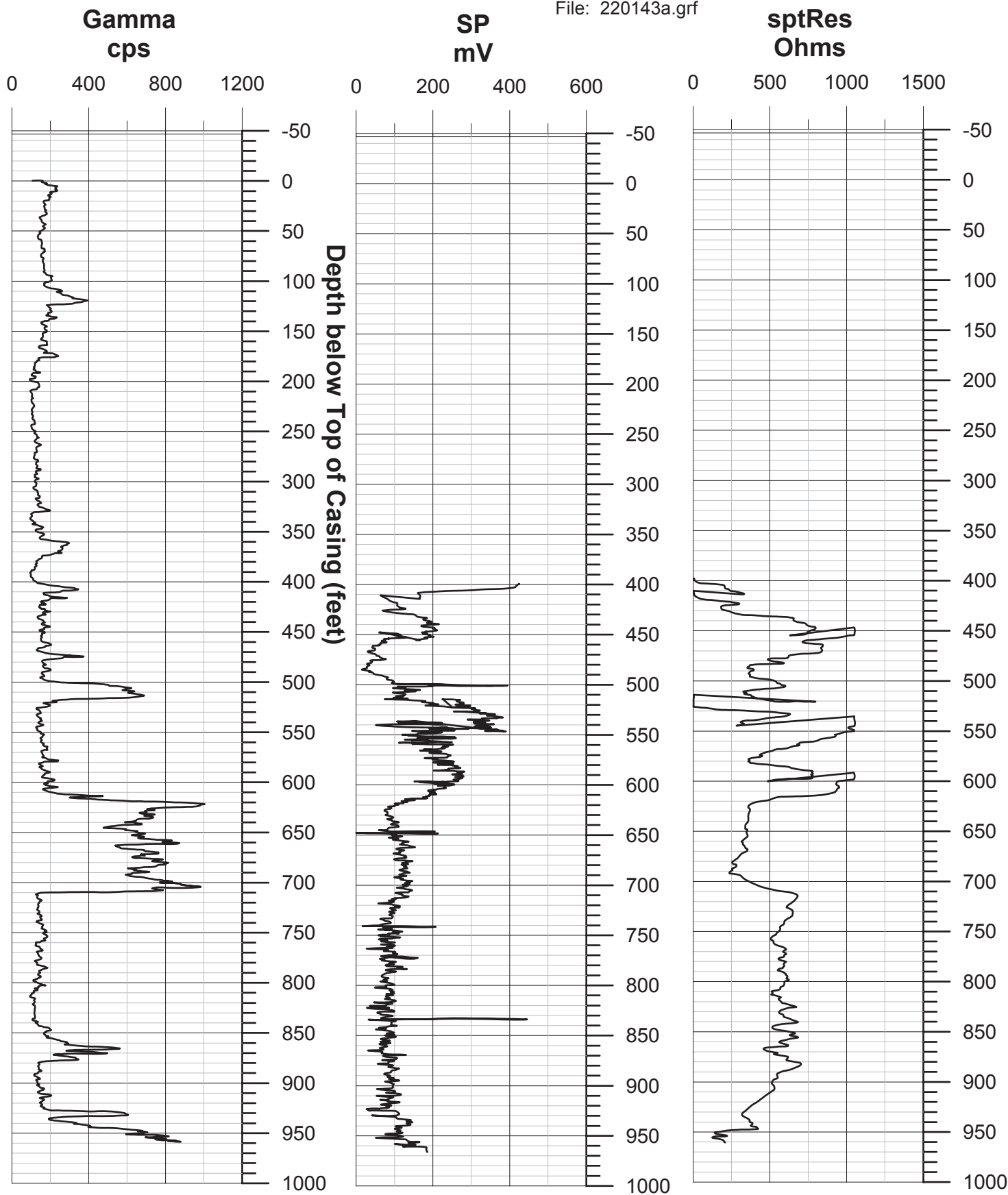
Total Depth: 960 ft
Casing: 408 ft
Elevation: 965 ft

Well: GR-143 Platteville City Well #4

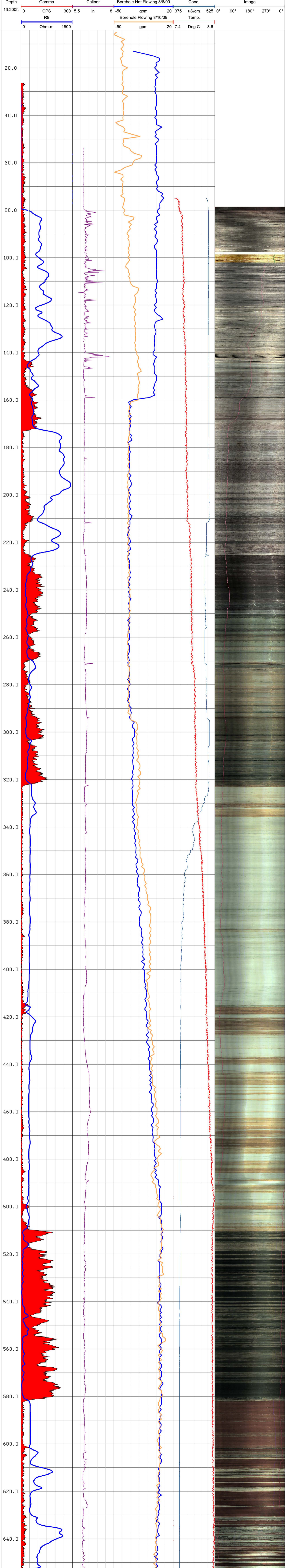
T3N, R1W, section 9, SE1/4, SW1/4, SE1/4

File: 220143a.grf

Wisconsin Geological &
Natural History Survey



| | |
|---|--|
| WELL ID: <u>25000512</u> | WELL NAME: <u>Highway A Quarry Test Hole</u> |
| DATE: <u>8/6/2009</u> | LOCATION: <u>42.87741717, -89.87499342</u> <small>Quarter, Section, Township, Range/ LAT-LONG/ WTM</small> |
| County: <u>Iowa</u> | Elevation: <u>850 ft amsl</u> |
| Well Depth (Logger): <u>660 ft</u> | Logged by: <u>Chase, Batten, Hart, Gotkowitz</u> |
| Depth to Water: _____ Casing Depth: <u>80 ft</u> Casing Stick-up: _____ | |
| Comment: <u>Well drilled 3/30/2007</u> | |
| | |
| LOGS COLLECTED: | |
| Gamma X | Fluid Conductivity X |
| Caliper X | Flow Meter- HeatPulse |
| Single Point Resistivity | Flow Meter- Spinner X |
| Self Potential | Optical Borehole Imager X |
| Normal Resistivity X | Acoustic Borehole Imager |
| Fluid Temperature X | OTHER: |



WGNHS Well ID 11005900



Wisconsin Geological & Natural History Survey

DATE 11/1 & 11/4/13 WELL NAME Triemstra Quarry

LOCATION NW corner of quarry 1km W, .75km N of intersection of CTH EE & E

Wisconsin Geological & Natural History Survey

COUNTY Columbia

LOGGED BY P. Chase

LATITUDE 43.620585

LONGITUDE -89.274949

LOCATION METHOD: GPS [X] AIR PHOTO/TOPO [] PLSS [] OTHER []

ELEVATION 920 ELEVATION METHOD: DEM [] TOPO [] OTHER 10M DEM []

WELL DEPTH 605 CASING DEPTH 9 DEPTH TO WATER 123.8

CASING STICK UP 0.4

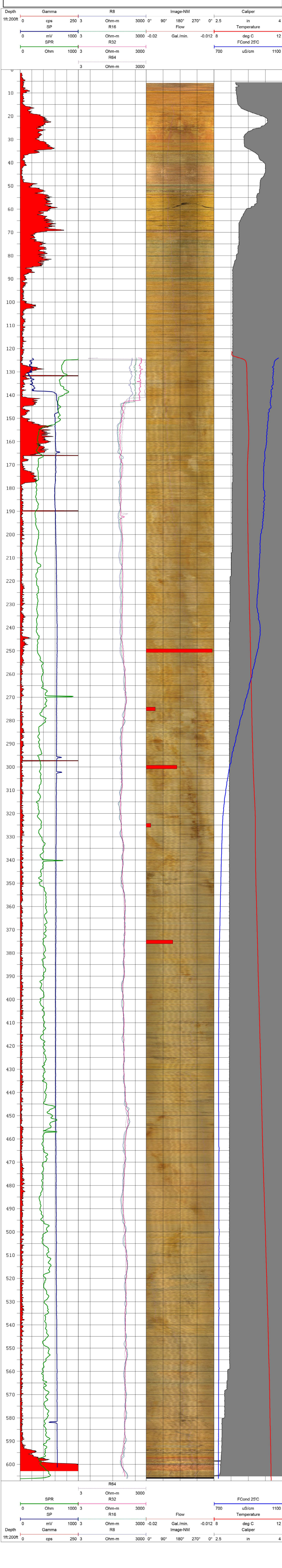
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Comments:

LOGS COLLECTED:

Gamma [X] Fluid Conductivity [X]
Caliper [X] Flow Meter- HeatPulse [X]
Single Point Resistivity [X] Flow Meter- Spinner []
Self Potential [X] Optical Borehole Imager [X]
Normal Resistivity [X] Acoustic Borehole Imager []
Fluid Temperature [X] OTHER: []

Unless Noted:
- all depths are in feet
- well depth, casing depth and depth to water are interpreted from geophysical log
- datum is the top of casing



WGNHS Well ID 14001384



Wisconsin Geological & Natural History Survey

DATE 8/15/2012

WELL NAME Alsum Quarry Corehole 4

LOCATION Randolph, WI

Wisconsin Geological & Natural History Survey

COUNTY Dodge

LOGGED BY Peter Chase, Steve Sellwood

LATITUDE 43.593864

LONGITUDE -88.997651

LOCATION METHOD: GPS AIR PHOTO/TOPO PLSS OTHER

ELEVATION 970 ELEVATION METHOD: DEM TOPO OTHER

WELL DEPTH 305 CASING DEPTH 17 DEPTH TO WATER 19

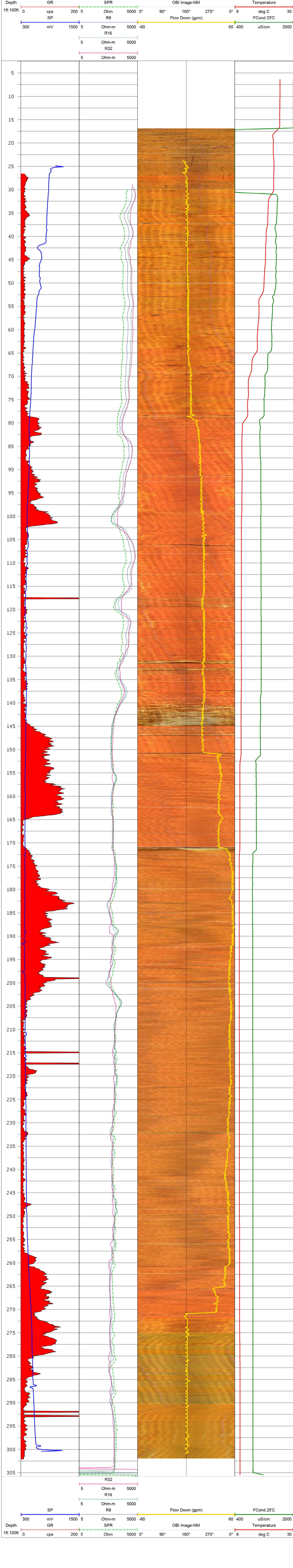
CASING STICK UP 0 File Created on: 4/26/2013 by: HSD

Comments: Casing depth reported at site of 20'. Cascading water at approximately 30'

LOGS COLLECTED:

Gamma X Fluid Conductivity X
Caliper Flow Meter- HeatPulse
Single Point Resistivity X Flow Meter- Spinner X
Self Potential X Optical Borehole Imager X
Normal Resistivity X Acoustic Borehole Imager X
Fluid Temperature X OTHER: Spectral Gamma X

Unless Noted:
- all depths are in feet
- casing and depth to water are interpreted from geophysical log
- datum is the top of casing



Title: Geologic Log

Site Name: WG&NHS Rio Test Hole

County: COLUMBIA
Completed: 2012
Field Check:

Owner: WG&NHS
Address:

Driller(s): Webster & Sons Drilling, Inc.
Engineer:

Elevation: 1035 ±20'
Well Use: stratigraphy
Static Level:

Location: NE, SW, NW,
Sec. 12, T11N, R10E

Topo Name: Wyocena
Sample Nos.: AR106
Perm No.:
WI-Unique ID#:

Pump Test:

Samples Rec'd:

Studied By:
Lauren L. Lande 0' to 743'

| Drill Hole Dimensions | | | Drilling Method | | |
|-----------------------|------|----|----------------------|------|------|
| Diameter | From | To | Method | From | To |
| | | | air rotary with foam | 0' | 738' |

| Grout | | |
|-------|------|----|
| Kind | From | To |
| | | |

| Open Interval Characteristics | | | |
|-------------------------------|------|----|--------------|
| Diameter | From | To | Opening Type |
| | | | |

| Casing & Liner Information | | | | |
|----------------------------|------|----|--------|--------|
| Diameter | From | To | Casing | Weight |
| | | | | |

Types of records available for this site
(* indicates indexing term):

*geophysical log(s) exist, *no original well construction report,
Formation log, Geologic log, *subsurface boring (non-core)
site, Drill cuttings available

Formations:

Prairie du Chien Group, Jordan Formation, St. Lawrence
Formation, Tunnel City Group, Elk Mound Group

Log Comments:





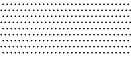
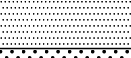

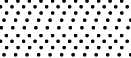
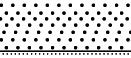
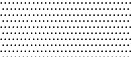
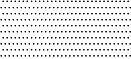
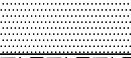



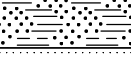
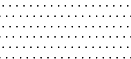
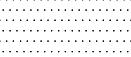
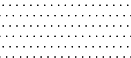
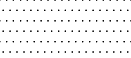
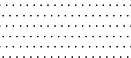
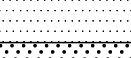
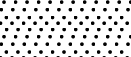


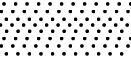




Samples look very good and formation boundaries match very well with those from a well at Fall River (CO-77). The Jordan is well cemented by dolomite. The Tunnel City is a very fine to medium sandstone with much glauconite and less dolomite cement. No apparent Eau Claire. Precambrian not reached.
Test hole reported to be 738 feet deep but sample bags are marked to 743 feet.
Test hole is located a mile southwest of Rio, Wisconsin. Prairie du Chien Group at the surface at the drillhole site.
What was the well construction completion date?

This geologic log has undergone basic review. Some information may need to be added or further reviewed. If essential information is missing or incorrect, please contact the WG&NHS Subsurface Lab at (608)-263-4004 or FAX (608)-262-8086.

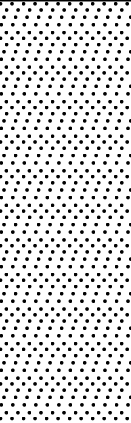
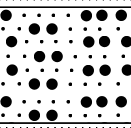
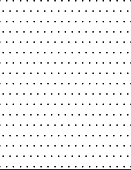
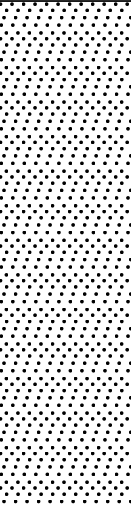
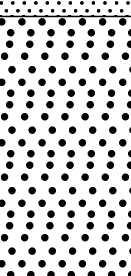
Version tracking:

2/11/2013 Initial digital version.

Site Name: WG&NHS Rio Test Hole**Title: Geologic Log**

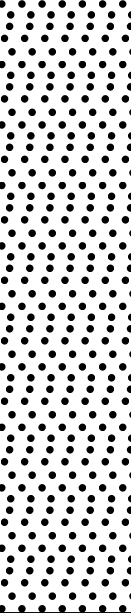
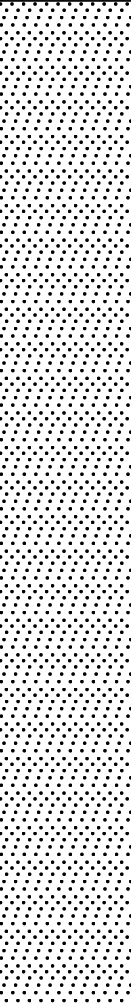
| | Depths | Graphic | RockType | Color | Mode | Range | Miscellaneous Characteristics |
|------------------------|---------|---|-------------------|----------------------|------|--------|---|
| Prairie du Chien Group | 0-5 |  | dolomite | grey brown | M | Fn/M | Granular. Few oolites, floating sand grains. |
| | 5-10 |  | dolomite | grey brown | M | Fn/M | Granular. Very oolitic. Trace white chert. |
| | 10-15 |  | dolomite | lt brown | M | Fn/M | Granular. Very oolitic. Trace white chert, floating sand grains. Little pyrolusite. |
| | 15-20 |  | dolomite | lt brown | M | Fn/M | Granular. Very oolitic. Trace white chert, floating sand grains. Little pyrolusite. |
| Jordan Formation | 20-22 |  | sandstone | lt grey brown | Fn | Vfn/C | Many oolitic pieces. Much dolomitic cement. Little dolomite, pyrolusite. Trace limonite cement, white chert. HCl test. Much dolomitic cement. Little dolomite, pyrolusite. Trace limonite cement, white chert. 2 HCl test. Much dolomitic cement (limey). Trace limonite cement, pyrolusite, lt grey shale. |
| | 19-22 |  | sandstone | lt brown | Fn | Vfn/C | |
| | 22-27 |  | sandstone | pale yellow brown | Vfn | Vfn/M | |
| | 27-32 |  | sandstone | pale yellow brown | Vfn | Vfn/M | Much dolomitic cement. Trace pyrolusite, lt grey shale. |
| | 32-37 |  | sandstone | lt brown | M | Vfn/C | Much dolomitic cement (limey). Trace pyrolusite, lt grey shale. HCl test. |
| | 37-42 |  | sandstone | lt brown | M | Vfn/C | Much dolomitic cement. Trace limonite cement, pyrolusite, lt grey shale. |
| | 42-47 |  | sandstone | lt brown | M | Vfn/C | Much dolomitic cement. Little lt grey and lt brown shale. Trace limonite cement, pyrolusite. |
| | 47-52 |  | sandstone | pale yellow brown | Vfn | Vfn/C | Much dolomitic cement. Trace lt brown shale. HCl test. |
| | 52-57 |  | sandstone | pale yellow brown | Vfn | Vfn/C | Much dolomitic cement. Trace lt brown shale. |
| | 57-62 |  | sandstone | pale yellow brown | Vfn | Vfn/C | Much dolomitic cement. Little lt brown shale. |
| St. Lawrence Formation | 62-67 |  | sandstone & shale | red brown | Fn | Vfn/M | Sandstone is poorly sorted. Much dolomitic cement, red shale. Trace Fn glauconite. |
| | 67-72 |  | shale | red brown | -- | -- | Little dolomitic cemented sandstone. |
| | 72-77 |  | shale | red brown | -- | -- | Little dolomitic cemented sandstone. |
| | 77-82 |  | sandstone & shale | grey/brown/red brown | M | Vfn/C | Sandstone is poorly sorted. Much dolomitic cement (limey). HCl test. |
| Tunnel City Group | 82-87 |  | sandstone | lt red brown | Fn | Vfn/M | Much dolomitic cement, Fn glauconite. Little red shale. |
| | 87-92 |  | sandstone | lt red brown | Fn | Vfn/M | Much dolomitic cement, Fn/M glauconite. |
| | 92-97 |  | sandstone | pale red brown | Fn | Vfn/M | Much dolomitic cement. Little Fn/M glauconite, lt red shale. |
| | 97-102 |  | sandstone | pale red brown | Fn | Vfn/M | Much Fn/M glauconite. Little dolomitic cement, lt red shale. |
| | 102-107 |  | sandstone | lt brown | Fn | Vfn/M | Much Fn/C glauconite, dolomitic cement. |
| | 107-112 |  | sandstone | lt brown | Fn | Vfn/M | Much dolomitic cement. Trace Fn/M glauconite, red shale. |
| | 112-117 |  | sandstone | lt brown | M | Vfn/C | Much dolomitic cement. Trace Fn/M glauconite, red shale. |
| | 117-122 |  | sandstone | lt brown | M | Vfn/C | Much dolomitic cement (limey). Few calcite crystals. Trace Fn/M glauconite, red and white shale. HCl test. |
| | 122-127 |  | sandstone | lt brown | M | Vfn/C | Much dolomitic cement. Trace lt brown shale. |
| | 127-132 |  | sandstone | lt brown | M | Vfn/VC | Much dolomitic cement. Trace lt brown shale. |
| | 132-137 |  | sandstone | lt brown | M | Vfn/VC | Much dolomitic cement. Trace lt grey shale, Fn glauconite. |
| | 137-142 |  | sandstone | lt brown | M | Vfn/VC | Much dolomitic cement. Trace lt grey/white shale. |

Site Name: WG&NHS Rio Test Hole**Title: Geologic Log**

| | Depths | Graphic | RockType | Color | Mode | Range | Miscellaneous Characteristics |
|-------------------|---------|---|-----------|-------------------|--------|--------|---|
| Tunnel City Group | 137-142 |  | sandstone | lt brown | M | Vfn/VC | Much dolomitic cement. Trace lt grey/white shale. |
| | 142-147 | | sandstone | lt brown | M | Vfn/VC | Much dolomitic cement. Trace lt grey/white shale. |
| | 147-152 | | sandstone | lt brown | M | Vfn/VC | Much dolomitic cement. Trace lt grey/white shale. |
| | 152-157 | | sandstone | lt brown | M | Vfn/VC | Much dolomitic cement (limey). Trace lt grey/white shale. 2 HCl test. |
| | 157-162 | | sandstone | lt brown | M | Vfn/VC | Much dolomitic cement. Little lt grey/white shale. |
| | 162-167 | | sandstone | v v lt brown | M | Vfn/VC | Much dolomitic cement, lt grey/white shale. Sandstone poorly sorted. |
| | 167-172 | | sandstone | lt brown | M | Vfn/VC | Much dolomitic cement. Little lt grey/white shale. Trace pyrolusite. |
| | 172-177 | | sandstone | lt brown | M | Vfn/VC | Much dolomitic cement. Little lt green shale, Fn glauconite. Trace pyrolusite. |
| | 177-182 | | sandstone | pale yellow brown | Fn | Vfn/M | Transitional Wonewoc/Tunnel City. Much dolomitic cement, lt brown shale. Little Fn glauconite. HCl test. |
| | 182-187 | | sandstone | pale grey brown | Fn | Vfn/VC | Transitional Wonewoc/Tunnel City. Much dolomitic cement, lt grey brown shale. Little Fn glauconite. |
| Elk Mound Group | 187-192 |  | sandstone | v v lt brown | M & VC | Fn/Gr | Little silica cement. Only Fn/M grains are cemented. Trace lt grey shale, lt green shale, Fn glauconite. Few pink 8 mm quartz grains. 3 HCl test. |
| | 192-197 | | sandstone | v v lt brown | M & VC | Fn/VC | Small sample size. Little silica cement. Only Fn/M grains are cemented. Trace lt grey shale, lt green shale, Fn glauconite, dolomitic cement. |
| | 197-202 |  | sandstone | v lt brown | Fn | Fn/VC | Small sample size. Much dolomitic cement. Little silica cement, Fn glauconite. Few coarse grains are uncemented. Trace lt grey shale. HCl test. |
| | 202-207 | | sandstone | v v lt brown | Fn | Vfn/VC | Little M/C glauconite. Trace lt brown shale. HCl test. |
| | 207-212 | | sandstone | v v lt brown | Fn | Vfn/VC | Little M glauconite. Trace lt grey shale. |
| | 212-217 |  | sandstone | v v lt brown | M | Fn/VC | Trace silica cement, M glauconite. |
| | 217-222 | | sandstone | v v lt brown | M | Fn/VC | Trace silica cement, Fn/M glauconite. |
| | 222-227 | | sandstone | v v lt brown | M | Fn/VC | Trace silica cement, Fn/M glauconite. |
| | 227-232 | | sandstone | v v lt brown | M | Fn/VC | Trace silica cement, lt brown shale. |
| | 232-237 | | sandstone | v v lt brown | M | Fn/VC | Trace silica cement, lt brown shale, Fn glauconite. |
| | 237-242 | | sandstone | v v lt brown | M | Fn/VC | Trace silica cement, lt green shale, Fn glauconite. |
| | 242-247 | | sandstone | v v lt brown | M | Fn/VC | Trace silica cement. Little yellow green shale. |
| | 247-252 | | sandstone | v v lt brown | M | Fn/VC | Trace silica cement, yellow green shale, M glauconite. |
| | 252-257 | | sandstone | v v lt brown | M | Fn/VC | Trace silica cement, yellow green shale, M glauconite. |
| | 257-262 |  | sandstone | v v lt brown | C | Fn/VC | Trace silica cement. |
| | 262-267 | | sandstone | lt yellow brown | C | Fn/VC | Trace silica cement. About 7% yellow grains (coated in iron oxide). |
| | 267-272 | | sandstone | lt yellow brown | C | Fn/VC | Trace silica cement, lt green shale. About 5% yellow grains (coated in iron oxide). |
| | 272-277 | | sandstone | lt yellow brown | C | Fn/VC | Trace silica cement. About 7% yellow grains (coated in iron oxide). |
| | 277-282 | | sandstone | v v lt brown | C | Fn/VC | Trace silica cement, lt brown shale. About 4% yellow grains (coated in iron oxide). |

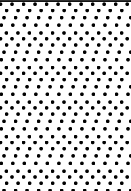
Site Name: WG&NHS Rio Test Hole

Title: Geologic Log



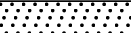






















| | Depths | Graphic | RockType | Color | Mode | Range | Miscellaneous Characteristics |
|-----------------------|---------|--|-----------|--------------|------|-------|---|
| Elk Mound Group | 277-282 |  | sandstone | v v lt brown | C | Fn/VC | Trace silica cement, lt brown shale. About 4% yellow grains (coated in iron oxide). |
| | 282-287 | | sandstone | v v lt brown | C | Fn/VC | Trace silica cement, lt brown shale, M glauconite. |
| | 287-292 | | sandstone | v v lt brown | C | Fn/VC | Trace silica cement, M glauconite. |
| | 292-297 | | sandstone | v v lt brown | C | Fn/VC | Trace silica cement, M glauconite. |
| | 297-302 | | sandstone | v v lt brown | C | Fn/VC | Trace M glauconite, lt brown shale. |
| | 302-308 | | sandstone | v v lt brown | C | Fn/VC | Little silica cement. Trace lt brown shale. HCl test. |
| | 308-313 | | sandstone | v v lt brown | C | Fn/VC | Trace silica cement, Fn/M glauconite. |
| | 313-318 | | sandstone | v v lt brown | C | Fn/VC | Trace silica cement. |
| | 318-323 | | sandstone | v v lt brown | C | Fn/VC | Trace silica cement, M glauconite. |
| | 323-328 | | sandstone | v v lt brown | C | Fn/VC | Trace silica cement. |
| | 328-333 | | sandstone | v v lt brown | C | Fn/VC | Trace silica cement. |
| | 333-338 |  | sandstone | v v lt brown | M | Fn/VC | Trace silica cement. |
| | 338-343 | | sandstone | v v lt brown | M | Fn/VC | Trace silica cement. |
| | 343-348 | | sandstone | v v lt brown | M | Fn/VC | ---- |
| | 348-353 | | sandstone | v v lt brown | M | Fn/VC | Trace silica cement. |
| | 353-358 | | sandstone | v v lt brown | M | Fn/VC | Trace silica cement, Fn glauconite. |
| | 358-363 | | sandstone | v v lt brown | M | Fn/VC | Trace silica cement. |
| | 363-368 | | sandstone | v v lt brown | M | Fn/VC | Very small sample size. Much silica cement. Little lt brown shale, M glauconite. |
| | 368-373 | | sandstone | v v lt brown | M | Fn/VC | Trace silica cement. |
| | 373-378 | | sandstone | v v lt brown | M | Fn/VC | Trace silica cement. |
| | 378-383 | | sandstone | v v lt brown | M | Fn/VC | -- |
| | 383-388 | | sandstone | v v lt brown | M | Fn/VC | Trace silica cement. |
| | 388-393 | | sandstone | v v lt brown | M | Fn/VC | Trace silica cement. Some organic material mixed in. |
| | 393-398 | | sandstone | v v lt brown | M | Fn/VC | Trace silica cement, M glauconite. Some organic material mixed in. |
| | 398-403 | | sandstone | v v lt brown | M | Fn/VC | Trace silica cement. Some organic material mixed in. |
| | 403-408 | | sandstone | v v lt brown | M | Fn/VC | -- |
| | 408-413 | | sandstone | v v lt brown | M | Fn/VC | Trace silica cement. |
| | 413-418 | | sandstone | v v lt brown | M | Fn/VC | Trace silica cement. |
| | 418-423 | | sandstone | v v lt brown | M | Fn/VC | Trace silica cement. |

Site Name: WG&NHS Rio Test Hole

Title: Geologic Log


| | Depths | Graphic | RockType | Color | Mode | Range | Miscellaneous Characteristics |
|-----------------------|---------|---|-----------|-------------------|------|-------|---|
| Elk Mound Group | 418-423 |  | sandstone | v v lt brown | M | Fn/VC | Trace silica cement. |
| | 423-428 | | sandstone | v v lt brown | M | Fn/VC | Trace silica cement, M glauconite. |
| | 428-433 | | sandstone | v v lt brown | M | Fn/VC | Trace silica cement. |
| | 433-438 | | sandstone | v v lt brown | M | Fn/VC | Very small sample size. Much silica cement. |
| | 438-443 | | sandstone | v pale red brown | M | Fn/VC | Trace hematite cement. 10% pink grains. |
| | 443-448 | | sandstone | pink brown | M | Fn/VC | Much hematite cement. 50% pink grains. |
| | 448-453 | | sandstone | v v lt brown | M | Fn/VC | Trace silica cement. |
| | 453-458 | | sandstone | v v lt brown | M | Fn/VC | Trace silica cement. |
| | 458-463 | | sandstone | v v lt brown | M | Fn/VC | Trace silica cement, lt grey shale. |
| | 463-468 | | sandstone | v v lt brown | M | Fn/VC | Trace silica cement, Fn glauconite. |
| | 468-473 | | sandstone | v pale red brown | M | Fn/VC | Trace hematite cement. 10% pink grains. |
| | 473-478 | | sandstone | v v lt brown | M | Fn/VC | Trace silica cement. |
| | 478-483 | | sandstone | v v lt brown | M | Fn/VC | Trace silica cement. |
| | 483-488 | | sandstone | v v lt brown | M | Fn/VC | Trace silica cement, Fn glauconite. |
| | 488-493 | | sandstone | v v lt brown | M | Fn/VC | Trace silica cement. |
| | 493-498 | | sandstone | v v lt brown | M | Fn/VC | Trace silica cement. |
| | 498-503 | | sandstone | pink brown | M | Fn/VC | Little hematite cement. 30% pink grains. |
| | 503-508 | | sandstone | pale yellow brown | M | Fn/VC | Trace silica cement. |
| | 508-513 | | sandstone | pale yellow brown | M | Fn/VC | Trace silica cement. |
| | 513-518 | | sandstone | pale yellow brown | M | Fn/VC | Trace silica cement. |
| | 518-523 | | sandstone | pale yellow brown | M | Fn/VC | Trace silica cement. Some organic material in sample. |
| | 523-528 | | sandstone | pale yellow brown | M | Fn/VC | Trace silica cement. |
| | 528-533 | | sandstone | pale yellow brown | M | Fn/VC | Trace silica cement. |
| | 533-538 | | sandstone | pale yellow brown | M | Fn/VC | Trace silica cement. |
| | 538-543 | | NO SAMPLE | | | | |
| | 543-548 |  | sandstone | pale yellow brown | M | Fn/VC | Trace silica cement, Fn glauconite. |
| | 548-553 | | sandstone | pale yellow brown | M | Fn/VC | Trace silica cement. |
| | 553-558 | | sandstone | pale yellow brown | M | Fn/VC | Trace silica cement. |
| | 558-563 | | sandstone | pale pink brown | M | Fn/VC | Trace silica cement. 15% pink grains. |

Title: Geologic Log

| | Depths | Graphic | RockType | Color | Mode | Range | Miscellaneous Characteristics |
|-----------------------|---------|---|-----------|-------------------------|------|--------|--|
| Elk Mound Group | 558-563 |  | sandstone | pale pink brown | M | Fn/VC | Trace silica cement. 15% pink grains. |
| | 563-568 | | NO SAMPLE | | | | |
| | 568-573 |  | sandstone | v v lt brown | M | Fn/VC | Trace silica cement. |
| | 573-583 | | NO SAMPLE | | | | |
| | 583-588 |  | sandstone | v v lt brown | M | Fn/VC | Trace silica cement. |
| | 588-593 |  | sandstone | pale yellow brown | M | Fn/VC | Trace silica cement. |
| | 593-598 |  | sandstone | pale yellow brown | M | Fn/VC | Trace silica cement. |
| | 598-603 |  | sandstone | v lt brown | C | Fn/VC | Trace silica cement. |
| | 603-608 |  | sandstone | v lt brown | M | Fn/VC | Trace silica cement. |
| | 608-613 |  | sandstone | v lt brown | M | Fn/VC | Trace silica cement. |
| | 613-618 |  | sandstone | v lt brown | M | Fn/VC | Trace silica cement. |
| | 618-623 |  | sandstone | v lt brown | M | Fn/VC | Trace silica cement. |
| | 623-628 |  | sandstone | v lt brown | C | Fn/VC | Very small sample size. Trace silica cement, lt grey shale. |
| | 628-633 |  | sandstone | v lt brown | C | Fn/VC | Trace silica cement. |
| | 633-638 | | NO SAMPLE | | | | |
| | 638-643 |  | sandstone | v lt brown | C | Fn/VC | Trace silica cement, lt grey shale. |
| | 643-648 |  | sandstone | v lt brown | M | Fn/VC | Trace silica cement. |
| | 648-653 |  | sandstone | v lt brown | C | M/Gr | Only a few grains in sample. Trace silica cement. Few quartz granules. |
| | 653-658 |  | sandstone | v lt brown | M | Fn/VC | -- |
| | 658-663 |  | sandstone | v lt brown | M | Fn/VC | -- |
| | 663-668 |  | sandstone | v lt brown & grey brown | M | Fn/VC | Much very good dolomite cemented sandstone. HCl test. |
| | 668-673 |  | sandstone | v lt brown | M | Fn/VC | Trace silica cement. HCl test. |
| | 673-678 |  | sandstone | v lt brown | M | Fn/VC | Trace silica cement, v lt brown shale. |
| | 678-683 |  | sandstone | v lt brown | M | Fn/VC | Trace silica cement, v lt brown shale. |
| | 683-688 |  | sandstone | v lt brown | C | Fn/VC | Little organic material in sample. |
| | 688-693 |  | sandstone | v lt brown | C | Fn/VC | Trace silica cement, organic material in sample. |
| | 693-698 |  | sandstone | v lt brown | M | Vfn/VC | Much very good dolomite cement. Coarser grains are free. HCl test. |
| | 698-703 |  | sandstone | v lt brown | M | Fn/VC | Few pink, purple and yellow quartz granules. Trace lt brown shale. |

Site Name: WG&NHS Rio Test Hole

Title: Geologic Log

| | Depths | Graphic | RockType | Color | Mode | Range | Miscellaneous Characteristics |
|-----------------|---------|---|-----------|---------------------|------|-------|---|
| Elk Mound Group | 698-703 |  | sandstone | v lt brown | M | Fn/VC | Few pink, purple and yellow quartz granules. Trace lt brown shale. |
| | 703-708 | | sandstone | brown | M | Fn/VC | Small sample size. Little dolomitic cement. Few VC pink and yellow quartz granules. HCl test. |
| | 708-713 | | sandstone | red brown | M | Fn/VC | Little hematite cement, red and grey shale. |
| | 713-718 | | sandstone | red brown | M | Fn/VC | Little hematite cement, red and grey shale. |
| | 718-723 | | sandstone | pale red brown | M | Fn/VC | Trace hematite cement, red and grey shale. |
| | 723-728 | | sandstone | dk purple brown | M | Fn/VC | Little purple brown shaly matrix. Trace silica cement. |
| | 728-733 | | sandstone | red bn & white | M | Vfn/C | Much silica cement. Sand grains are of mixed composition. Much dk red purple shale. HCl test. |
| | 733-738 | | sandstone | dk purple bn & grey | M | Vfn/C | Much shale - mostly as matrix, silica cement. Trace light-colored saprolite. |
| | 738-743 |  | shale | red brown | -- | -- | Much included silt/Vfn sand. Trace caved cemented sandstone. |
| | | | | | | | |

WGNHS Well ID 11005908

DATE 10/3/14

WELL NAME WGNHS Stevenson 2

LOCATION 1900' N of Richards Rd, 450' W of Pine Hollow Rd, Arlington, WI

**Wisconsin Geological &
Natural History Survey**

COUNTY Columbia

LOGGED BY P. Chase

LATITUDE 43.357446

LONGITUDE -89.444337

LOCATION METHOD: *GPS* ☒

AIR PHOTO/TOPO ☐ **PLS**
ELEVATION METHOD: DEM

OTHER

ELEVATION 1091

ELEVATION METHOD: *DEM*

☐ **TOPO** ☐ **OTHER** _____

DEPTH TO WATER 149.6

CASING STICK UP 1.2

File Created on: 12/9/2014

by: *AMB*

Comments:

LOGS COLLECTED:

Gamma

| | |
|---|--|
| X | |
|---|--|

Fluid Conductivity

| | |
|--|---|
| | X |
|--|---|

Unless Noted:

Caliper

| | |
|--|---|
| | X |
|--|---|

Flow Meter- HeatPulse

| | |
|--|--|
| | |
|--|--|

Single Point Resistivity

X

Flow Meter- Spinner

111

Self Potential

Normal Resistivity

| | |
|---|--|
| X | |
| | |

Optical Borehole Imager

Acoustic Borehole Imager

| | |
|---|--|
| X | |
| | |

Normal Resistivity

Fluid Temperature

| | |
|--|---|
| | |
| | X |

Acoustic Borehole Imager

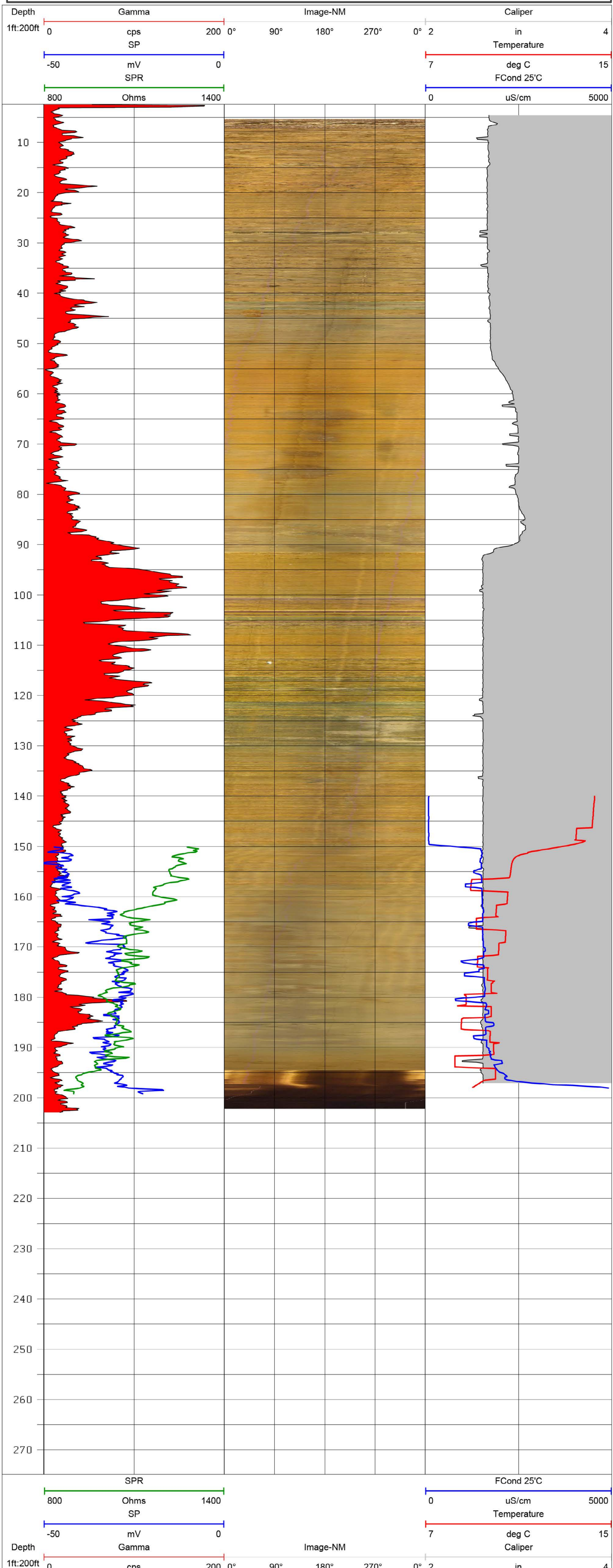
OTHER:

| | |
|--|--|
| | |
| | |

Fluid Temperature

| | |
|--|---|
| | X |
|--|---|

OTHER:

[illegible]

WGNHS Well ID 11005901

WGNHS Well ID 11000782

Wisconsin Geological & Natural History Survey

DATE 6/25/2012 WELL NAME CO-782

LOCATION *on top of a Quarry on highway 16 NW of Columbus, WI*

Wisconsin Geological & Natural History Survey

COUNTY *Columbia*

LOGGED BY *M. Gotkowitz and S Sellwood*

LATITUDE 43 deg 20' 32.44" N

LONGITUDE 89 deg 2' 58.97" W

LOCATION METHOD: GPS ☐ AIR PHOTO/TOPO ☐ PLSS ☐ OTHER ☐

ELEVATION 880 ELEVATION METHOD: DEM ☐ TOPO ☒ OTHER +/- 5 feet

WELL DEPTH 258 **CASING DEPTH** None **DEPTH TO WATER** 28

CASING STICK UP 1.4

File Created on: 4/26/2013 **by:** HSD

Comments: *Field Measured Depth to water = 25.4'. Corehole was drilled for bedrock mapping project, the core is available*

LOGS COLLECTED:

| | |
|-------|-----|
| Gamma | X |
|-------|-----|

Fluid Conductivity

Unless Noted:

Caliper

Flow Meter- HeatPulse

- all depths are in feet

Single Point Resistivity ☐

Flow Meter- Spinner ☐ X

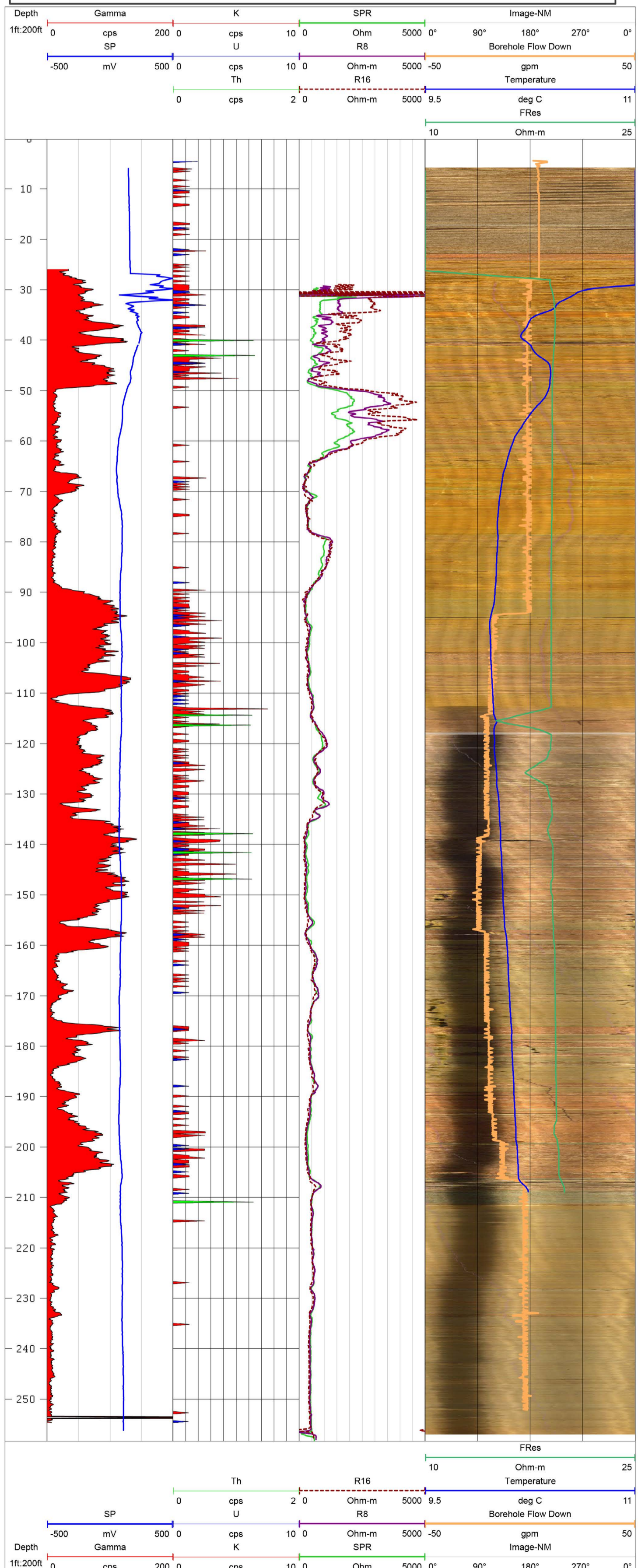
- well depth, casing depth and depth to water are interpreted from geophysical log

Self Potential ☐Optical Borehole Imager ☐

- datum is the top of casing

Normal Resistivity ☐ X

Acoustic Borehole Imager

Fluid Temperature OTHER: Spectral Gamma ☒ X

Title: Geologic Log

Site Name: WG&NHS Manke Farm Test Hole

County: COLUMBIA

Completed:

Field Check: WG&NHS-Pete Chase

Owner: WG&NHS

Address:

Driller(s): Webster & Sons Drilling, Inc.

Engineer:

Elevation: 940 ±5'

Well Use: stratigraphy

Static Level:

Location: SE, SE, NW, SW,
Sec. 35, T10N, R12E

Topo Name: Columbus

Sample Nos.: AR87

Perm No.:

WI-Unique ID#:

Pump Test:

Samples Rec'd:

Studied By:

Lauren L. Lande 0' to 847'

Roger M. Peters 0' to 847'

| Drill Hole Dimensions | | | Drilling Method | | |
|-----------------------|------|----|-----------------|------|----|
| Diameter | From | To | Method | From | To |
| | | | | | |

Grout

| Kind | From | To |
|------|------|----|
| | | |

Open Interval Characteristics

| Diameter | From | To | Opening Type |
|----------|------|----|--------------|
| | | | |

Casing & Liner Information

| Diameter | From | To | Casing | Weight |
|----------|------|----|--------|--------|
| | | | | |

Types of records available for this site
(* indicates indexing term):

- *geophysical log(s) exist, Formation log, Geologic log,
- *subsurface boring (non-core) site, Drill cuttings available

Formations:

Horicon Member, Platteville Formation, Tonti Member,
Readstown Member, Prairie du Chien Group, Jordan
Formation, Black Earth Member, Tunnel City Group, Elk
Mound Group, Precambrian

Log Comments:

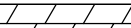
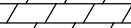
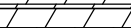
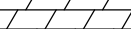
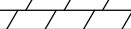
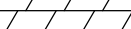
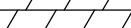
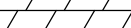
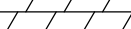
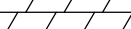
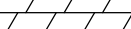
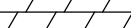
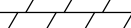
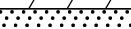
















This set of samples matches the Columbus Dry Milk Co. well (CO-47) quite well.
The "b" description is by RMP on 10/23/2012.
Located "ten feet east of old concrete foundations".

This geologic log has undergone basic review. Some information may need to be added or further reviewed. If essential information is missing or incorrect, please contact the WG&NHS Subsurface Lab at (608)-263-4004 or FAX (608)-262-8086.

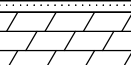



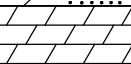

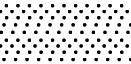
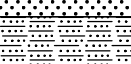
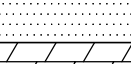

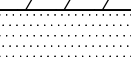
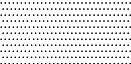
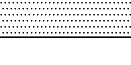
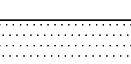
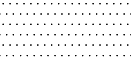
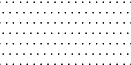


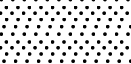

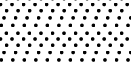



Version tracking:

10/23/2012 Initial digital version - RMP
2/4/2013 Updated digital version - LLL

Site Name: WG&NHS Manke Farm Test Hole**Title: Geologic Log**

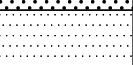
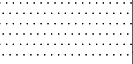
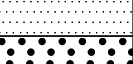


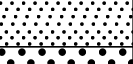
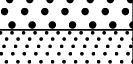

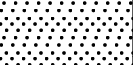
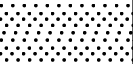

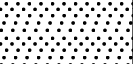
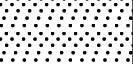
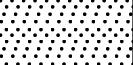

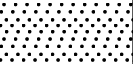
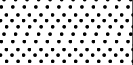

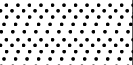
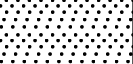
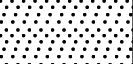
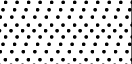



| | Depths | Graphic | RockType | Color | Mode | Range | Miscellaneous Characteristics |
|---|---------|---|----------------------|-------------------------|-------|--------------|---|
| Horicon Member Platteville Formation | 0-3 | | NO SAMPLE | | | | On-site geologist reports unconsolidated material from 0-3'. |
| | 3-5 |  | dolomite | lt gray brown | Fn | Fn/M | Slightly granular. Few fossil fragments. HCl test. Sample bag marked 0-5'. |
| | 5-10 |  | dolomite | lt gray brown | Fn | Fn/M | Slightly granular. Few fossil fragments. Some crystalline dolomite. |
| | 10-15 |  | dolomite | lt gray brown | M | Fn/M | Slightly granular. Few fossil fragments. Some crystalline dolomite. |
| | 15-18 |  | dolomite | lt gray brown | M | Fn/M | Granular, slightly porous. Few fossil fragments. Trace pyrite. |
| | 18-20 |  | dolomite | light gray | M | Fn/M | Granular, slightly porous. Few fossil fragments. Trace pyrite. |
| | 20-25 |  | dolomite | light gray | M | Fn/M | Granular, slightly porous. Few fossil fragments. Trace pyrite. |
| | 25-30 |  | dolomite | light gray | M | Fn/M | Granular, slightly porous. Somewhat shaly. Few fossil fragments. |
| | 30-35 |  | dolomite | light gray | M | Fn/M | Granular, slightly porous. Few fossil fragments. Trace pyrite. |
| | 35-40 |  | dolomite | light gray | M | Fn/M | Granular, slightly porous. Few fossil fragments. Trace pyrite. |
| | 40-41 |  | dolomite | light gray | M | Fn/M | Granular, slightly porous. Few fossil fragments. |
| | 41-46 |  | dolomite | light gray | M | Fn/M | Granular, slightly porous. Few fossil fragments. Trace pyrite. |
| Tonti Member | 46-51 |  | sandstone | yellow brown | M | Vfn/VC | Very silty. Little fair dolomitic cement, very good pyrite cement. HCl test. |
| | 51-56 |  | sandstone | yellow brown | M | Vfn/VC | Very silty. Trace very good limonite cement. |
| | 56-61 |  | sandstone | yellow brown | M | Vfn/VC | Very silty. Little very good limonite cement. Trace dolomite cave-in. |
| | 61-66 |  | sandstone | yellow brown | M | Vfn/VC | Very silty. Little very good limonite cement. |
| | 66-71 |  | sandstone | yellow brown | M | Vfn/VC | Very silty. Trace very good limonite cement. |
| | 71-76 |  | sandstone | yellow brown | M | Vfn/VC | Very silty. Trace very good limonite cement, very good silica cement. |
| | 76-81 |  | sandstone | lt yellow brown | M | Vfn/VC | Little very good limonite cement. Trace very good silica cement. |
| | 81-86 |  | sandstone | lt yellow brown | M | Vfn/VC | Little very good limonite cement. Trace very good silica cement. |
| | 86-91 |  | sandstone | lt brown | M | Vfn/VC | Trace very good limonite cement. |
| | 91-96 |  | sandstone | lt brown | M | Vfn/VC | Trace very good limonite cement. |
| | 96-101 |  | sandstone | lt brown | M | Vfn/VC | Trace very good limonite cement. |
| | 101-106 |  | sandstone | lt pink brown | M | Vfn/VC | Trace good limonite cement. |
| | 106-111 |  | sandstone | lt brown | M | Vfn/VC | Trace good limonite cement. |
| | 111-116 |  | sandstone | lt brown | M | Vfn/VC | Trace good limonite cement, good silica cement. |
| Readstown Member Prairie du Chien Group | 116-121 |  | dolomite & sandstone | dk gray & lt brown | M & M | Fn/M & Vfn/C | Dolomite: Little lt to dk gray shale. Few fossils. Trace pyrite crystals on dolomite. Sandstone: Little silica cement. HCl test. |
| | 121-126 |  | conglomerate | red brown/white/lt gray | Gr | Gr/MP | Much chert (white to red brown). Little silica cemented and pyrite cemented sandstone. Trace gray dolomite. Grain sizes suffered during drilling. HCl test. |
| | 126-131 |  | dolomite | lt gray | M | Fn/M | Little cave-in material, massive granular quartz with trace pyrite. Trace Vfn glauconite, red hematite cemented sandstone. |
| | 131-136 |  | dolomite | lt gray | M | Fn/M | Trace Vfn glauconite, pyrite. HCl test. |
| | 136-141 |  | sandstone | dk purple | Fn | Fn/M | Much gray purple shaly matrix. Very silty. Little very pale brown Vfn sandstone with much st/Vfn glauconite. Trace caved massive quartz. |

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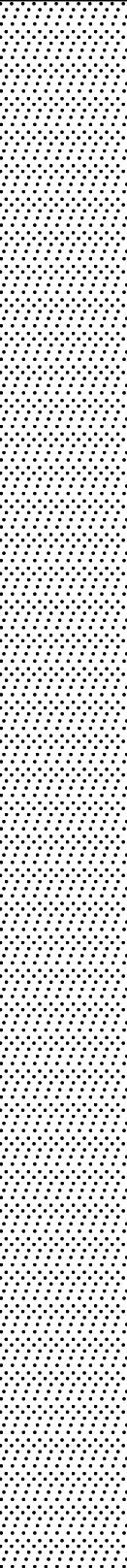
| | Depths | Graphic | RockType | Color | Mode | Range | Miscellaneous Characteristics |
|------------------------|---------|---|----------------------|-----------------------|----------|---------------|--|
| Prairie du Chien Group | 141-146 |  | dolomite | pale brown | M | Fn/M | Granular. Trace Vfn glauconite. HCl test. |
| | 146-151 |  | dolomite | pale purple brown | M | Fn/M | Granular. Little ground white silica. Trace white chert. |
| | 151-156 |  | dolomite | pale brown | M | Fn/M | Granular. Trace limonite after marcasite, oolites, white chert. Much pale yellow brown fine-grained lithographic dolomite. Little floating sand. |
| | 156-161 |  | dolomite & sandstone | gray brown & lt brown | M & M | Fn/M & Fn/VC | Trace Vfn glauconite. |
| | 161-166 |  | dolomite & sandstone | gray brown & lt brown | M & M | Fn/M & Fn/VC | Few oolites, floating sand grains. Trace Vfn glauconite, gray green shale. |
| | 166-171 |  | dolomite | lt brown & purple | M | Fn/M | Mottled. Many oolites. Trace white chert. |
| Jordan Formation | 171-176 |  | sandstone | pale brown | C | Fn/VC | Much very good dolomite cement. Little sandy dolomite. Trace lt gray green shale. |
| | 176-181 |  | sandstone | lt brown | M | Fn/VC | Much good dolomite cement. Trace white chert. Few oolites. HCl test. |
| | 181-186 |  | sandstone | lt brown | M | Fn/VC | Much good dolomite cement. Trace white chert, sandy dolomite. Few oolites. |
| | 186-191 |  | siltstone | pale brown | -- | -- | Much dolomite cement, Fn/C floating sand. Trace blue green shale. |
| | 191-196 |  | sandstone | brown purple | Fn | Vfn/VC | Much dolomite cement. Little dk purple shaly matrix and shale. Coarser sand grains are uncemented. |
| | 196-201 |  | sandstone | brown purple | Fn | Vfn/M | Much dolomite cement. Little dk purple shaly matrix and shale. Much Fn grained glauconite. Trace lt gray shale. Looks like Tunnel City. |
| Black Earth Member | 201-206 |  | dolomite | light gray | M | Fn/M | Clean dolomite. Slightly vuggy. Trace Fn grained glauconite. |
| | 206-211 |  | dolomite | light gray | M | Fn/M | Clean dolomite. Slightly vuggy. Trace Fn grained glauconite. |
| Tunnel City Group | 211-216 |  | sandstone | light brown & purple | Fn | Vfn/Fn | Mottled. Much very good dolomite cement. Little Fn grained glauconite, glauconitic dolomite. Little dk purple shaly matrix and shale. |
| | 216-221 |  | sandstone | dark purple | Vfn | Vfn/Fn | Mottled. Much good dolomite cement. Little Fn grained glauconite. Little dk purple shaly matrix and shale. |
| | 221-226 |  | sandstone | dark purple | Vfn | Vfn/Fn | Somewhat mottled. Much good dolomite cement. Little Fn grained glauconite. Little dk purple shaly matrix and shale. |
| | 226-231 |  | dolomite & sandstone | dk purple & gray | Fn & Vfn | Fn/M & Vfn/Fn | Somewhat mottled. Much good dolomite cement (sandstone). Little Fn grained glauconite. Trace green shale associated with dolomite. |
| | 231-236 |  | sandstone | dark purple | Fn | Vfn/Fn | Mottled. Much good dolomite cement. Little Fn grained glauconite. Little dk purple shaly matrix and shale. |
| | 236-241 |  | sandstone | dark purple | Fn | Vfn/M | Mottled. Much very good dolomite cement. Little Fn grained glauconite. Little dk purple shaly matrix and shale. |
| | 241-246 |  | sandstone | dark purple | Fn | Vfn/M | Mottled. Much very good dolomite cement. Little Fn/M grained glauconite. Little dk purple shaly matrix and shale. |
| | 246-251 |  | sandstone | dark purple | Fn | Vfn/M | Somewhat mottled. Much very good dolomite cement. Little Fn/M grained glauconite, dk purple shaly matrix and shale. |
| | 251-256 |  | sandstone | dark purple | Fn | Vfn/M | Somewhat mottled. Much very good dolomite cement. Little Fn/M grained glauconite, dk purple shaly matrix and shale. Trace gray green shale. |
| | 256-261 |  | sandstone | dk purple brown | M | Vfn/C | Much good dolomite cement. Coarser grains are free. Trace Fn/M grained glauconite. Little dk purple shaly matrix and shale. |
| | 261-266 |  | sandstone | dk purple brown | M | Vfn/C | Much good dolomite cement. Coarser grains are free. Trace Fn/M grained glauconite. Little dk purple shaly matrix and shale. |
| | 266-271 | | sandstone | v pale pink brown | M | Fn/VC | Much very good dolomite cement. Trace Fn/M grained glauconite, dk purple shaly matrix and shale, lt green shale. HCl test. |
| | 271-276 | | sandstone | dk purple & lt brown | M | Vfn/VC | Much very good dolomite cement. Trace Fn/M grained glauconite, lt green shale. Little dk purple shaly matrix and shale. |
| | 276-281 | | sandstone | v pale pink brown | M | Fn/VC | Much very good dolomite cement. Trace Fn/M grained glauconite, lt green shale, dk purple shaly matrix and shale. |

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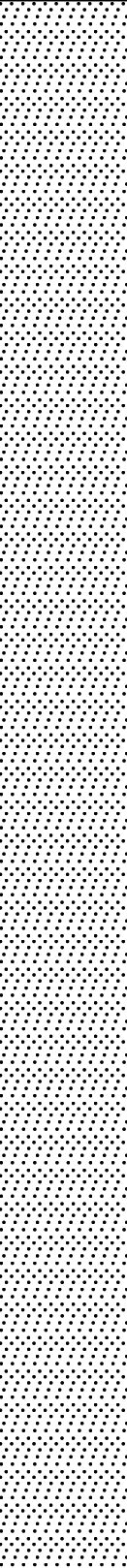
| | Depths | Graphic | RockType | Color | Mode | Range | Miscellaneous Characteristics |
|-------------------|---------|---|-----------|-------------------------|------|--------|---|
| Tunnel City Group | 281-286 |  | sandstone | dk purple & lt brown | Fn | Vfn/VC | Much very good dolomite cement. Trace Fn/M grained glauconite. Little dk purple shaly matrix and shale, lt green shale. |
| | 286-291 |  | sandstone | dk purple & lt brown | Fn | Vfn/M | Mottled. Much very good dolomite cement. Little dk purple shaly matrix and shale, lt green shale. |
| | 291-296 |  | sandstone | brown purple & lt green | Fn | Vfn/M | Mottled. Much very good dolomite cement. Little dk purple shaly matrix and shale, lt green shale. |
| | 296-301 |  | sandstone | pale red brown | C | Vfn/VC | Trace good dolomite cement (limy). Little pale green shale. Trace dk purple shaly matrix and shale, M/C grained glauconite. HCl test. |
| Elk Mound Group | 301-306 |  | sandstone | pale red brown | C | Fn/VC | Trace good silica cement. HCl test. |
| | 306-311 |  | sandstone | pale red brown | M | Fn/VC | Little good silica cement. Trace lt gray shale. |
| | 311-316 |  | sandstone | v lt brown | M | Fn/VC | Trace dk purple shale, silica cement. |
| | 316-321 |  | sandstone | v lt brown | C | Fn/VC | Trace dk purple shale, silica cement. |
| | 321-326 |  | sandstone | v lt pink brown | M | Fn/VC | Very clean sandstone. Trace hematite cement. Samples from 321-805 very poorly cemented. |
| | 326-331 |  | sandstone | v lt brown | M | Fn/VC | Trace hematite cement. |
| | 331-336 |  | sandstone | v lt brown | M | Fn/VC | Trace hematite cement. |
| | 336-341 |  | sandstone | v lt brown | M | Fn/VC | Trace hematite cement. |
| | 341-346 |  | sandstone | v lt brown | M | Fn/VC | Trace hematite cement. |
| | 346-351 |  | sandstone | v lt brown | M | Fn/VC | Trace hematite cement. |
| | 351-356 |  | sandstone | v lt brown | M | Fn/VC | Trace hematite cement. |
| | 356-361 |  | sandstone | v lt brown | M | Fn/VC | -- |
| | 361-366 |  | sandstone | v lt brown | M | Fn/VC | Trace hematite cement. |
| | 366-371 |  | sandstone | v lt brown | M | Fn/VC | Trace hematite cement, lt gray shale. |
| | 371-376 |  | sandstone | v lt brown | M | Fn/VC | Trace hematite cement. |
| | 376-381 |  | sandstone | v lt brown | M | Fn/VC | Trace hematite cement. |
| | 381-386 |  | sandstone | v lt brown | M | Fn/VC | -- |
| | 386-391 |  | sandstone | v lt brown | M | Fn/VC | Trace hematite cement, silica cement. |
| | 391-396 |  | sandstone | v lt brown | M | Fn/VC | Trace hematite cement, lt green shale. |
| | 396-401 |  | sandstone | v lt brown | M | Fn/VC | Trace hematite cement. |
| | 401-406 |  | sandstone | v lt brown | M | Fn/VC | Trace hematite cement. |
| | 406-411 | | sandstone | v lt brown | M | Fn/VC | -- |
| | 411-416 | | sandstone | v lt brown | M | Fn/VC | -- |
| | 416-421 | | sandstone | v lt brown | M | Fn/VC | Trace hematite cement. |

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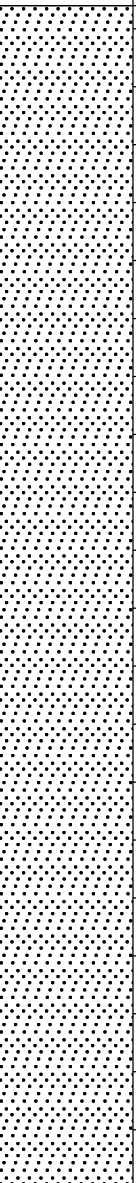
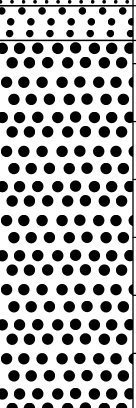

| | Depths | Graphic | RockType | Color | Mode | Range | Miscellaneous Characteristics |
|-----------------------|---------|--|-----------|------------|------|-------|--|
| Elk Mound Group | 421-426 |  | sandstone | v lt brown | M | Fn/VC | Trace hematite cement. |
| | 426-431 | | sandstone | v lt brown | M | Fn/VC | Trace limonite cement. |
| | 431-436 | | sandstone | v lt brown | M | Fn/VC | Trace hematite cement, limonite cement. |
| | 436-441 | | sandstone | v lt brown | M | Fn/VC | Trace limonite cement. |
| | 441-446 | | sandstone | v lt brown | M | Fn/VC | Trace limonite cement, silica cement. |
| | 446-451 | | sandstone | v lt brown | M | Fn/VC | Trace limonite cement. |
| | 451-456 | | sandstone | v lt brown | M | Fn/VC | Trace limonite cement. |
| | 456-461 | | sandstone | v lt brown | M | Fn/VC | Trace limonite cement. |
| | 461-466 | | sandstone | v lt brown | M | Fn/VC | Trace limonite cement, lt green shale. |
| | 466-471 | | sandstone | v lt brown | M | Fn/VC | Trace limonite cement. |
| | 471-476 | | sandstone | v lt brown | M | Fn/VC | Trace silica cement. |
| | 476-481 | | sandstone | v lt brown | M | Fn/VC | Trace good silica cement, lt green shale. |
| | 481-486 | | sandstone | v lt brown | M | Fn/VC | Trace good silica cement, limonite cement. |
| | 486-491 | | sandstone | v lt brown | M | Fn/VC | Trace good silica cement. |
| | 491-496 | | sandstone | v lt brown | M | Fn/VC | Trace good silica cement. |
| | 496-501 | | sandstone | v lt brown | M | Fn/VC | Trace good silica cement. |
| | 501-506 | | sandstone | v lt brown | M | Fn/VC | Trace good silica cement. |
| | 506-511 | | sandstone | v lt brown | M | Fn/VC | Trace good silica cement. |
| | 511-516 | | sandstone | v lt brown | M | Fn/VC | Trace good silica cement. |
| | 516-521 | | sandstone | v lt brown | M | Fn/VC | Trace good silica cement. |
| | 521-526 | | sandstone | v lt brown | M | Fn/VC | Trace limonite cement. |
| | 526-531 | | sandstone | v lt brown | M | Fn/VC | Trace good silica cement. |
| | 531-536 | | sandstone | v lt brown | M | Fn/VC | Trace good silica cement. |
| | 536-541 | | sandstone | v lt brown | M | Fn/VC | Trace good silica cement. |
| | 541-546 | | sandstone | v lt brown | M | Fn/VC | Trace good silica cement, lt gray shale. |
| | 546-551 | | sandstone | v lt brown | M | Fn/VC | Trace good silica cement. |
| | 551-556 | | sandstone | v lt brown | M | Fn/VC | Trace good silica cement. |
| | 556-561 | | sandstone | v lt brown | M | Fn/VC | Trace good silica cement. |

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| | Depths | Graphic | RockType | Color | Mode | Range | Miscellaneous Characteristics |
|-----------------------|---------|--|-----------|------------|------|-------|---|
| Elk Mound Group | 561-566 |  | sandstone | v lt brown | M | Fn/VC | Trace good silica cement. |
| | 566-571 | | sandstone | v lt brown | M | Fn/VC | Trace good silica cement. |
| | 571-576 | | sandstone | v lt brown | M | Fn/VC | Trace good silica cement. |
| | 576-581 | | sandstone | v lt brown | M | Fn/VC | Trace good silica cement. |
| | 581-586 | | sandstone | v lt brown | M | Fn/VC | Trace good silica cement. |
| | 586-591 | | sandstone | v lt brown | M | Fn/VC | Trace good silica cement. |
| | 591-596 | | sandstone | v lt brown | M | Fn/VC | Trace good silica cement, lt green shale. |
| | 596-601 | | sandstone | v lt brown | M | Fn/VC | Trace good silica cement, lt green shale. |
| | 601-607 | | sandstone | v lt brown | M | Fn/VC | Trace good silica cement, lt green shale, st/Vfn glauconite in shale. |
| | 607-612 | | sandstone | v lt brown | M | Fn/VC | Trace good silica cement. |
| | 612-617 | | sandstone | v lt brown | M | Fn/VC | Trace good silica cement. |
| | 617-622 | | sandstone | v lt brown | M | Fn/VC | Trace good silica cement, pyrite cement. |
| | 622-627 | | sandstone | v lt brown | M | Fn/VC | Trace good silica cement, pyrite cement. |
| | 627-632 | | sandstone | v lt brown | M | Fn/VC | Trace good silica cement. |
| | 632-637 | | sandstone | v lt brown | M | Fn/VC | Trace good silica cement. |
| | 637-642 | | sandstone | v lt brown | M | Fn/VC | Trace good silica cement, pyrite cement. |
| | 642-647 | | sandstone | v lt brown | M | Fn/VC | Trace good silica cement. |
| | 647-652 | | sandstone | v lt brown | M | Fn/VC | Trace good silica cement, pyrite cement. |
| | 652-657 | | sandstone | v lt brown | M | Fn/VC | Trace pyrite cement. |
| | 657-662 | | sandstone | v lt brown | M | Fn/VC | Trace good silica cement, pyrite cement. |
| | 662-667 | | sandstone | v lt brown | M | Fn/VC | Trace good silica cement, pyrite cement. |
| | 667-672 | | sandstone | v lt brown | M | Fn/VC | Trace good silica cement, pyrite cement. |
| | 672-677 | | sandstone | v lt brown | M | Fn/VC | Trace good silica cement. |
| | 677-682 | | sandstone | v lt brown | M | Fn/VC | Trace good silica cement. |
| | 682-687 | | sandstone | v lt brown | M | Fn/VC | Trace good silica cement. |
| | 687-692 | | sandstone | v lt brown | M | Fn/VC | Trace good silica cement, pyrite cement. |
| | 692-697 | | sandstone | v lt brown | M | Fn/VC | Trace silica cement, pyrite cement. |
| | 697-702 | | sandstone | v lt brown | M | Fn/VC | Trace silica cement, pyrite cement. |

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| | Depths | Graphic | RockType | Color | Mode | Range | Miscellaneous Characteristics |
|-----------------------|---------|---|-----------|-----------------------|------|--------|--|
| Elk Mound Group | 697-702 |  | sandstone | v lt brown | M | Fn/VC | Trace silica cement, pyrite cement. |
| | 702-707 | | sandstone | v lt brown | M | Fn/VC | Trace silica cement. |
| | 707-712 | | sandstone | v lt brown | M | Fn/VC | Trace silica cement. |
| | 712-717 | | sandstone | v lt brown | M | Fn/VC | Trace silica cement. |
| | 717-722 | | sandstone | v lt brown | M | Fn/VC | -- |
| | 722-727 | | sandstone | v lt brown | M | Fn/VC | Trace silica cement. |
| | 727-732 | | sandstone | v lt brown | M | Fn/VC | Trace silica cement. |
| | 732-737 | | sandstone | v lt brown | M | Fn/VC | Trace silica cement. |
| | 737-742 | | sandstone | v lt brown | M | Fn/VC | Trace silica cement. |
| | 742-747 | | sandstone | v lt brown | M | Fn/VC | Trace silica cement, pyrite cement. |
| | 747-752 | | sandstone | v lt brown | M | Fn/VC | Trace silica cement. |
| | 752-757 | | sandstone | v lt brown | M | Fn/VC | Trace silica cement. |
| | 757-762 | | sandstone | v lt brown | M | Fn/VC | Trace silica cement. |
| | 762-767 | | sandstone | v lt brown | M | Fn/VC | Trace silica cement, lt green shale. |
| | 767-772 | | sandstone | v lt brown | M | Fn/VC | Trace silica cement. |
| | 772-777 | | sandstone | v lt brown | M | Fn/VC | Trace silica cement, pyrite cement. |
| | 777-782 | | sandstone | v lt brown | M | Fn/VC | Trace silica cement. |
| | 782-787 | | sandstone | v lt brown | M | Fn/VC | -- |
| | 787-792 | | sandstone | v lt brown | M | Fn/VC | Little silica cement. Only Fn grains cemented. |
| | 792-797 | | sandstone | v lt brown | M | Fn/VC | Little silica cement. Only Fn grains cemented. Trace lt gray shale. |
| | 797-802 | | sandstone | v lt brown | M | Vfn/VC | Much very good silica cement. Trace pyrite cement. |
| Precambrian | 802-805 |  | sandstone | v lt gray brown | C | Vfn/VC | Little very good silica cement, pyrite cement. |
| | 805-807 | | sandstone | v lt gray brown | VC | Vfn/VC | "Partial hole collapse overnight." Much gray green shale. Many quartz granules. Trace St/Vfn glauconite in shale. |
| | 807-812 | | sandstone | v lt gray brown | VC | Vfn/VC | Many quartz granules. Trace pyrite cement. |
| | 812-817 | | sandstone | pale brown | VC | Vfn/VC | Few quartz granules. Trace pyrite cement. |
| | 817-822 | | sandstone | pale brown | VC | Vfn/VC | Few quartz granules. Trace pyrite cement. Little ground white silica. |
| | 822-827 | | sandstone | pale brown | VC | Vfn/VC | Few quartz granules. Trace pyrite cement. Little ground white silica. |
| | 827-832 | | sandstone | lt red and pale brown | VC | Vfn/VC | A granite wash. Many granules (mostly quartz). One 4mm quartz small pebble. Some weathering and rounding. Trace pyrite cement (specks on quartz grains). |
| | 832-837 | | sandstone | lt red and pale brown | VC | Vfn/VC | A granite wash. Many granules (mostly quartz). One 4mm quartz small pebble. Some weathering and rounding. Trace pyrite cement (specks on quartz grains), lt green shale. |
| | 837-842 |  | granite | red/black | Fn | Fn | Sample looks orange brown from much caved sand. Little ground white silica. Black mineral is biotite (9% of sample). |

Title: Geologic Log

| | Depths | Graphic | RockType | Color | Mode | Range | Miscellaneous Characteristics |
|-------------|---------|---|----------|-----------------|------|-------|---|
| Precambrian | 837-842 |  | granite | red/black | Fn | Fn | |
| | 842-847 |  | granite | brown red/black | Fn | Fn | Sample looks brown from much caved sand. Little ground white silica. Black mineral is biotite (9% of sample). |
| | | | | | | | |

WGNHS Well ID 13001466



Wisconsin Geological & Natural History Survey

DATE 4/2012

WELL NAME NS-2

LOCATION Nine Springs

Wisconsin Geological & Natural History Survey

COUNTY Dane

LOGGED BY D. Hart

LATITUDE 43.03639

LONGITUDE -89.35967

LOCATION METHOD: GPS [X] AIR PHOTO/TOPO [] PLSS [] OTHER []

ELEVATION 863 ELEVATION METHOD: DEM [X] TOPO [] OTHER []

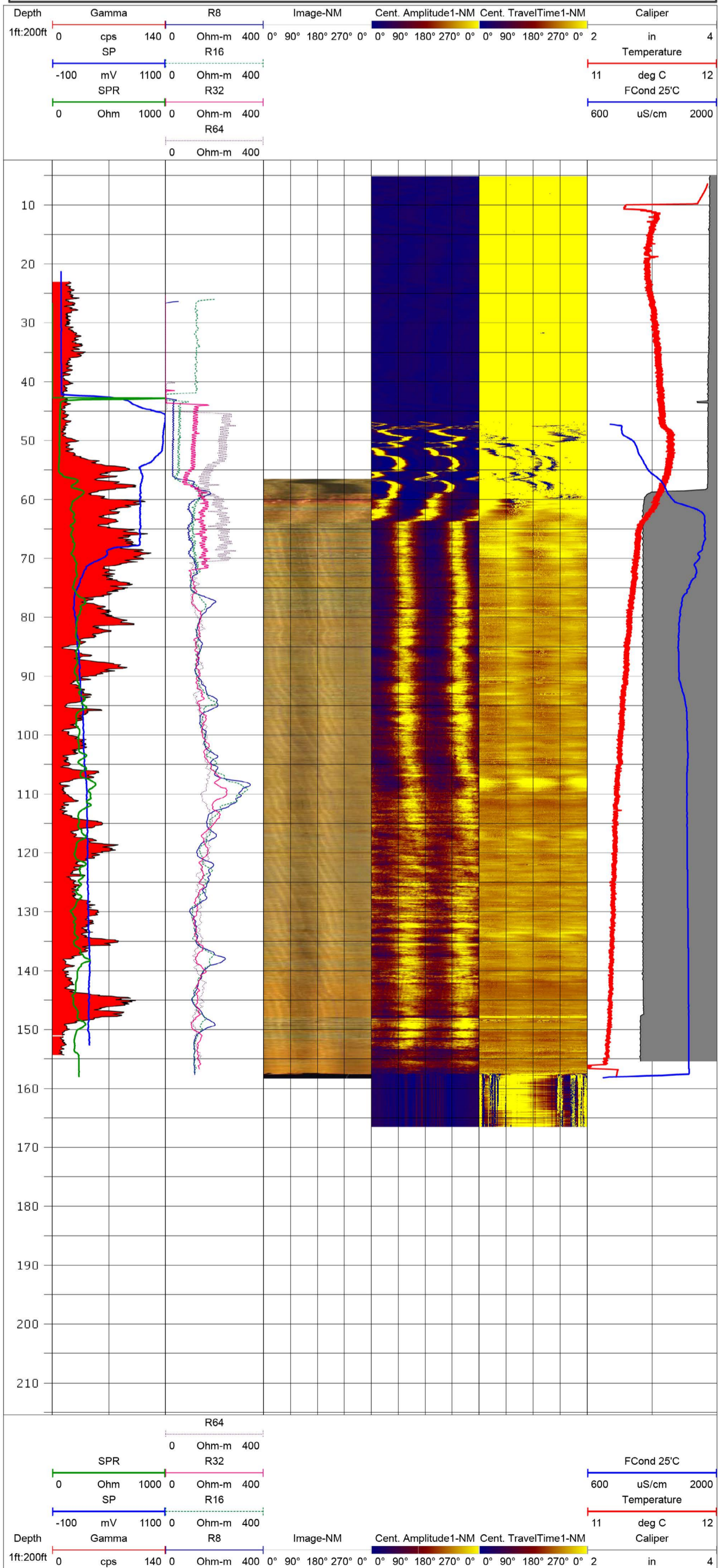
WELL DEPTH 158 CASING DEPTH 58 DEPTH TO WATER 47

CASING STICK UP 2 File Created on: 2/4/2014 by: AMB

Comments:

LOGS COLLECTED:

| | | | | |
|--------------------------|-------------------------------------|--------------------------|-------------------------------------|---|
| Gamma | <input checked="" type="checkbox"/> | Fluid Conductivity | <input checked="" type="checkbox"/> | Unless Noted: - all depths are in feet - well depth, casing depth and depth to water are interpreted from geophysical log - datum is the top of casing |
| Caliper | <input checked="" type="checkbox"/> | Flow Meter- HeatPulse | <input type="checkbox"/> | |
| Single Point Resistivity | <input type="checkbox"/> | Flow Meter- Spinner | <input type="checkbox"/> | |
| Self Potential | <input type="checkbox"/> | Optical Borehole Imager | <input checked="" type="checkbox"/> | |
| Normal Resistivity | <input checked="" type="checkbox"/> | Acoustic Borehole Imager | <input checked="" type="checkbox"/> | |
| Fluid Temperature | <input checked="" type="checkbox"/> | OTHER: | <input type="checkbox"/> | |



| | | | |
|---|-------------------------------------|----------------------------------|-------------------------------------|
| WELL ID: 13001216 | | WELL NAME: Hydrite Corp MP18 | |
| DATE: 9/18/2007 | | LOCATION: NE,NE Sec. 14 T7N R11E | |
| County: Dane | | Elevation: 912.28 ft | |
| Well Depth (Logger): 475 | | Logged by: | |
| Depth to Water: | | Casing Depth: 52' | Casing Stick-up: |
| Comment: Cottage Grove, Wi, Fluid Temperature, Conductivity, and Resistivity logs range from 0 to 20'ft | | | |
| LOGS COLLECTED: | | | |
| Gamma | <input checked="" type="checkbox"/> | Fluid Conductivity | <input checked="" type="checkbox"/> |
| Caliper | <input type="checkbox"/> | Flow Meter- HeatPulse | <input type="checkbox"/> |
| Single Point Resistivity | <input checked="" type="checkbox"/> | Flow Meter- Spinner | <input type="checkbox"/> |
| Self Potential | <input checked="" type="checkbox"/> | Optical Borehole Imager | <input type="checkbox"/> |
| Normal Resistivity | <input checked="" type="checkbox"/> | Acoustic Borehole Imager | <input type="checkbox"/> |
| Fluid Temperature | <input checked="" type="checkbox"/> | OTHER: Fl. Resistivity, Video | <input checked="" type="checkbox"/> |

