Oct. 4-51 GA Norgaard

Fort Dodge, Webster Co.

City Wells

Wells #9 and #12 shut off at 8:45 A.M. (All wells now off).

Press. in Well #8 before wells were shut off (1.0)

Recovery in Well #8

measured by pressure gauge.

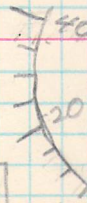
City Well #8

Time	Pressure	Water Level	Remarks
8:45	2.5	-ft	
8:45:30 AM	2.5		
46	2.5		
46:30	2.5		Head above corp cock, 7.65' below pump house floor
47	2.5		
47:30	2.7		
48	2.7		
48:30	3.0		
49	3.25		
49:30	3.50		
50	4.0		
50:30	4.0		
51	4.0		
51:30	4.0		
52	4.0		
52:30	4.0		
53	4.0-		
53:30	4.0-		
54	4.0-		
54:30	4.0-		
55	4.0-		
55:30	4.0-		
56	4.0-		
56:30	4.0-		

Fort Dodge, Webster Co. GN.

City Well #8

Time	Pressure	Water Level
8:57 AM	4.0-	
57:30	4.0	
58	4.0	
58:30	4.0-	
59	4.0-	
59:30	4.0-	
9:00	4.0	
9:03		
9:07:30	4.0	
9:09	4.0+	
9:10	4.0+	
9:12	4.0+	
9:15	4.0+	
9:17	4.0+	
9:25		
9:34	5.0-	
9:37	5.0	
9:43		
9:48		
9:52	5.0	
10:00 AM ↓	4.1	
10:11	4.2	
10:14	4.21	
10:15	4.21	
10:15:30	4.04	
10:16	3.93	
10:17	3.88	
10:17:30	3.82	
10:18	3.78	
10:19	3.75	
10:20	3.73	
10:21	3.72	
10:22	3.72	
10:24	3.70	
10:25	3.68	
10:27	3.65	



This interval taken as 5 in all readings on well #8

→ Check well #14, no flow.

→ #14 about .5' down in pipe

Well #9 = 61
Well #12 = 70

Water Level in 4" pipe Well #15 on

7.65' from corp. cock to pump house floor.

Fort Dodge
City #8 Well

Time	Water Level	Remarks
10 30 AM	3.62	
10 32	3.60	
10 35	3.57	
10 40	3.55	
10 45	3.53	
10 50	3.51	
10 55	3.49	
11 10	3.48	
11 15	3.48	
11 30	3.48	
11 55	3.45	
1 45 PM	3.52	
3 10	3.58	
6 09	3.80	

R-1-B

THORPE BROTHERS WELL COMPANY

2340 Sixth Avenue

DES MOINES, IOWA

W-0009

Drilled for City of Ft. Dodge *at* Ft. Dodge, Ia

Drilling started _____ *19* ____ *Completed* _____ *19* ____

Well No. 8 *Kind of Well* _____ *Depth* 1432' *Size hole started* _____ *in.*

Finish _____ *G. P. M.* _____ *Static head* _____ *Drawdown* _____

Water was first encountered at _____ *in* _____ *Approximate Amount* _____

Remarks _____

RECORD OF PERMANENT PIPE					TEMPORARY PIPE	
SIZE PIPE	AMOUNT OF PIPE	DEPTH TO BOTTOM OF PIPE	DEPTH TO TOP OF PIPE	MAKE OF PIPE	SIZE PIPE	AMOUNT
16"	190'	190'	Surface			
12"	235'	235'	"			
8"	618' 3"		1040 ?	Liner		

Driller _____ *From Surface to* _____ *feet*

Driller _____ *From* _____ *feet to* _____ *feet*

Driller _____ *From* _____ *feet to* _____ *feet*

R-1-B

THORPE WELL COMPANY

2340 SIXTH AVENUE

DES MOINES, IOWA

Drilled for City of Ft. Dodge *at* Ft. Dodge, Ia

Well is located _____ *miles N-E-S-W and* _____ *miles N-E-S-W from* _____

in the _____ ¼ _____ ¼ *Section* _____ *Township* _____ *Range* _____

Drilling started _____ *19*____ *Completed* 7/29/1923 *19*____

Well No. 8 *Kind of Well* _____ *Depth* 1432 *Size hole started* _____ *in.*

Finish _____ *G. P. M.* Flow *Static head* _____ *Drawdown* _____

Water was first encountered at _____ *in* _____ *Approx. Amt.* _____ *Temp.* _____

Remarks _____

RECORD OF PERMANENT PIPE					TEMPORARY PIPE	
SIZE PIPE	AMOUNT OF PIPE	DEPTH TO BOTTOM OF PIPE	DEPTH TO TOP OF PIPE	MAKE OF PIPE	SIZE PIPE	AMOUNT
16"		190'	Surface			
12"		235'	Surface			
8"	422'	618'	1040'			

Driller _____ *From Surface to* _____ *feet*

Driller _____ *From* _____ *feet to* _____ *feet*

Driller _____ *From* _____ *feet to* _____ *feet*

AMOUNT IN FEET	KIND OF SOIL OR FORMATION (BE SPECIFIC)	TOTAL DEPTH FEET
200	Drift & varigated shales	200
78	Limestone	278
7	Shale	285
195	Limestone	480
12	Shale	492
190	Limestone	682
8	Shale	690
198	Limestone	888
7	Shale	895
193	Limestone	1088
3	Shale	1091
149	Limestone	1240
10	Sandrock- soft	1250
130	Limerock	1380
18	Shale- soft & cavey	1398
2	Limestone	1400
32	Sandrock(bottom very soft)	1432
	Sand ran in at bottom- hard to control	

Curb - 978.65'

City #8

Name of Well Fort Dodge, Wood 9 Sheet No. 1

Depth Range 0 - 100 Scale: 1 inch=10 feet.

0

No Sample

10

20

5 40 53 / 4 87

30

40

Limestone, grey to cream, rather dense, 80-90%; Shale, calcareous, green to grey, 10-20

53

Miss (487')

60

No Sample

280 53 227

70

80

90

100

City #8

Name of Well Fort Dodge Wooog Sheet No. 2

Depth Range 100 - 200 Scale: 1 inch=10 feet.

100

No sample

10

No Sample

20

No Sample

30

No Sample

40

Shale, dark grey to nearly black, Calcareous, nearly 100%; contains large amount of pyrite.

50

Shale, red to purple, mottled with light grey, Calcareous, nearly 100%; Pyrite abundant.

Miss. Ste. Genv.

60

Study accessory minerals

Shale, red to purple, similar to 150-160; nearly 100%; some small pieces of coal, may have been put in by driller; Barite ± 1%. Feldspar probably from above

70

Shale, similar to that in 150-160; 80-90%; Limestone, nearly white, 1-10%;

180' 1st Miss.

80

Limestone light grey, soft, 70-80%; Shale, 20-30%; Pyrite < 1%.

90

Limestone, light grey, slightly iron stained, 80-90%; Gypsum ± 10%; Pyrite, ± 1%; Qtz, in minute xls, 1%

200

city #8

Name of Well Fort Dodge Wooog Sheet No. 3

Depth Range 200 - 300 Scale: 1 inch=10 feet.

200

✓ Limestone, grey, rather soft, 80-90%
Quartz, m clear, fresh xls (Geodes?) 10-20%, some xls are complete; sand, C, 1-½, 1-5%
Shale, red, 1-5%, Frag. of fossils numerous, -

10

✓ Limestone, grey, similar to 200-210, 70-80%; Shale grey calcareous, 10-20%; Pyrite ± 1%; Qtz. sand, a, ½-¼) 5-10% (Geodes & cherty zones)

? upp Miss

20

Kind

Limestone (rust-colored, mod iron oxide included) 80-90%, Qtz, fresh angular, 1-5%; Pyrite ± 1%, Residual qtz, probably ± 1% (cream to brn med-coarse xline) (Flfs - Spirifer remnoid)

30

Limestone, grey to buff, very finely crystalline, 90-95%; Qtz, fresh angular pieces, 1-5%; Pyrite ± 1%

40

Limestone, grey to buff, iron stained, finely crystalline, 85-95%, sand, a, ½-¼, 1-5%; Pyrite ± 1%

Miss.

50

Limestone grey to light cream, oolitic possibly some clastic material as particles are C. + not typically oolites, 90-95%; Chert, 1-3%; Pyrite < 1%.

60

Limestone, similar to that in 250-260, 85-95%; Qtz, fresh xls, 1-10%

70

Shale, light grey, (to gry-grn) about 1% showing iron stain, (non calcareous) 70-80%; Limestone fragments, 10-20%; Pyrite, 1-5% (Study accessory Minerals)

Type

80

Kind @280'

LS, 95-100±%; lt. milk-gry; fine xline, dense; drills into small cleav. frags and shows abund. oolitic (possibly some Osagea) structure; flfs (crinoid stems); some clear calcite in cleavage fragments -; Rock is apparently very compact and drills to powdery form.

SJO 280, 260

90

LS, 95% ±; milk-gry to very lt. tan (latter due to rust spots from decomp of pyrite and casing scale); med to fine euhedr. and cleav. text; porosity low; Osagea and oolitic structure very common and prominent, slightly coarser than zone above.

300

City #8

Name of Well: Fort Dodge Well 9 Sheet No. 4

Depth Range: 300 - 400 Scale: 1 inch = 10 feet.

300

LS, 95-100%; lt gry to ylw-gry (latter due to iron rust stain etc) med-euhed, compact text.; Osagea and oolites common; pyrite common; slightly dolom.

10

See below Like 320-330

Limestone, cream to white, rather finely crystalline, nearly 100% chert, white ± 10%, Qtz, fresh xls, < 1%

20

Dolomite 90-95%; lt tan to bf; med. euhedral porous text; excellent rhombic forms dolo; drills like sand; < 5% very fine saccha. dry-wh ls.

(one large lt. tan frag. of dolo. shows crinoid frags. and fine congl. of Osagea in oolitic shaped and disc. grains — probably caved from above = see zones ± 290-310 ±)

30

LS, dolomitic, cream to light grey, hard, dense, ± 100%. Pyrite < 1% Similar to 340-50' Some zones of med-euhr dolo.

40

Limestone, dolomitic, cream to lt-choc; med. euhedr. porous text; about 30% compact, very fine grnd; clear calcite rhombs & xtal frags; Selenite present but rare

Miss.

Fls. molds (brachs) xls; Feldspar pink slightly altered, Probably drum dust, < 1% (Cinders used)

50

LS, dolo, 60-65%, brw to lt. choc; med euhr. porous; LS, slightly dolo: 30-35%; cream to buff; very fine compact text; clear cleav. rhombs calcite common; pyrite present.

60

LS, dolomitic, 65-70%; lt. choc. brw; med euhr. porous texture, drills to fine sand-like granules; Dolomite, siliceous, 30% ±; lt gry to tan; very fine grnd; molds of dolo xtals makes porous texture; some brown chert; pyrite rare; brach molds in dolo-ls.

70

LS, 95%; lt gry to dirty buff; fine euhr. med. porous, text; dolomitic; appar. softer than zones below. Finely powdered by drill, ± 100%; Calcite, clear fresh (cleavage rhombs) < 1%

80

LS - 95% ±; dolomitic; fine to med euhed text; med-gry-brown to buff; slightly flfs; clear calcite clear. rhombs abundant; chert rare; pyrite very rare ↑ in very fine xtals; porosity mod. = 20-25% ±, few vugs in dolo.

90

LS, very dolomitic, lt bf to gry-brw; med euhedral, text with interlocking voids, porosity 25% ± to very compact and dense.

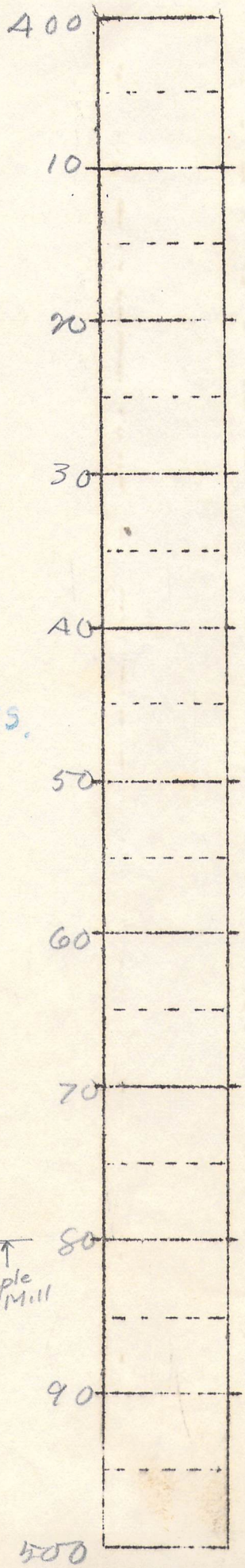
Clear calcite cleavage rhombs abund; Chert, milk wh-gry, some with fine oolitic text; 5-10%

400

city #8

Name of Well Fort Dodge, Wood 9 Sheet No. 5

Depth Range 400 - 500 Scale: 1 inch=10 feet.



Miss.

979
980
999

Maple Mill

Limestone, grey to buff, dense, nearly 100%; Calcite, pure, fresh xls, <1%

Limestone, grey to buff, dense, finely crystalline, ±100%; Qtz, clear fresh xls, ±1%,

Dolomite, brown to dark grey, dense, ±100%; Chert, brown to grey <1%; calcite, fresh xls, ±1%

Dolomite, grey to dark buff, finely crystalline, ±100%
Qtz, clear, fresh xls, <1%

Dolomite light buff to grey, dolomitic, very finely crystalline, ±100%; clear calcite <1%

Dolomite, containing some Calcite, rather soft, shaley 90-98%, grey; Qtz, in shale or silt size fragments, 1-10%.

Limestone, dark grey to buff, hard, finely crystalline 95-99%
Qtz, clear fresh xls, some perfect, 1-3%;

Limestone, light grey to cream, finely crystalline ±100%; Qtz, <1%; Clear calcite xls, <1%

Shale, blue-green, iron stained in part, slightly non-calcareous, 90-95%; Sand, C, 1/2-1/4, 1-10%; Pyrite, ±1%
Calcite, 1-10%

Shale, light grey, slightly calcareous, to non-calc. 80-85%; (Limestone, 15-20% bf to gry; med-coarse xline - thin bds in sh -) Calc nature of material from ls - Pyrite <1%

city #8

Name of Well Fort Dodge Woods Sheet No. 6

Depth Range 500 - 600 Scale: 1 inch=10 feet

500

Sh. 6' Shale & siltstone, light grey, slightly Grey ^ Lt calcareous, 90-98%; Sand, qtz, C, 1/4-1/8 1-5%; Calcite, in clear, fresh Sls-4' Grn. x ls, 1-5% grnh- calc to soapstone similar to 500-510

10

Shale, light grey ^ Sls - gry to bf, dolomitic - fine grnd. 50-60%; Limestone, 40-50%; sand, C, 1/4-1/8, 1-5%; Pyrite 1 to 2% (Euhedral pyrite very small grn + imbedded)

20

No Sample

Probably Sh, or Sls and Ls bands -

30

No Sample

Miss. (487)

40

Dev. (~~3~~ 40')

Limestone, cream to light grey, hard, dense, 90-98%; shale, grey, calcareous 1-5%

50

Limestone, cream to light grey, hard, dense, ± 100%; qtz, ± 1%; Green Shale < 1% clear Calcite x/s, to 2%

60

Limestone, Cream to grey, hard, dense, ± 100%; Green to grey Calcareous Shale 1-5%

70

Dolomite (Some with $CaCO_3$) < Cream to light grey, similar to 560-570, ± 100%; blue to grey shale, 1-5%

80

Limestone, grey, rather soft, shaley, ± 100%; ground fine by drill; Calcite, clear, fresh x/s, 1-5%

90

✓ Limestone, light cream to nearly white, pure, ± 100% (x/s quite large) Shale or silt fragments, blue to grey, 1-5%

600

city #8

Name of Well Fort Dodge Wood 9 Sheet No. 7

Depth Range 600 - 700 Scale: 1 inch=10 feet.

600

Dolomite, light grey to nearly white; pure fragments almost transparent, ± 100 %; Qtz, clear, fresh xls, ± 1%

10

Dolomite, like that in 600-610, ± 100 %; Shale or siltstone, green to grey; calcareous, 1-2 %

20

Dolomite cream to grey, very pure ± 100 %
grey-green shale ± 1%
sand, Qtz C, ¼-⅛) ± 1%
Limestone, dolom grey to light cream finely crystalline, ± 100 %, Pyrite < 1%; Qtz ± 1%

30

40

Limestone, dolom grey to cream, finely crystalline ± 100 %, clear calcite xls, 1-5 %; Qtz < 1%

Dev.

50

Limestone, dolom light grey to brown, finely crystalline, dense, ± 100 %, Qtz, clear, fresh, ± 1%; Pyrite < 1%

60

Limestone, slightly dolo light grey to cream, hard, ± 100 %; Qtz, C, ¼-⅛ < 1%; clear, fresh Calcite, 1-5 %.

70

Limestone, dolomitic grey to light cream, rather dense, ± 100 %; Qtz, clear fresh xls ± 1%; Shale, green, ± 1%
Some thin bd clear gry dolo beds - < 10% of carb rock

80

Ls
684'
Limestone, grey, impure, soft, - 50-60 %; Shale, grey, 40-50 %
Qtz, clear, fresh xls, ± 1%

90

Sh. Grn-brn
693'
Ls
Limestone, grey, impure, soft, 60-70 %; Shale, grey, 30-40 %; Shale, green, ± 1%

700

city #8

Name of Well Fort Dodge, Wagg Sheet No. 8

Depth Range 700 - 800 Scale: 1 inch=10 feet.

700

Limestone, light cream to grey, dense, finely crystalline, 80-90%; <Shale, green to grey - ~~#~~ ± 10% from above> Sand, Qtz, C. ½-¼, ±1%.

10

LS 11½' Shale, grn-thin laminated, micac. pyritic; non-calc - 75-80% - Thin gry-bf LS bands - ~~10-20%~~, Shale, grey, calcareous, 20-30% <Shale, green, 1-2% from above> Pyrite ±1%

Sh 18'

20

very dolomitic) med-coarse euhd text in gray zones;

(Limestone or dolomite ~~thin 710-720~~, impure, shaley, some, ^ have bands; 80-90%, Grade ~~Detrital~~ Qtz, <1% 10; <Shale, green, 1-3%; from above>

Pyrite ±1%

30

Dolomite, like 720-30'; lt gry; med-coarse euhr. compact text; drills to small granules, a few aggregates.

734'

Sh. gry-grn; thin laminated; micac; numerous large flat frags. Some bright grn. plastic sh in small abraded frags may be thin zones in dolo.

738'

Dolo-like 740-750, beginning at 738'

40

Dolomite and thin zones of dolo. LS; indicating varying amt. of dolomitization of rock 85-90%; lt. gry to lt. buff; fine euhd. compact text; slightly pyritic; selenite present.

Dev.

Sh, grn, micac, and in small slivers 10±%, may be from above. Sh, blk, carb. in small abraded frags. from above.(?) @ 5%

50

Dolomite 80-85%; lt bf; very fine compact text; drills in fine granular frags: Some clear calcite vein or cavity filling; some selenite — Black carb. sh common (@ 10-15%) in small abraded frag prob. from above(?) few frags. grn-brn clay-

[Note: the blk, petrol. sh is in several samples between 740 and 790 ft.; due to usual small and abraded appearance it is believed that this shale may be from a single or two thin zones between 745 and 755 and be badly worn in drilling etc.] The shale is waxy and slightly inflammable

60

Dolomite, brown to buff, soft, 80-90%; <Black shale similar to that found 750-760, @ 5% - probably cave> Qtz, fresh x/s, ±1%

70

Dolomite, cream to buff, finely crystalline, 95-98%; Shale, black as in 750-760 - @ 3% in slightly larger chips; Sand, ¼-½ C, 1-2%

80

Dolomite, cream to buff, pure, finely crystalline, 90-98%; [Shale, black, similar to that in 750-760, 1-5%;] Qtz, clear fresh x/s 1-2%

90

Dolomite, light cream, finely crystalline, ±10% [Detrital Qtz, ±1-5%]

800

city #8

Name of Well Fort Dodge Wooog Sheet No. 9

Depth Range 800-900 Scale: 1 inch=10 feet.

800

Limestone, buff to cream, finely crystalline, ± 100%, detrital Qtz, 1-5%, Clear calcite xls, 1-5%

10

Limestone, grey to buff, finely crystalline, ± 100%; Pyrite ± 1%, clear, fresh calcite, ± 1%

20

~~Dolomite~~ ~~Limestone~~ calcitic, grey to buff, dense, ± 100%; Pyrite < 1%; Black shale, probably from above, ± 1%.

30

~~Dolomite~~ ~~Limestone~~ calcitic, grey, similar to that 820-830, ± 100%; clear, fresh calcite xls, 1-3%

40

Dolomite, slightly calcitic; lt gry to bf; med to fine euhr. compact text; drills to med fine granules and small irreg. sharp chips: abundant vein and cavity calcite xtals and clear. rhombs. [BLK and grn sh frags. (very small) are rare]

Dev.

50

Blk Sh 1'±

Dolomite, brown to buff, med. to finely crystalline, 70-80%; Sh, blk, petrol; thin lamin; waxy, soft, crushs to choc. brn; appears to be in place and abrades with drilling 10%±; [Qtz, clr, 1-3%, not part of zone]

60

Dolomite, grey to buff, finely crystalline, 80-90%; Shale, green, calcareous, 10-20%; Qtz sand, C, 1/4-1/8 pvedom, 1-10%; Pyrite ± 1%

70

Dolomite, calcitic; lt. gray to lt. bf, some dark gry and carbonaceous; med fine to coarse euhr text; largely compact, but some porous with vugs; clear calcite present; vein selenite rare; eubr. imbedd. pyrite present; [Grn sh. frags. from above]. - some sh at base.

Dolo. ↓ 878'

Base of Dev. 879'

879½ ← ?SS; curv.-subrd; frosted; 1/8-1/16mm; may be thin bed or imbedded in lower dolo. zone.

Sh ↑

Top of Mag.

80

Shale; dull green; very slightly calc; micac to silty in part; thin lamin. drill frags in chips; some choc. brn organic material or very fine flaky phosphatic scales; @ 5% bf-brn calc. Sh mixed or in thin bds. Pyrite rare.

90

Sh; gry to grnh-gray; very slightly calc; some zones fine silty Sh; thin lamin; very thin zones of dolo. ls, probably less than 1/2 ft. of section. Imbedded selenite present; pyrite rare.

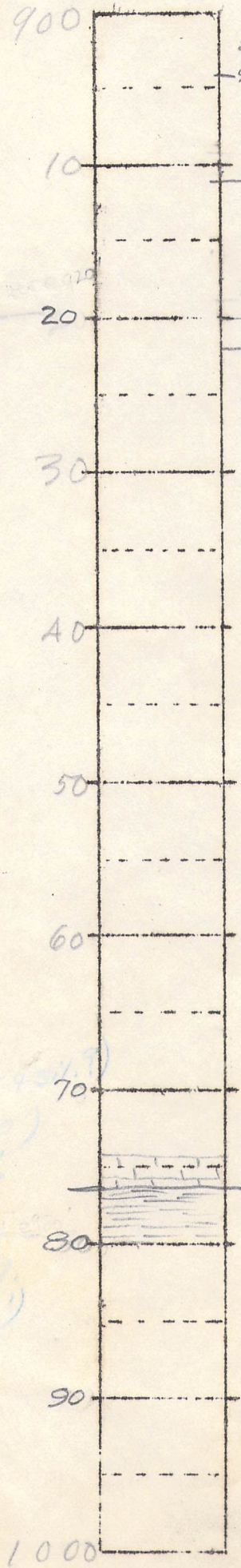
1091
879
212 = Mag-

900

City #8

Name of Well Fort Dodge, Wood 9 Sheet No. 10

Depth Range 900-1000 Scale: 1 inch=10 feet.



Shale, blue-green; micac; thinly laminated; some bright green; 40-45%; Limestone, dolomitic, gray, impure, 60± %; drills in small granules and some angular chips; flfs, probably ostracods.

Shale, greenish grey; dolomitic; some brn & some bright green; thinly laminated, 80-85%; Limestone, gray, 10-15%; ~~Sand~~, ~~Coal~~ ~~+10~~ %; Pyrite <1% imbedded shale.

Limestone, dolomitic, gray-brown, impure, 75-80%; med-coarse euhr. text, some intergrown lite SS; Pyrite rare; vein selenite and calcite present.

Sh - same as 911-920', apparently top of interval.

Limestone, dolomitic, like that in 920-930, 90%±; [Shale, intermixed - cave from above] with the Ls, 20%±; Pyrite±1%; [hard blue shale 10%]; Gypsum <10% selenite veins -

Dolomite, brown to buff; med to coarse euhr. interlocking text, moderate porosity; vein calcite and selenite; 90-95% of sample. [Shale, green-grey, 5% from above] Phosphatic shells & fish? spines - Pyrite <1%; Gypsum ±1%

Limestone, brown to buff to grey, impure, very fine grd, Saccher. text, 75-80%; Silty sh, grn-gry to bl-grn, <10% with imbedded long xtals of selenite; Euhedral clear quartz present in signif. amt; pyrite common ±1% some brassy to irridescent.

Limestone, dolomitic, grey to buff, rather soft, shaley 80-90%; shale, blue-green, 5-10%; Gypsum <1%; Selenite xtals. Pyrite, ±1%;

Limestone, grey to nearly buff white, med. to fine Sacch. text. impure(?) 60-65% Shale, 30-40% grn-gry, thin lamin. micac. second. minerals Pyrite <1%

Shale, green ish-grey, silty text. of second. clay minerals thinly laminated slightly calcareous, nearly 100%; Pyrite, 1-2% imbedded very fine euhedr

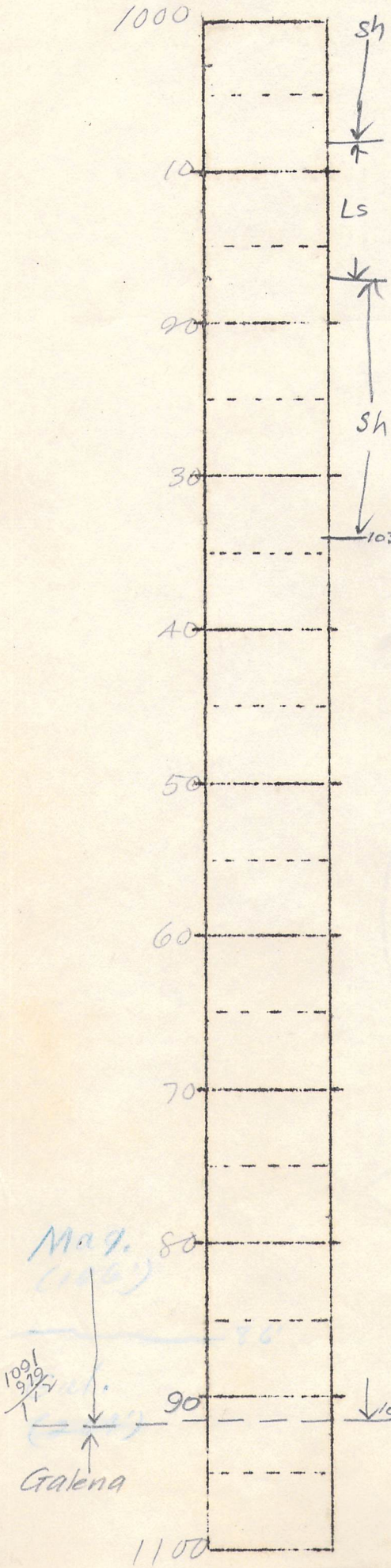
Shale, light grey, greenish, secondary micac. clay minerals slightly calcareous 70-80%; shale, like that in 980-990, 20-30%;

Limestone, buff, 1-10%; Pyrite <1%

City #8

Name of Well Fort Dodge Woods Sheet No. 11

Depth Range 1000-1100 Scale: 1 inch=10 feet.



Shale, silty greenish grey, slightly calcareous, thinly laminated, 60-70%; Limestone, grey, soft, intermixed with shale, 30-40% Pyrite ±1% Gypsum <1% ✓ in spindle xtals

Limestone dolomitic grey, rather soft, impure 60-70%; detrital qtz & insolube residue, 30-40%; Pyrite, ±1%. very silty and some zones grading to siltstone

Shale, grey to green, slightly calcareous, 80-90%; Limestone like 1010-1020, 10-20%; 50% of sample is made up of cinders,

Sh, r sls, grn-gry, non-calc, thin laminated, tough, in chips, brittle fracture.

Ls, dolomitic, creamy-gray, very fine xline texture

dolomitic cream to bf

~~Limestone~~ very calcareous, soft very fine grnd. solubility in acid probably 65-70%; — shale ±10%; Cinders used in drilling

Ls, bf to creamy gry; very dolomitic; fine euhedral saccha. texture; mod. porous; few grains gypsum, detrital qtz and abraded frags Sh (from above)

Gypsum <1% Qtz sand, 1-5%

Shale, light grey to blue-green, rather soft, 60-70%; Limestone, cream to buff, 30-40%; Pyrite, ±1%; Gypsum <1%

Dolomite, cream to buff, rather soft, 70-80%; shale, similar to 1060-1070, 5-15%; sand, qtz, C, ½-¼) 10-20%; Pyrite ±1%

Shale, blue-green to dark grey, soft, slightly calcareous; thin micac lamin; very fine euhd. pyrite imbedded; comprises 85% of sample. Chert, gry-wh in irreg. ang. frags, some fresh but much deeply altered to white clay (halloysite?) - prob. a weathering zone reworked at top of Galena.

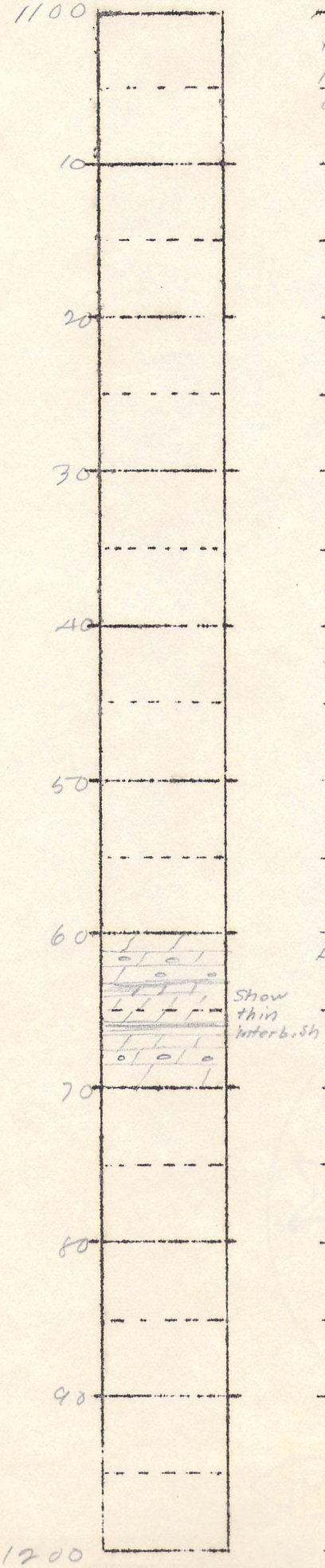
Dolomite, dark grey to blue-grey; med. euhr. texture; 85%± including weathered chert 10-15%; Chert, white,

[Sand, C, ½-¼ 1-10%; detrital qtz, included in dolomite probably 10-20%] Pyrite <1%

city # 8

Name of Well East Dodge Wagg Sheet No. 12

Depth Range 1100 - 1200 Scale: 1 inch=10 feet



Dolomite, similar to that found in 1090-1100, 60-70%; Chert, white, outside of pieces in some cases earthy, 30-40% Pyrite 1 to 2%, Sand, 1/4-1/8-C, 1-10%

Dolomite, buff to blue-grey, rather dense, 70-80%; Chert, white, similar to that in 1100-1110, 10-20%; Shale, blue, calcareous, 10-20%; Pyrite, ±1%

Dolomite, similar to that in 1110-1120, 60-70%; Shale, blue-grey, 10-20%; sand, 1/2-1/8, C to a, some showing secondary enlargement, 10-20%; Pyrite ±1%

Chert, 5-15%

Dolomite, cream to buff, dense, 70-80% chert, white, earthy in part, 10-20%; sand, 1/2-1/4, C, 5-15%; Pyrite, ±1%; Some Crinoid or cystoid stem fragments.

Dolomite, cream to grey, ~~dense~~ fine grnd. 70-80%; Chert, white, earthy in part, 10-20%; Sand, as in 1130-1140, 1-10%; Pyrite ±1%; Crinoid or Cystoid stems.

Dolomite, similar to that in 1140-1150, 70-80%; Chert, white 1140-1150, 10-20%; [sand, 1/2-1/4, C, some 2ndary enlargement <5%] Pyrite ±1%

Dolomite cream to buff, rather soft, impure, 50-60%; grey-grn calcareous shale or siltstone, 30-40%; sand, similar to that in 1150-1160, 1-10% Pyrite, 1 to 2%, Crinoid or Cystoid stems.

Dolomite, similar to that in 1160-1170, 70-80%; white, earthy to dense Chert 5-15%; Sand, as in 1140-1150, 1-10%; Gypsum, 1 to 2%; Pyrite ±1%; Crinoid stems still present

No Sample
(plot as dolo)

Cal.

Fifs-

Fifs-

City #8

Name of Well Fort Dodge Wood 2 Sheet No. 12

Depth Range 1200 - 1300 Scale: 1 inch=10 feet

1200

Dolomite, calcitic, grey to buff, in fine concr. granules; 80-85%; Shale, grey, calcareous, 5-10%; chert, white, earthy 10-15%; sand, ½-¼, C, 5-15%; Pyrite ±1%; Crinoid stem fragments common

10

Limestone, light grey, soft, impure, 75-85%; shale content high, 30-40%; sand, as in 1200-1210, 1-10%; Pyrite ±1%; crinoid or cystoid arm + stem frag. common.

20

Limestone, light grey to nearly white, dense, 60-70%; Chert, white, chalky (weathered) earthy in part, containing numerous impressions and casts of shell frag, 15-25%; Sand, ¼-⅛, as second, enlarged, 5-15%; Pyrite ±1%;

30

Ls, very dolomite, blue-grey, much open porous euhedr text. to dense, 60-70%; sand, ¼-¼, C, 20-30% cave; Pyrite 5-15%; Chert, 8-10%

Fifs, brach frags; few bryozoans?

Record?

42

Dolomite, very brown, iron stained, probably 5% iron oxide, 70-80%; Qtz sand, as in 1230-42, 15-25%; Some fragments of crinoid stems.

50

Dolomite, orange brown, iron stained, large amt of iron oxide; Vaherosatt, 80-90%; Qtz, as in 1230-42, 10-20%; Pyrite, ±1%.

60

Dolomite, orange-brown, similar to that found in 1250-60, 85-95%; Chert, 1-2%; sand, ¼-⅛, C, 1-10%

70

Dolomite, similar to 1250-60, 70-80%; Limonite, 10-20%; Qtz as in 1260-1270, 1-10%; some trilobite fragments.

80

Dolomite, like 1250-60, 60-70%; Chert, white, dense, 5-15%; Sand, ¼-⅛, 5-15%; Limonite, 1-5%.

Gal. (204')

90 Dec. not recognized

Dolomite, like 1250-60; 70-80%; Chert, white, 1-5%; Shale, grey, calcareous, 1-10%; Pyrite, ±1%

Plat? (40')

1300

city #8

Name of Well Fort Dodge, Wood Sheet No. 13

Depth Range 1300 - 1400 Scale: 1 inch=10 feet.

1300

Dolomite, grey to orange to brown 70-80%; shale or silt, grey, calcareous, 20-30%; qtz, fresh, angular, 1-5%; fossil frag. numerous.

10

Dolomite, grey to white, very dense 80-90%; Chert, white, containing impressions of shell frag. 10-20%. Pyrite, +1%

Recorded?

20

Dolomite, buff to yellow, finely crystalline 80-90%; sand, ¼-½, a, secondarily enlarged in part, 5-15%; chert, white, 1-5%; a few shell fragments.

Platt (40')

30

Shale, ~~blue-grey~~ pale grn, soapy when wet, 70-80%; [dolomite, hard, dense, cream to buff 10-20%] Probably from above ↑ sand, ¼-⅛, r, (same sand in shale) very fine a little secondary enlargement, 1-10%; Pyrite ¼%

40

Shale, soft, ~~green-grey~~ green-gray, soapy when wet, bluish-grey, 70-80%; slightly calcareous.

Glwd. (40')

50

Dolomite, hard, ~~buff~~ dark grey & brown - with phosphatic & carb. nodules in large pieces, may have been put in by drillers, 15-25%

Sand, as in 1330-40, 1-3%; Pyrite ¼%

Shale,

No Sample ↑ Same zone as Mason City Peoples Gas No 2 @ 680'

(plot as Grn-sh)

60

Shale, slicky blue ~~grey~~ green, ~~silty~~, non-calcareous, swells when wet 85-95%; dolomite in minute aggregates, 5-15%; Pyrite 1 or 2%. Pyrite very fine and thoroughly distr. ▽ dissem. in shale - some phosph. flakes

70

St. P. (40')

Sandstone, ~~90~~ 80% (90% - sand is ½-¼) C to a, iron stained with some limonite; [Shale grey-green non calcareous, 5-~~15~~%; Dolomite, buff ~~5~~ 1-~~15~~ 3%] All eqvd from above - May be light grey soft bentonitic sh -

80

Sandstone, brown to yellow 85-95%, sand is C to a ½-¼, secondary sil ¼-½; blue-grey shale, 5-15%; Dolomite, 1-5%

1370
979
391'

90

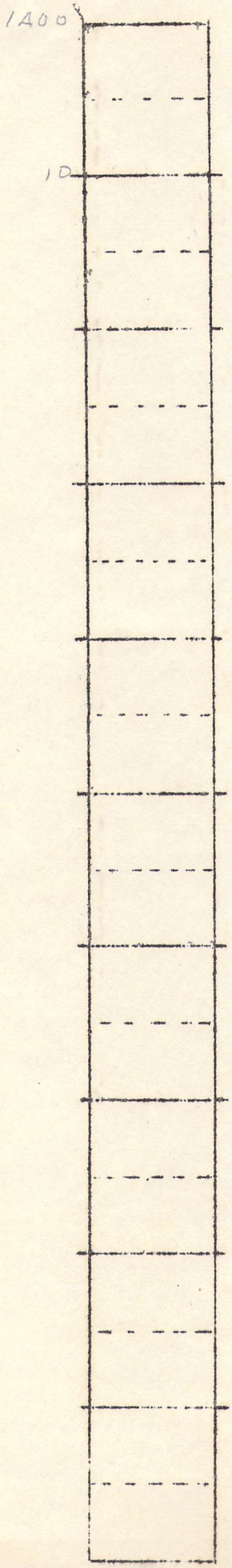
Sandstone, very light yellow, sand ½-¼, a to C, a little secondary enlargement, 85-95%; Green shale, 5-15%; Selenite in needle-like xls, <1%

1400

City #8

Name of Well Fort Dodge, Iowa Sheet No. 14

Depth Range 1400 - 1410 Scale: 1 inch=10 feet.



Sandstone, pure white, ¼-⅛, C to a, almost 100 90% Selenite xls, needle-like, <10%; shale ±1%

Sheet No..... Name of Well Fort Dodge (Webster) #8 ..... Survey No. 0009.....

Location ..... Date Drilled..... Analyst Heyden

00

10

20

30

40

Shale, blackish gray, v. slightly silty, micaceous, blocky.
little coal & pyrite and underclay; some loose ss. grains.
v. little lt. gray v. v. finely xln. ls.

50

Shale dull maroon to to pale grayish — streaked.
Redbeds (very little limonite yellow sh streaking)

60

Shale, as above, 95% +
Trace coal? Carb.
+ v. little gray earthy dense ls. soft. v. arg. sh. (color different from below)

Per Mon.

70

frag. ls. oxidized stained limonite yellow to buff, v. fossil, spicules, crinoids, bryozoa, 40%

ls. lt. gr. arg. sh, marly, v. fossil, hard to soft ls. 60%

80

sh, pale gn. gr. v. calc., 70
+ ls. lt. gr. dense 25 (Trace of quartz in alle phenocrysts)
+ 5% oxidized ls, salmon buff yellow — almost dense.

90

Dol. med. brown v. fine xln to granular, 60%.
wh. dol. ss. (ss. med to coarse, rounded & frosted) 19
frag. ls. gray, mod. xln, phenocrysts & rare shell frag. + crinoid frags. 20

v. little glau. dol ls. ls. oxidized, almost a salmon buff yellow, 3%.
Slightly phenocrysts?

2 00

Sheet No..... Name of Well..... Survey No.....

Location ..... Date Drilled..... Analyst.....

00

Calc. dol. as above, but more granular 87 + V. little gr. sh. dol. ss. to sdy dol.
lt. as above. 10
chert, chalcedonic, clear quartz & sct. white & Ket. Gray. 3%. crinoid

10

Dol. ls., med. bf, v.v. fine gran. dol.
tr. chalcedony. crinoid.
little sdy dol. & dol. ss.

20

dol, lt. buff, v.v.v. fine gran
v. little sdy dol. (ss med to larg) v.v. small brachiopod. shell.

30

ls. buff dense & oolitoid —
small white, tite-packed rounded oolitoid bodies. — ~~phenocrysts~~.
abd. fine ss. — some medium.

00

40

ls. oolitoid, as above, + some phenocrysts. calcite matrix.

50

ls. as. above.
crinoid frag.

60

ls. lt. buff., dense & v. fine xln — oolitoid & plain.

70

Shale, lt. grayish with greenish cast.
— gr. to ft. py. med. sdy sh.

80

ls. whitish to lt. buff, leached, small & v. small, oolitoid,
tite packed oolitoid bodies to v. pinpoints — calcite matrix

90

ls. as. above. leached

00

Sheet No..... Name of Well..... Survey No.....

Location ..... Date Drilled..... Analyst.....

00

ls. as above, except white larger, ls. more coarsely Xln.
little less leached.

10

~~Dow. Falls~~

Dol., lt. br., fine to med Xln to gran — slightly porous. 90%.
ls. as above 10%

Dow Falls

20

Dol, as above + 90%
Dol, lt. br, med Xln.

ls. lt. buff, fine to med. to large rounded to oval. porous. — calcite matrix,
stylolitic (in dol.) 10%

30

Dol. as above 50% stylolitic.
ls. as above
ls. whitish buff — some slightly leached — dense with v. fine calcite crystal — algal?
+ oolitic ls, small, round to long — calcite matrix.

40

30 Dol, med. br, v.v fine Xln + gran. + { v.v. fine to med Xln — (med lt. br. dol. crystals in v.v. fine calc. Xln matrix)
stylolitic.
30 + dol. as above.
40 + ls. as above.

50

50 Dol. lt. br. fine gran. slightly porous.
+ 20% dol 10% } as above

60

Dol. med br. gran slightly porous to Xln. — (shell casts in dol & chk)
10 { chk. med. brown, hard
+ chk, lt. whitish buff, opaque, slightly porous. (dolomitic type?)

70

Dol lt. gray, v. stylo. v. little.
Dol. grayish buff, v.v.v. fine Xln., 80
+ Dol, as above. 20

80

Dol. as above — with granular tendency, (But no stylo dol)

90

70% Chk, white Hard to dk. gray Soft. slightly mottled.
Dol. as above.

00

Sheet No..... Name of Well..... Survey No.....

Location ..... Date Drilled..... Analyst.....

4 00

dol & cht as above.
(cht - trace.)

4 10

Dol as above.
+ Dol, buff, fine x/n.

4 20

Dol, mod brown, fine x/n to gran. — dol. has trace) pyrite.
10% cht, lt. grayish buff, mottled, opaque.
+ cht, grayish tripolitic.

30

Dol as above.
60% cht, grayish, mottled opaque. + brownish grayish mottled
fossil shell caverns in cht.

40

60% cht, as above, but more grayish, & less brown —
Dol, lt. grayish brown. v.v. fine x/n to gran.

50

Dol. grayish lt. brn, v.v. fine x/n — almost dense — has granular tendency
60. cht, v.v. dk. gray Not to grayish opaque plain — unmottled.
Spicular!

60

Dol, grayish lt. brown, v.v. fine x/n,
15% cht, grayish, opaque, with heterogeneous assortment of inclusions.
(no sand gr in dol)

70

Dol. lt br, fine & med x/n.
(abd. fine rounded SS. + rare med. in dol)

80

Sh, lt. greenish drab; V pyritic, 85

SS. med to co, rounded & frosted, 15

90

dol. lt. br, fine to med x/n.

Sh, lt gr, flaky 10

00

Sheet No..... Name of Well..... Survey No.....

Location ..... Date Drilled..... Analyst.....

500 00

Sh. lt. gray ish, v. calc, s soft.

10

dol. lt. gr, v-v fine grn, v. argill. 90 (slightly sdy, sl fine to med)
v v ! sh. 10

Sh. lt gy gr 10%.

20

Gap

30

40

Ls. lt. to med br, dense 80
+ dol ls. lt. gr. med xln. (20

50

med to lt br, ls. lt. dol. ls., dense to med xln.

60

lt. buff. dol. ls. med to co xln. 30

(12) Dol. ls. gray. 30

Buff. med. Dol. 40

(v v v rare v v v fine ss -)

70

Dol. fine xln, gray 20 + Dol. lt. br. med to co xln. 80

sh, med gr drab, slightly dol. 30%

√ 126 (trace ss. fine to med v v v rare)

80

Dol. v.v.v. fine gray, greenish gr. 10

(12) Dol. white, med to co xln. 90

(v. rare med frosted fine to co wh opaque grains)

90

Dol, wh, med to co xln.

132

600

Sheet No..... Name of Well..... Survey No.....

Location ..... Date Drilled..... Analyst.....

6 00

Dol vfx, med to co xln.

10

as above.

0 0

Trace med to co. SS.
white.

20

Dol. a.a. vfx to lt. gr.

SS, some, mostly fine, some med to co.

white to amber stained —
stained & rounded & dk pebbles. (rare)] dolomite? sandstone?
stained & quite angular - pebbles ?

30

Dol. wht, gry, to lt. br, fine & co xln.

ls. wht. leached, v.v. fine & med xln.

only trace of SS.

40

Trace ls., dk to med br, with traces of asphaltic material in. (v. little)

dol. dk gry. v fine to med xln. 40

dol. lt. br. fine to med xln. 40

+ ls. leached wh. gr. } 5 15
+ dol. ls. wh gr.

pyrite
trace AA.

50

Dol. dk. br. med xln. 10

Dol. med br to lt. buff, fine to med xln.

pyrite.

6 60

Dol. fine to med, xln to somewhat gran, gray to lt. br.

sh, trace dk gr. pyrite + trace SS.

70

Dol. v. lt. buff, v.v.v fine xln, almost dense.

80

dolomite sand, med to co xls., lt. buff., shaly in interstices, (trace sl., fine.)
pyrite.

(Suggestion of fracturing & solution + quite a bit fissure filling ?)

90

tr SS.

Dolomite sand AA.

7 00

Sheet No..... Name of Well..... Survey No.....

Location ..... Date Drilled..... Analyst.....

7 00 Dolomite sand a a a
med. gr sh., v. little
+ dol, med Gr, v v v fine x'ln. 10%

10 lt gr. flaky sh, 50%
+ dolomite sand 25
+ white, earthy dense dol. 25

20 dol med to blk gr, fine to med x'ln. 85%
+ dolomite sand as above 15%

30 v. Het. Spls. gr sh, lt, flaky, Cave? 50%
dol, lt buff, v v fine x'ln
little wh. med sand.

7 40 dol, v fine x'ln, lt buff.
ss. raw, med, frosted.
lt gray ish dolomitic. 25%
little asphaltic residue.

50 med Gr. v v fine x'ln dol.
considerable asphaltic residue.

60 as above — less asphaltic n.

7 70 dol. lt gr. to buff v fine x'ln to almost dense
little asphalt

7 80 as above, mostly buff. to lt Gr.
little asphaltic n.

90 dol, Gr, fine grain; trace little pyrite.

8 00