WRD Exp. (GW)
Aug. 1964

Verified

U. S. DEPARTMENT OF THE INTERIOR — GEOLOGICAL SURVEY

Water Resources Division Well Schedule Form

MASTER CARD

COUNTY HWY

Record by: D. AARONSON — Source of data: FILE — Date: 6/30/65 — Map: 1:63360

State: IOWA [1 6] — County (or town): CALHOUN [1 3]

Latitude: 42 16 20 N (deg, min, sec) — Longitude: 094 24 56 (degrees, min, sec) — Sequential number: 1

Lat-long accuracy: 2 — T. 86 (N) R. 31 (W) Sec. 12, NW ¼ NW ¼ SW ¼ 5 (B & M)

Local well number: 0863 1W12cbb — Other number: W-0327

Local use: 00327 32CITY 2 — Owner or name: FARNHAMVILLE

Owner or name: FARNHAMVILLE IA — Address: FARNHAMVILLE, IA.

Ownership: (C) County, (F) Fed Gov't, (M) Mcly [circled], (N) Corp or Co, (P) Private, (S) State Agency, (W) Water Dist — M

Use of water: (A) Air cond, (C) Comm, (D) Dewatering, (F) Fire, (H) Dom, (I) Irr, (N) Ind, (P) P S, (S) Stock, (T) Instit, (U) Unused [circled] — U

Use of well: (A) Anode, (D) Drain, (G) Seismic, (O) Obs, (P) Oil-gas, (R) Recharge, (S) Spring, (T) Test, (U) Unused, (W) Withdraw, (X) Waste, (Z) Destroyed [circled] — Z

DATA AVAILABLE: Well data: 3 — Freq. W/L meas.: INTERMITTENT [I] — Field aquifer char.: [ ]

Hyd. lab. data: [ ]

Qual. water data: type: COMPLETE — C

Freq. sampling: INTERMITTENT [I] — Pumpage inventory: yes no, period: [ ]

Aperture cards: yes [ ]

Log data: GEOLOGIST LOG — G

WELL-DESCRIPTION CARD

SAME AS ON MASTER CARD — Depth well: 776 ft [776] — Meas. / Rept [circled] — accuracy: 0

Depth cased (first perf.): ft [ ] — Casing type: — Diam. 6 in [6]

Finish: (C) porous concrete, (F) gravel w. (perf.), (G) gravel w. (screen), (H) horiz. gallery, (O) open end, (P) perf., (S) screen, (T) sd. pt., (W) shored, (X) open hole, (Z) other — [ ]

Method Drilled: (A) air rot., (B) bored, (C) cable, (D) dug, (H) hyd rot., (J) jetted, (P) air percussion, (R) reverse rotary, (T) trenching, (V) driven, (W) drive wash, (Z) other — C

Date Drilled: JUNE 1932 [932] — Pump intake setting: 145 ft [145]

Driller: McCUTCHEON WELL CO. (name, address)

Lift (type): (A) air, (B) bucket, (C) cent., (J) jet, (L) multiple (cent.), (M) multiple (turb.), (N) none, (P) piston, (R) rot. [circled], (S) submerg., (T) turb., (Z) other — R — Deep / Shallow: D

Power (type): diesel, elec. [circled], nat gas, gasoline, hand, LPG gas, wind; H.P. — 5 — Trans. or meter no.:

Descrip. MP: 2.1 ft above [circled] / below lsd, Alt. MP 1146.9

Alt. LSD: 1144.3 [1144] — Accuracy (source): 7

Water Level: 100-110 ft above / below [circled] MP; Ft above / below [circled] lsd [110] — Accuracy: REPORTED — 6

Date meas.: SEPT 1942 [942] — Yield: 35 gpm [35] — Method determined: [ ]

Drawdown: 65 ft [65] — Accuracy: REPORTED [6] — Pumping period: 12-14 hrs [13]

QUALITY OF WATER DATA: Iron 1.1 ppm [5] — Sulfate 2534 ppm [7] — Chloride 20.0 ppm [1] — Hard. 561 ppm [8]

Sp. Conduct: K x 10^6 [ ] — Temp. 52.5 °F [53] — Date sampled: JAN. 1937 [137]

Taste, color, etc.: STRONG H_2S ODOR

0[illegible]-31W-12 cbb

Well Number 42 16 20 (W) 094 29 56
d m s d m s

HYDROGEOLOGIC CARD

SAME AS ON MASTER CARD | Physiographic Province: CENTRAL LOWLAND 12 | Section: WESTERN

LAKES B | Drainage Basin: RACCOON 25A | Subbasin:

Topo of well site: (D) local depression, (F) flat surface, (H) hilltop, hillside, (S) terrace, (T) valley flat, (V) UPLAND F

MAJOR AQUIFER: DEV-MISS system L series X aquifer, formation, group

Lithology: DOLOMITE D Origin: MARINE 6 Aquifer Thickness: ft

Length of well open to: ft | Depth to top of: ft

MINOR AQUIFER: system series aquifer, formation, group

Lithology: Origin: Aquifer Thickness: ft

Length of well open to: ft | Depth to top of: ft

Intervals Screened:

Depth to consolidated rock: 165 ft 165 Source of data: DRILLER'S LOG D

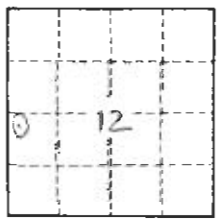
Depth to basement: ft Source of data:

Surficial material: Infiltration characteristics:

Coefficient Trans: gpd/ft; Coefficient Storage:

Coefficient Perm: gpd/ft^2; Spec cap: 5 gpm/ft; Number of geologic cards:

CASING:
6" TO 300 FEET
5" BELOW (?)
4" PUMP LINE

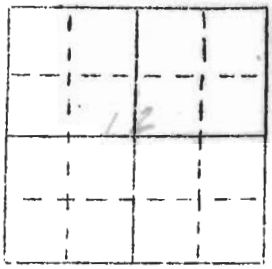


GPO 844-720

W-0327

IOWA GEOLOGICAL SURVEY
In Cooperation with U. S. Geological Survey

RECORD OF WELL



Location:

Town: Farnhamville (N E / S W); County Calhoun

NW-NW-SW sec. 12 T. 86 N., R. 31 W. E. Reading Twp.

Well name and number City Well #2

Owner _____ Address _____

Tenant _____ Address _____

_____

Contractor McCutcheon Well Co. Address _____

Drillers _____

Drilling dates June 1932 (drilled to 173' in 1930 by Fouts)

Well data:
Elevations: ~~Drilling~~ ~~curb~~ Measuring point 1146.4 feet; Land surface 1144.3 WEH. feet

1139 Gulf

_____

Determined by _____

Topographic position Upland

Total depth: Reported 776 feet, Measured 776 feet

Deepened from 173

Drilling method ~~Rotary~~ ?

Hole and casing data 6" to 30'± 5"(?) below 4" curbing

(Give amount, size, kind, and depth of all casing; type and position of seals and packers; cementing; how finished--perforated pipe, screen, gravel pack, open hole, etc.)

_____

_____

_____

Original depth to water _____ ft. above/below _____ Date _____

Original elevation of water level _____ ft.; Source of data _____

_____

Sources of water: Principal Dev-Miss.; Others 168-172

_____

Production data: Date 1937

Static depth to water 20 Measuring point 1146.4

Pumping level 90 at 41.7 g.p.m. ?(see water level data on back page)

Specific capacity _____ g.p.m. per ft. drawdown; Temperature 52 1/2 °F.

Pump data; Type pump Force Rotary Column Dia. _____ Length 145'

Cylinder or bowls: Dia. _____ Length _____ Suction pipe 8

Power Electricity Airline _____

Estimated rate of production: 41.7 g.p.m. for 12 - 14 hrs. a day

Use of water City supply & cooling

WATER ANALYSES (in parts per million)

Date sampled	Jan 29, 1937	Sept. 4, 1942		
Sampled by	H.G. Hershey	W.E. Hale & Travis		
Total solids	728.0	760.0		
Insoluble matter	8.0	5.0		
Alkalinity (Meo)	304.0	318.0		
Alkalinity (Phn)	0.0	0.0		
pH	6.9	7.3		
Fe_2O_3+ Mn_2O_3+Al_2O_3	9.0	13.0		
Alkali as sodium	22.4	81.0		
Calcium	150.1	106.5		
Magnesium	44.8	43.7		
Iron (unfiltered)	1.1	0.7		
Manganese	0.00	0.0		
Nitrate	~~3.0~~ 2.3	0.0		
Fluoride	2.0	1.5		
Chloride	20.0	20.0		
Sulfate	253.4	275.3		
Bicarbonate	370.9	387.9		
Hardness (ppm)	561.0	447		
Hardness (gpg)		26.1		

Remarks Strong H_2S odor

Laboratory data: Sample storage location _____

Sample range 290 - 776 No. spls. 25 No. dupls. & cond. 25 grox

Spls. prepared by _____ Washed range _____ by _____

Driller's log and cond. _____

Insoluble residues: Prepared by _____ Studied by _____ Strip log _____

Microscopic study 290-776 Hershey strip log Milton Consultants

Gen. log _____ Correl. by _____

WATER LEVEL DATA

Measuring point _____

Date	Depth to water	Altitude	Remarks
Sept 4, 1942	100 - 110		35 gpm with 65' d.d. (Reported by Walsh, operator)

REMARKS

UNITED STATES DEPARTMENT OF THE INTERIOR
Geological Survey
Water Resources Division

Water Quality
(ppm)

Local Well No. 086-31W-12 CBB
Aquifer Code(s) L X
Owner's Name FARNHAMVILLE CITY #2 (1932)
W Number 00327

Card Q

State: IOWA [19] (1 2) County: CALHOUN [13] (3 4) Town: FARNHAMVILLE, IOWA

Well No. Latitude [42 16 20 N] (5–11) Longitude [094 24 56] (12–18) Seq. No. [1] (19) Date M D Y [09 04 42] (20–25)

Sampling Depth [776] (26–29) Type [1] (30) $Kx10^6$ (31–35) pH [7.3] (36–38) Temp. °F [53] (39–41)

SiO_2 (42–44) Ca [106] (45–49) Mg [44] (50–53) Na +K [81.] (54–58) K [.C] (59–61)

HCO_3 [388] (62–65) CO_3 (66 67) SO_4 [275.] (68–72) Cl [20.] (73–78) Source No. [3] (79) [Q] (80)

Card R

Duplicate Columns 1-25 from Card Q

F [1.5] (26–28) NO_3 [0.] (29–32) PO_4 (33–35) B (36–38) Al (39–41) Fe [.7] (42–45)

Mn [0.] (46–49) Cu (50–52) Pb (53 54) Zn (55–57)

Solids Determined [760] (58–63) Calc. (64–69) Hardness Ca,Mg [447] (70–73) Non-Carb. [129] (74–77)

Color (78 79) No. [R] (80)

Card S

Duplicate Columns 1-25 from Card Q

Br (26–28) I (29–31) Alk. as $CaCO_3$ [318] (32–35) Free CO_2 (36–38) SAR (39–41)

RSC (42–44) ABS (45–47) (48–50)

Alpha (pc/l) (55–57) Beta (pc/l) (58–60) Ra (pc/l) (61–63) U (ug/l) (64–66)

No. [S] (80)

Recorded by: D. AARONSON

Punched by: T Date:

Published:

UNITED STATES DEPARTMENT OF THE INTERIOR
Geological Survey
Water Resources Division

Water Quality
(ppm)

Local Well No. 086-31W-12CBB
Aquifer Code(s) L X
Owner's Name FARNHAMVILLE #2 (1932)
W Number 00327

Card Q

State: IOWA (19) County: CALHOUN (13) Town: FARNHAMVILLE, IOWA

Well No. Latitude 42 16 20 N (5–11) Longitude 094245 6 (12–18) Seq. No. 1 (19) Date M 08 D 18 Y 84 (20–25)

Sampling Depth 776 (26–29) Type 1 (30) $Kx10^6$ (31–35) pH 7.3 (36–38) Temp. °F (39–41)

SiO_2 (42–44) Ca 82 (45–49) Mg 55 (50–53) Na +K 78 (54–58) K .C (59–61)

HCO_3 383 (62–65) CO_3 (66–67) SO_4 258 (68–72) Cl 14 (73–78) Source No. 3 (79) Q (80)

Card R

Duplicate Columns 1-25 from Card Q

F 2 (26–28) NO_3 0 (29–32) PO_4 (33–35) B (36–38) Al (39–41) Fe .45 (42–45)

Mn .02 (46–49) Cu (50–52) Pb (53–54) Zn (55–57)

Solids Determined 724 (58–63) Calc. (64–69) Hardness Ca,Mg 431 (70–73) Non-Carb. 117 (74–77)

Color (78–79) No. R (80)

Card S

Duplicate Columns 1-25 from Card Q

Br (26–28) I (29–31) Alk. as $CaCO_3$ 314 (32–35) Free CO_2 (36–38) SAR (39–41)

RSC (42–44) ABS (45–47) (48–50)

Alpha (pc/l) (55–57) Beta (pc/l) (58–60) Ra (pc/l) (61–63) U (ug/l) (64–66)

No. S (80)

Recorded by: D. AARONSON

Punched by: T Date:

Published:

086-31W-12 CBB
L

UNITED STATES DEPARTMENT OF THE INTERIOR
Geological Survey
Water Resources Division

W-0327

Water Quality
(ppm)

Card Q

State: IOWA 16 (1 2) County: CALHOUN 13 (3 4) Town: FARNHAMVILLE

Well No. Latitude 421620N (5–11) Longitude 0942456 (12–18) Seq. No. 1 (19) Date M D Y 012937 (20–25)

Sampling Depth 7 (26–29) Type (30) Kx10^6 (31–35) pH 6.9 (36–38) Temp. °F (39–41)

SiO_2 (42–44) Ca 150. (45–49) Mg 45. (50–53) Na (54–58) K (59–61)

HCO_3 371 (62–65) CO_3 0 (66–67) SO_4 253. (68–72) Cl 20. (73–78) Source No. 3 (79) Q (80)

Card R

Duplicate Columns 1-25 from Card Q

F .20 (26–28) NO_3 12. (29–32) PO_4 .00 (33–35) B (36–38) Al (39–41) Fe .11 (42–45)

Mn .000 (46–49) Cu (50–52) Pb (53–54) Zn (55–57)

Determined Solids 728 (58–63) Calc. (64–69) Ca,Mg Hardness 561 (70–73) Non-Carb. 257 (74–77)

Color (78–79) No. R (80)

Card S

Duplicate Columns 1-25 from Card Q

Br (26–28) I (29–31) Alk. as $CaCO_3$ 304 (32–35) Free CO_2 (36–38) SAR (39–41)

RSC (42–44) ABS (45–47) (48–50)

Alpha (pc/l) (55–57) Beta (pc/l) (58–60) Ra (pc/l) (61–63) U (ug/l) (64–66)

No. S (80)

Verified PMJ
Punched FCH

Recorded by: D. AARONSON

Punched by: _____ Date: _____

Published: _____

IOWA GEOLOGICAL SURVEY
Generalized Log Based on Detailed
Description of Drill Cuttings

Name of Well: Farnhamville City well Survey No. W-0227

Drilled by: McCutcheon Well Company Date June ,1932

Total Depth: 776 ft; Curb Elevation: 1139 ft; Static Level: 20 ft.

Casing Data: 6" to 300'±, 5"(?) below, 4" pump line.

Pump and Screen Data: Gould Rotary (4½" x 7'); 12" stroke.

Pumping Test: ____Hours ____Min; Gal. Per Min. 41.7 ; Drawdown 20 ft. in ____ min.

Description of Formations

No.	Rock Unit	Thick.	From (Feet)	To
	No samples		0	290
1	Dolomite, gray, drab and buff, fine texture; much chert, quartz; chert oolitic @ 320' and 350'; 4 samples marked @ 290, 320, 350 and 375 ft.	290		375
2	Limestone, white to gray, medium to coarse texture; glauconitic; some gray shale zones.	@		400
3	Limestone, similar to No. 2; slightly cherty.	@		425
4	Limestone, white to gray, fine to coarse texture, oolitic; brown to gray non-calcareous micaceous shale.	@		450
5	Limestone, like No. 4, slight increase in shale.	@		475
6	Limestone, buff, medium texture, oolitic, some clear quartz; light to dark gray shale common.	@		500
7	Dolomite, buff, fine to medium-grained texture with numerous small cavities.	@ 510, 525 and 550		
8	Dolomite, drab, medium texture, with 1/3 compact gray limestone	@		575
9	Dolomite, gray and white, fine-textured, small cavities; cherty and pyritic; some light green-gray non-calcareous shale.	@		590
10	Dolomite, drab, fine to medium crystalline texture; curved dolomite rhombs; slightly cherty at 625' and 660'.	@ 600, 625, 650 & 660		
11	Dolomite, gray, calcareous, fine texture; 5%± chert; 6% gray shale @ 685'; oolitic @ 700'.	@ 685 & 700		
12	Limestone, gray, very fine to medium-grained; dolomitic and cherty	@ 720 & 730		
13	Dolomite, gray, medium texture, pyritic	@ 750, 760 and 770		
14 *	Limestone, white to light gray, medium to fine texture, pyritic	@ 780, 790 and 810		
15	Limestone, drab to gray, medium to fine texture; green-gray shale 1-3%; chert 5% @ 920'; pyritic; all slightly dolomitic, 30% at 930'.	@ 910, 920, 930, 1050 and 1080		

Notes: *Units 14 and 15 between 780 and 1080 feet apparently from a different well, samples mislabelled.

Sheet No. 1 Name of Well. Farnhamville City Well Survey No. W-0327

Location Farnhamville (Calhoun Co.) Date Drilled June 1932 Analyst Hershey

Note: No samples from 0 to 290'.
Samples all marked with one depth to which arrow points.

00
10
20
30
40
50
60
70
80
90
00

290

Dolomite - very light gray to drab, calcareous, very fine crystalline, pyrite in small crystalline masses, and small amt. of curv. clear qtz. maj. gr. 1-½ mm., frosted, one grain seen included in dolomite.
One fragment of coal observed (may be cave)

Sheet No. 2 Name of Well Farnhamville Survey No. W-0327

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

00

10

Dolomite 65% - buff, drab & gray, fine to very fine crystalline, pyritic in part.
Siliceous material 30% - ranging from clear sharp ang. qtz to white & drab
Chert which is in part oolitic. Few rounded qtz. grains and few
euhedral qtz. crystals.
Shale 3% - drab to dark gray, non-calc.

20 @ 320

30

Dolomite - chiefly drab, highly calcareous in part, very fine crystalline,
very slightly pyritic. Sample contains 2% clear ang. qtz chips and
White chert which is in part oolitic. (bands of cloudy qtz.)
Shale 1% - gray, non-calc., highly micaceous, with thin cooly streaks.
Trace of rounded qtz. grains, and few euhedral qtz crystals

40

50 @ 350

Dolomite 50% - chiefly drab, similar to sample marked 350'
Limestone 45% - White to very light drab, very highly fossiliferous.
Shale 5% - dark gray, non calc.

60

70

@ 375

80

Limestone - white to light gray, with little buff, med. to coarse crystalline,
highly glauconitic, very slightly pyritic, soft. Little clear ang. qtz
Shale 10% - dark gray, non-calc., not silty or sandy.

90

00 @ 400

Sheet No. 3 Name of Well. Earnhamville City Well Survey No. W-0327

Location Earnhamville (Calhoun Co.) Date Drilled Analyst Hershey

00

10

20

@ 425

Limestone - white to light drab, med. to coarse crystalline, slightly glauconitic
Small amt. of clear angular qtz., few euhedral qtz crystals.
Trace of chert same color as ls.
Small amt. gray shale.

30

40

Limestone - white to very light drab, coarse to fine crystalline, oolitic in part, pyritic.
Quartz 5% - clear, angular
Shale 2% - brownish med. gray, non-calc., slightly gritty between the teeth, micaceous.

@ 450

50

60

Limestone - very pale buff gray, small part oolitic, very fine crystalline
Small amt. clear ang. sharp qtz. as above. Trace of pyrite
Shale 5% - brownish med. gray to black, non-calc.

70

@ 475

80

90

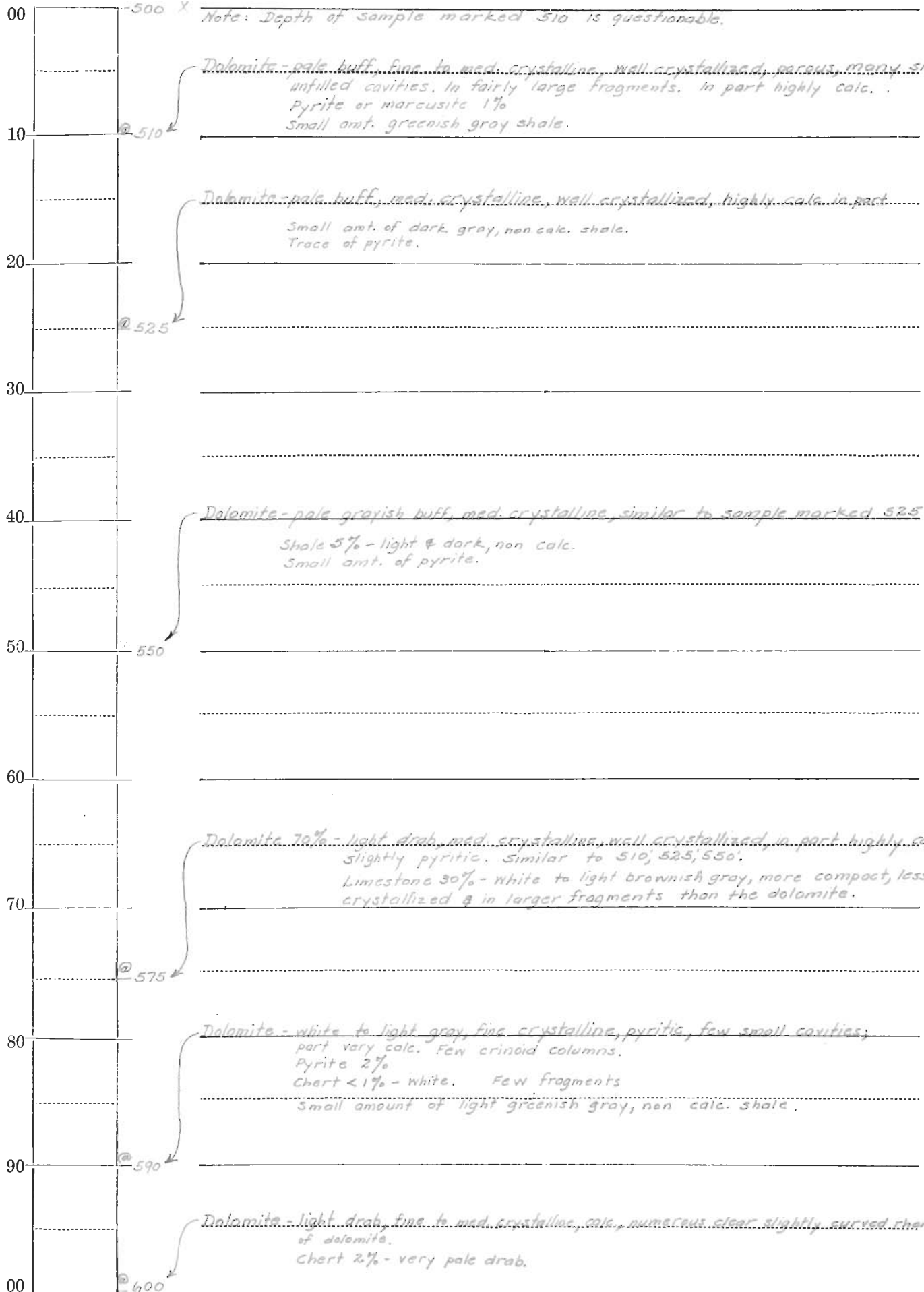
Limestone - pale buff gray, med. crystalline, very slightly oolitic
Small amount of clear ang. qtz. Trace of pyrite
Shale 7% - light to dark gray, micac., non-calc.

00

@ 500

Sheet No. 4 Name of Well. Farnhamville City Well Survey No. W-0327

Location Farnhamville (Calhoun Co.) Date Drilled. June 1932 Analyst. Hershey



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7

Sheet No. 5 Name of Well. Farnhamville City Well Survey No. W-0327

Location Farnhamville (Calhoun Co.) Date Drilled June 1932 Analyst Hershey

00
10
20
30
40
50
60
70
80
90
00

600

@625 ← Dolomite - light gray, very fine to fine crystalline, compact, with 20% light drab
Similar to sample marked 600
Trace of pyrite. Some calcite. Trace of chert
May be dolomitic ls

@650 ← Dolomite - drab gray, med. to fine crystalline, some calcite. Calcareous
No chert or pyrite observed.
May be dolomitic ls

@660 ← Dolomite - light gray to drab gray, calcareous, fine crystalline
Small amt. of cream colored chert
May be dolomitic ls.

@685 ← Dolomite light gray, calc., fine crystalline, (may be dolom. ls.)
Chert 5% - white to cream.
Shale 5% - light to med. gray, non calc.

@700 ← Limestone - dolomitic, light drab gray, fine crystalline, (stained; ls 70, dolo 30)
Chert 3% - white, gray & drab, oolitic in part.

Sheet No. 6 Name of Well. Farnhamville City Well Survey No. W-0327

Location Farnhamville (Calhoun Co.) Date Drilled June 1932 Analyst Hershey

00
700

10

Limestone - light gray, fine to very fine crystalline, somewhat dolomitic.
Chert 3% - white, buff, gray,
Small amount of light gray non-calc. shale, slightly carbonaceous (cave)

20
720

Limestone - light gray to light drab, med. to fine crystalline, dolomitic
slightly pyritic.
Small amt. of gray non-calc. shale which is slightly carbonaceous. (Cave)

30
@ 730

40

Dolomite - light gray, med. to fine crystalline, slightly pyritic, well crystallized.

50
@ 750

Dolomite - white to very light gray, med. crystalline, slightly pyritic.
drilled to fine fragments.

60
@ 760

Dolomite - white, light gray & drab, med. crystalline, somewhat pyritic

70
@ 770

Limestone - white to light gray, med. to fine crystalline, pyritic; much free calcite

80
@ 780

Not Farnhamville well

Limestone - white to light drab, med. to fine crystalline, pyritic.

90
@ 790

00

Sheet No. 7 Name of Well (Forehamville)? City Well Survey No. W-0327

Location Forehamville (Calhoun Co.) Date Drilled June 1932 Analyst Hershey

00

10 — 810

Limestone - light gray to light drab, med. to very fine crystalline, dolomitic in part, pyritic.

20

30

40

50

60

70

80

90

00

Sheet No. 8 Name of Well Farnhamville City Well Survey No. W-0327

Location Farnhamville (Calhoun Co.) Date Drilled June 1932 Analyst Hershey

00

@ 910 Limestone - drab, med. to fine crystalline, dolomitic,
Small amt. of pale greenish gray shale (2%)

10

@ 920 Limestone - drab, darker than 910, dolomitic in part, med. to fine crystalline
Chert 5% - white to drab, banded in part.
Shale 2% - pale grayish green, slightly calc., micac. (cave)

20

@ 930 Limestone - light brown & white, med to coarse crystalline, dolomite
chert <1% - white & light brown. Trace of pyrite
Shale <1% - pale greenish gray.
(Logwood Sol. shows 70% ls, 30% dolo.

30

40

50

60

70

80

90

00

Sheet No. 9 Name of Well (Farnhamville) 2 City Well Survey No. W-0327

Location Farnhamville (Calhoun Co.) Date Drilled June 1932 Analyst Hershey

00

10

20

30

40

50 @ 1050

Limestone - drab with a little buff & gray, med. to fine crystalline, dolomitic.
Shale <1% - bluish green, slightly calc., compact.
Trace of free pyrite

60

70

80 1080

Limestone - light gray, slightly dolomitic in part, very fine to fine crystalline, silty.
Small amt. of drab dolom. ls. present.
Small amt. of pale to bluish green shale (cave)

90

00