MAP NO. W-0451

STATE: Iowa
COUNTY: Poweshiek
T. | R.

ALTITUDE: 1014
PRODUCTION: Aprox. 500 g.p.m.

COMPANY: GRINNELL
FARM: City Well No. 6
WELL NO.
CONTRACTOR: Thorpe Bros.
COMMENCED: Nov. 1, 1925
COMPLETED: Sept. 1926
REMARKS: Sample Range 200-2500
T.D. 2500

CASING RECORD

	16" Steel liner 1198-1908'
	10" 8¼" W.I. 290'-1198'
~~22"~~ 20" Steel +3 to 207'	10" ~~6⅝"~~ W.I. 1198-1700
16" 15½" C.I. 0'-300'	10" 5 1/16" Open hole below
14" Steel 12½" liner 458'-698'	

SHOT | QUARTS | BETWEEN

Form 186—In stock and for sale by MID-WEST PTG. CO., TULSA

MAP NO. W-0151

STATE Iowa

COUNTY Poweshiek

T. R.

ALTITUDE

PRODUCTION

COMPANY Grinnell

FARM WELL NO.

CONTRACTOR

COMMENCED

COMPLETED

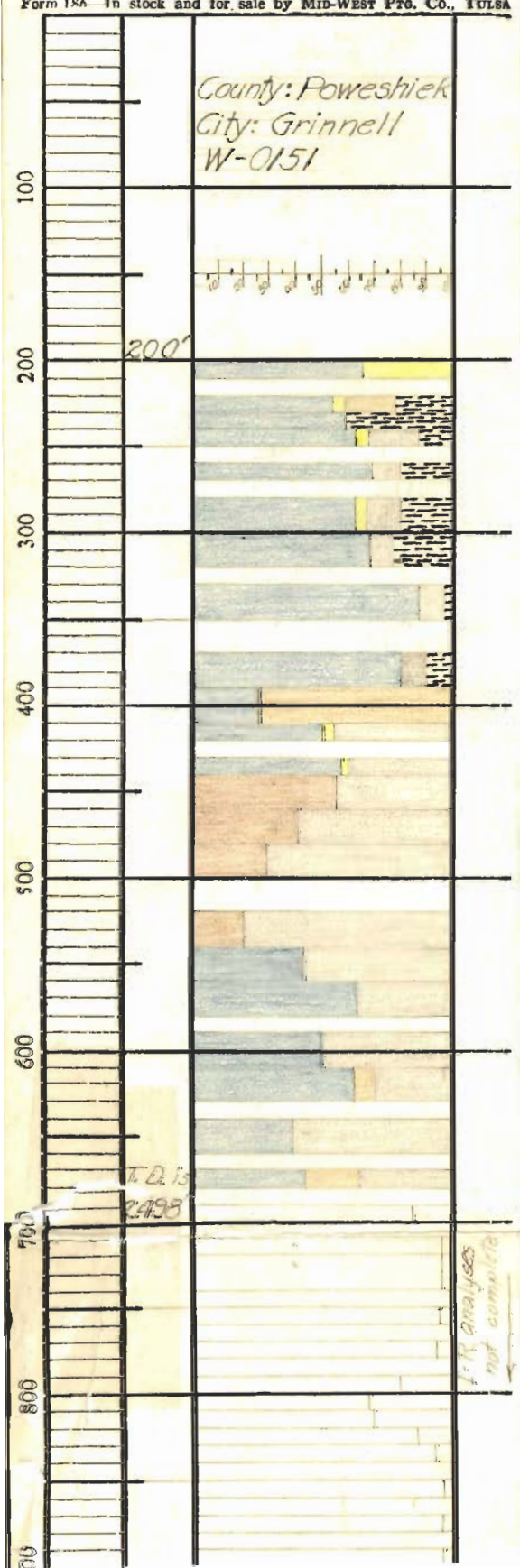
REMARKS I.R. study

CASING RECORD

	10"
	8¼"
20"	6⅝"
15½"	5 3/16"
12½"	

SHOT QUARTS BETWEEN

Form 186 In stock and for sale by MID-WEST PTG. CO., TULSA



WRD Exp. (GW)
April 1966

Well No. 080-16W-16 BCB

WELL SCHEDULE

U. S. DEPT. OF THE INTERIOR — GEOLOGICAL SURVEY — WATER RESOURCES DIVISION

MASTER CARD

Record by D. AARONSON | Source of data FILE | Date 1/30/67 | Map 1:63,360 COUNTY HWY.

State IOWA [16] | County (or town) POWESHIEK [79]

Latitude: 41°43'32" N | Longitude: 092°43'32" | Sequential number: 3

Lat-long accuracy: 2 | T 80 S, R 16 W | Sec 16, NW ¼, SW ¼, NW ¼ 5

Local well number: 080 16W 16 BCB | Other number: W-0151 B & M

Local use: 0 0 1 5 1 | 2 6 CITY | 6 | Owner or name: GRINNELL CITY WELL #6

Owner or name: GRINNELL IOWA | Address: GRINNELL, IOWA

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

Use of water: (A) Air cond, (B) Bottling, (C) Comm, (D) Dewater, (E) Power, (F) Fire, (H) Dom, (I) Irr, (M) Med, (N) Ind, (P) P S, (R) Rec, (S) Stock, (T) Instit, (U) Unused, (V) Repressure, (W) Recharge, (X) Desal-P S, (Y) Desal-other, (Z) Other — P

Use of well: (A) Anode, (D) Drain, (G) Seismic, (H) Heat Res, (Φ) Obs, (P) Oil-gas, (R) Recharge, (T) Test, (U) Unused, (W) Withdraw, (X) Waste, (Z) Destroyed. — W

DATA AVAILABLE: Well data 3 | Freq. W/L meas.: INVENTORY Ø | Field aquifer char.

Hyd. lab. data:

Qual. water data; type: COMPLETE — C

Freq. sampling: INTERMITTENT (8/24/35) I | Pumpage inventory: yes / no, period:

Aperture cards: yes

Log data: GEOLOGIST LOG — G

WELL-DESCRIPTION CARD

SAME AS ON MASTER CARD | Depth well: 2500 ft [2500] Meas. rept DRILLER'S LOG accuracy 3

Depth cased: (first perf.) 1700 ft [1700] | Casing type: STEEL ; Diam. 16 in [16]

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

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

Date Drilled: SEPT. 1926 [926] | Pump intake setting: ft

Driller: THORPE WELL CO. (name), DES MOINES, IA. (address)

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

Power (type): diesel, elec, nat gas, gasoline, hand, LP gas, wind; H.P. | Trans. or meter no.

Descrip. MP LSD ft above/below LSD, Alt. MP 1020

Alt. LSD: 1020 [1020] | Accuracy: (source) ALTIMETER — 7

Water Level 265 ft above/below MP; Ft above/below LSD [265] | Accuracy: DRILLER'S LOG — D

Date meas: SEPT. 1926 [926] | Yield: 650 gpm [650] | Method determined

Drawdown: 90 ft [90] | Accuracy: 3 | Pumping period hrs

QUALITY OF WATER DATA: Iron 0.54 ppm [4] | Sulfate 391 ppm [7] | Chloride 24 ppm [1] | Hard. 415 ppm [7]

Sp. Conduct 1340 K x 10^6 [5] | Temp. 76 °F [76] | Date sampled 7/26/60 [760]

Taste, color, etc.

Punched FRC — Verified FCH

Well No. 080-16W-16 BCB

Well No. 080-16W-16BCB

Latitude-longitude 41 44 32 (N) S 092 43 32.3
d m s d m s

HYDROGEOLOGIC CARD

SAME AS ON MASTER CARD [1–19]

Physiographic Province: CENTRAL LOWLAND [20–21: 12] Section: DISSECTED

TILL PLAIN [22: E] Drainage Basin: IOWA [23–25: 25D] Subbasin: [26]

Topo of well site: (D) depression, (C) stream channel, (E) dunes, (F) flat, (H) hilltop, (K) sink, (L) swamp, (Φ) offshore, (P) pediment, (S) hillside, (T) terrace, (U) undulating, (V) valley flat — UPLAND [27: F]

MAJOR AQUIFER: CAMBRIAN system, UPPER series [28–29: C3] JORDAN SS. aquifer, formation, group [30–31: SJ]

Lithology: MEDIUM SS. [32–33: 3V] Origin: MARINE [34: 6] Aquifer Thickness: 54 ft

[35–37: 054] Length of well open to: 54 ft [38–40: 054] Depth to top of: 2190 ft [41–43: B19]

MINOR AQUIFER: ORDOVICIAN system, LOWER series [44–45: LP] PRAIRIE DU CHIEN aquifer, formation, group [46–47: LP]

Lithology: CHERTY DOL. & SS [48–49: QD] Origin: MARINE [50: 6] Aquifer Thickness: 460 ft

[51–53: 460] Length of well open to: 460 ft [54–56: 460] Depth to top of: 1730 ft [57–59: A73]

Intervals Screened: NONE

Depth to consolidated rock: ft [60–63] Source of data: [64]

Depth to basement: ft [65–68] Source of data: [69]

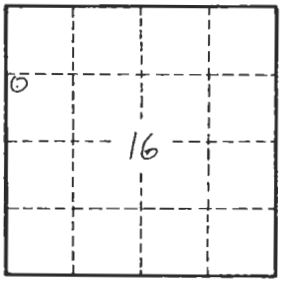
Surficial material: [70–71] Infiltration characteristics: [72]

Coefficient Trans: gpd/ft [73–75] Coefficient Storage: [76–78]

Coefficient Perm: gpd/ft^2; Spec cap: 7.2 gpm/ft; Number of geologic cards: [79]

CASING:

210' OF 22" STEEL PIPE +3'-207'
300' OF 16" C.I. PIPE FROM 0-300'.
908' OF 12" N.I. PIPE FROM 290'-1198'.
502' OF 10" N.I. PIPE FROM 1198' TO 1700'.
240' OF 14" STEEL LINER 458'-698'
210' OF 12" STEEL LINER 1198'-1408'



Well No. 080-16W-16BCB

GPO 857-700

7½' Grinnell South Quad
41 44 29N - 092 43 31 - 03
080 - 16W - 16 BCBD
1950/ Located by D. Kirsten in 1980

IOWA GEOLOGICAL SURVEY — W-0151

In Cooperation with U. S. Geological Survey

RECORD OF WELL

Location:

Town: Grinnell (N E / S W): County Poweshiek

NW-SW-NW sec. 16 T 80 N., R. 16 W. Grant Twp.

Well name and number Grinnell #6

Owner City of Grinnell Address

Tenant Address

Contractor Thorpe Well Co Address Des Moines

Drillers

Drilling dates Nov. 1, 1925 to Sept. 1926

Well data:

Elevations: Drilling curb 1020 feet; Land surface feet

Determined by

Topographic position Upland

Total depth: Reported feet, Measured 2498 feet

Drilling method drilled.

Hole and casing data 210' of 22" steel pipe + 3-207'; 500' of 16" C.I. pipe from surface to 3??; 240' of 14" steel liner from 458' to 698'; 210' of 12" steel liner from 1198' to 1408'; 908' of 12" W.I. pipe from 290' to 1198'; 502' of 10" W.I. pipe from 1198' to 1700'

Original depth to water ft. above / below Date

Original elevation of water level ft.; Source of data

Sources of water: Principal Ordovician-Cambrian; Others

Production data: Date

Static depth to water 265 Measuring point

Pumping level 355 at 650 g.p.m.

Specific capacity g.p.m. per ft. drawdown; Temperature 75 °F.

Pump data: Type pump Turbine Column Dia. Length 420

Cylinder or bowls: Dia. Length Suction pipe 10

Power Electricity Airline

Estimated rate of production: g.p.m. for hrs. a day

Use of water

WATER ANALYSES (in parts per million)

Date samples	March 13, 1937	Aug. 30, 1940		
Sampled by	A.C. Tester	H.G.M.		
Total solids	814.0	822		
Insoluble matter	10.0	17.0		
Alkalinity (Meo)	282.0	298.0		
Alkalinity (Phn)	0.0	0.0		
pH	7.4	7.2		
Fe_2O_3+ Mn_2O_3+Al_2O_3	3.0	2.0		
Alkali as sodium	119.2	118.8		
Calcium	107.2	94.3		
Magnesium	34.1	34.9		
Iron (unfiltered)	1.2(?)	0.2		
Manganese	0.02	0.00		
Nitrate	0.30	0.00		
Fluoride	1.0	2.0		
Chloride	26.0	25.0		
Sulfate	327.5	330.8		
Bicarbonate	344.0	363.6		
Hardness (ppm)	410.0	379		
Hardness (gpg)	24.1	22.2		

Remarks

Laboratory data: Sample storage location

Sample range 200-250 No. spls. 222 No. dupls. & cond.

Spls. prepared by Washed range by

Driller's log and cond.

Insoluble residues: Prepared by Studied by Strip log

Microscopic study strip log

Gen. log Correl. by

G. Pyle

W-0151 Grinnell [Mississippian Only] Carmichael

(Chem-Anal. of Rock)		Fluorite	Apatite	Chitin	Barite	Anhydrite	Celestite	Pyrite	Sphalerite	Zircon-zoned	Zircon-unzoned	Tourmaline-green	Tourmaline-brown	Tourmaline-blue	Garnet	Leucoxene	Anatase	Titanite	Rutile	Ilmenite+Mag.	Glauconite	Hornblende	Tremolite	Mica	Chlorite	Epidote	Staurolite	Pyroxene		Anhydrite	Chert	Clay aggregates	Feldspar	Glauconite	Gypsum	Muscovite	Quartz
	Limestone [200-250] (Drift)				R			very C		R	R	R	R	X	R	C			X			C				X	X	X		X	A	A	R			X	A
(280-300) (330-350) (370-390)	Limestone [260-390] (Drift)	1 grain 300-320			X			F		X	R	X	X		X	X		X	X			R				X	X	X			very C	A	R	X	X		C
(440-460) (590-610) (680-690)	Siltstone [390-410]				X			F		R	R	R	R	X	R		X		X			R					X					X	A				F
Kinderhook	Ls. (shaly) Sh. (calcareous) 410-680				R			F		X	X	X	X		X							R				X	X					F	R				C
720-740																																				
800-820																																				
860-880																																				
920-940																																				
950-970																																				
1010-1030																																				
1080-1100																																				
1130-1150																																				
1170-1190																																				
1370-1390																																				
1420-1440																																				
1510-1530																																				
1630-1640																																				
1670-1690																																				
1760-1780																																				
1850-1870																																				
2000-2020 2060-2080 2150-2170	2280-2300 2380-2400 2488-2500																																			

Mississippian

IOWA GEOLOGICAL SURVEY
Iowa City, Iowa

Results of Pumping Test

Grinnell City Wells, Grinnell, Iowa

June 15-16, 1942

WELL DATA:

City Well No. 4:
Location - NW¼ SW¼ NW¼ sec. 16, T. 80 N., R. 16 W., Grant Township.
Elevation - 1020.62 (top of circular concrete base, 1 foot above ground)
1022.13 (top of 2" pipe at base of air gage)

City Well No. 5:
Location - (same as well No. 4)
Elevation - 1020.09 (top of 20-inch casing)
Total depth - 2260' (deepened from 2006 feet in 1942)
Pump - Johnson turbine, single pulley. Bowls at 400', no tailpipe.
Power - Caterpillar diesel engine

City Well No. 6:
Location - (same as well No. 4)
Elevation - 1019.88 (top of pump base at breather hole by air gage)
Total depth - 2498'
Pump - Sterling turbine, 1300 R.P.M. 15 stage 10" bowls at 420' with 6' tailpipe
Power - 100 H.P. electric motor

Well No. 4 is 93' east of Well No. 5.

Well No. 6 is 42.5' east and north of Well No. 5.

Productions on Well No. 5 measured with 1 foot weir.

Measuring point of Well No. 4 is top of 2" pipe below air gage; elevation = 1022.13.

Measuring point of Well No. 5 is top of wooden clamp blocks 0.49' above top of 20" casing; elevation = 1020.57.

Measuring point of Well No. 6 is top of pump base at breather hole; elevation = 1019.88.

Depth to Water in Feet Below Measuring Point

Time	Well No. 4	Well No. 5	Well No. 6	Remarks
6-13-42				
11:36 a.m.		271.98		Static level.
11:52			270.79	Static level.
2:00 p.m.		271.54	270.49	Static level.
6-15-42				
1:55 p.m.		271.33		
2:02			270.16	
2:07				Start Well No. 5, water muddy.

Time	Well No. 4	Well No. 5	Well No. 6	Remarks
2:25				200 g.p.m.
2:27		293.89		200 g.p.m.
2:45			274.02	
2:53			274.25	
2:54		294.10		Water clearing up.
3:00				Temp. water - 74 3/4° F. air - 66°F. Measured after passing through 35' of 6" pipe.
3:13		294.37		200 g.p.m.
3:15			274.63	
3:37				200 g.p.m.
3:38		294.42	274.77	
3:55		294.43		
3:56			274.88	200 g.p.m.
4:05				Pumping rate increased.
4:06		below 300'		330 g.p.m.
4:12		below 300'		357 g.p.m.
4:21			277.14	
4:49			277.85	
4:54		317 (by city)		
4:58				357 g.p.m. Temp. water - 74 3/4° F. air - 66° F. Pumping fine sand.
5:13			278.18	
5:43			278.37	
7:00			278.79	
7:03				357 g.p.m. Temp. water - 74 3/4° F. air - 65° F.
7:26	282.06			
7:38				357 g.p.m.
7:39		317'2½" (by city)		
8:20		317.36		#5 water level fluctuating badly. Very difficult to measure.
8:27			279.16	
8:29				357 g.p.m. Temp. water = 74 3/4° F.
8:36:45				No. 5 pump stopped.
8:37:15		300.00		
8:38:15		286.62		
8:39		279.33		
8:40		274.38		
8:41		273.99		
8:42		273.84		
8:43		273.72		
8:44		273.57		
8:45		273.42		
8:46		273.33		

Time	Well No. 4	Well No. 5	Well No. 6	Remarks
8:47		273.23		
8:48		273.14		
8:49		273.04		
8:50		272.97		
8:52		272.82		
8:54		272.70		
8:56		272.58		
8:58		272.50		
9:00		272.41		
9:02		272.33		
9:04		272.25		
9:06		272.18		
9:08		272.10		
9:10		272.06		
9:15		271.95		
9:20		271.85		
9:30		271.71		
9:32			272.21	
9:40		271.56		
9:50		271.46		
9:56			271.90	
10:00		271.35		
10:15		271.23		
10:28			271.62	
10:30		271.16		
10:45		271.10		
10:55			271.48	
11:15		270.99		
11:18	274.22			
11:30		270.94	271.32	
6-16-42				
12:15 a.m.		270.85		
12:20			271.17	
12:30		270.80		
7:27			270.81	
7:30		270.08		Water entering well by hose.
7:41	273.7±			
7:45		270.10		Water entering well by
7:54			270.64	hose.
7:56	273.53			
8:00			270.67	
8:01				No. 6 pump started.
9:48			340.00	800± g.p.m.
9:50			335.84	
10:03	320.21			
10:06			336.08	
10:25			336.32	
10:40		284.61		
10:48			336.55	
10:50				No. 5 pump started.

Time	Well No. 4	Well No. 5	Well No. 6	Remarks
10:53				No. 5 - 237 g.p.m.
10:55				No. 5 - 357 g.p.m.
11:00			342.23	
11:05				No. 5 - 350 g.p.m.
11:10				No. 5 - 350 g.p.m.
11:15			343.70	
11:20	329.42			
11:30			344.33	No. 5 - 350 g.p.m.
11:45			344.72	No. 5 - 357 g.p.m.
12:55 p.m.			341.23	No. 6 - pumping rate lowered.
1:00	328.21			Sample taken for chemical analysis. Temp. water - 74 3/4°F. air - 67°F.
1:05	328.28			
1:09			341.43	

Elevations in Grinnell Well Field

(All elevations from U.S.C. & G.S. Bench Mark at Railroad Depot)

1. X chiseled in curb at telephone pole N. of No. 5 well, E. side of street = 1017.54.

2. Copper bolt and washer set vertically in NW side of telephone pole, 40' W. of Well No. 5 and 60' NE of NE corner of waterworks plant, 2' above ground, stamped U.S.C.&.-B.M.-1020. = 1020.00.

3. Well No. 4, top of circular concrete base, 1' above ground = 1020.62.

4. Well No. 4, top of 2" pipe at base of air gage = 1022.13.

5. Well No. 5, E. edge of top of 20" casing = 1020.09.

6. Well No. 6, top of pump base at breather hole by air gage = 1019.88.

Dr. M. A. Stainbrook's Notes

W-0151
Grinnell (Poweshiek)
Grinnell City Well #6

550-60	dolomite, gray, saccharoidal, some gray shale
560-70	dolomite, gray and shale
570-80	as above
580-90	dolomite, gray, saccharoidal Conodont
590-600	shale
600-10	shale (not well washed)
610-20	dolomite and shale
620-30	shale Charophytes common, Tentaculites, crinoid segments, pyrite gastropod, brach fragments
630-40	shale and dolomite (not well washed)
640-50	shale (not well washed)
650-60	" "
670-80	shale
680-90	dolomite, shale (not well washed)
690-700	limestone. Dolomite fossils (Cedar Valley?)
700-10	limestone (some shale, cave?)
710-20	limestone, fossiliferous (Cedar Valley)

550-90 Lime Creek dolomite Owen member
590-690 Shale (Cerro Gordo certainly at 630)
Cerro Gordo and Juniper Hill
690 below Cedar Valley

Top of Galena too high at Grinnell

MATERIAL SENT TO HINMAN FOR QUANTITATIVE ANALYSIS

Grinnell W-0151 T.D. 2500'

Intervals	
280 - 300	
330 - 350	
370 - 390	
440 - 460	
590 - 610	
680 - 690	
720 - 740	
800 - 820	
850 - 860	
920 - 940	
950 - 970	
1010 - 1030	
1080 - 1100	
1130 - 1150	
1170 - 1190	
1370 - 1390	
1420 - 1440	
1510 - 1530	
1630 - 1640	
1670 - 1690	
1760 - 1780	
1850 - 1870	
2000- 2020	
2060 - 2080	
2150 - 2160	
(2160 - 2170	missing)
2280 - 2300	
2380-- 2400	
2488 - 2500	

DEEP WELL STUDY

Well No. W— 0151
Depth 200 to 210
No. samples used 1
Analyst T & T
Date 8-20-34

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight	40 gm.	100.0%	2. Wt. of F. P. 2.25
3. Wt. after solution, with filter paper	16.38 gm.		
4. Less wt. F. P. (2)	2.25 gm.		
5. Wt. Insol. Residue (3 minus 4)	14.13 gm.	%	
6. Wt. lost by solution (1 minus 5)	25.87 gm.	64.67%	
7. To balance (5 plus 6)	40.00 gm.	%	

B. Subsidation:

1. Original Wt.	14.13 gm.	100.0%	
2. Cylinder (+1/32) 8.34, 4.72, 13.62	13.62 gm.	96.3%	
3. Jar (1/32—1/64) 2.24, 2.16, .08	0.08 gm.	.6%	
4. Drain	0.43 gm.	3.1%	

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2+1 mm	7.61	55.6
1–½ mm	2.47	18.0
½–¼ mm	1.76	12.9
¼–⅛ mm	1.04	7.6
⅛–1/16	.52	3.8
Pan	.29	2.1
Total	13.69	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform } 2.93± Sp. gr. Size–Grade(s) ¼–⅛ mm.

Analyst Rowser
Date Sept 8, 1934

Wt. of sample . . . . 1.81 gm. 100.0%

Heavy Minerals . . . . 1.02 gm. 2.5 %

Light Minerals . . . . 1.79 gm. 97.5 %

Shape Analysis:

A 2 %: a 21 %: C 61 %

r 16 %: R %.

Minerals Identified; Heavy Concentrate	No. of Grains	Rel. %
Pyrite	182	23.0
Hornblende	81	10.2
Barite	26	3.3
Zircon (zoned	20	2.6
unzoned	16	2.0
Tourmaline (Brown	6	.8
Green	8	1.0
garnet	8	1.0
pistacite	34	4.3
casing scale	410	52.0
Total	789	100%

Light Concentrate		
Quartz	431	52.3
clay	272	33.0
Feldspar	69	8.4
Muscavite	52	6.3
Total	824	100%

Classification Grouping:

Primary Minerals: 89.8 %	Absol. %
Quartz	51.0
clay	32.2
Muscovite	4.6
Hornblende	.3
zircon	.1
Tourmaline	.0
garnet	.0
pistacite	.1

Secondary Minerals: 10.2 %	
Feldspar	8.2
Pyrite	.6
Barite	.1
Casing Scale	1.3
Total	100%

Revised Lithologic Description (from descriptive log and laboratory data).

Limestone, 65%; hard, dense, lgt. gray to cream; SS; ±30%; size; 1-⅛, sec, max ½-¼; Pebbles from drift; 1-5%,

Feldspar all shows clastic centers with authigenic overgrowths.

DEEP WELL STUDY

Well No. W— 0151

Depth 220 to 230

No. samples used 1

Analyst T & T

Date 8-20-34

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1.	Sample weight	40 gm.	100.0%	2. Wt. of F. P. 2.22
3.	Wt. after solution, with filter paper	20.55 gm.		
4.	Less wt. F. P. (2)	2.22 gm.		
5.	Wt. Insol. Residue (3 minus 4)	18.33 gm.	45.8 %	
6.	Wt. lost by solution (1 minus 5)	21.67 gm.	54.2 %	
7.	To balance (5 plus 6)	40.00 gm.	100.0 %	

B. Subsidation:

1.	Original Wt.	18.33 gm.	100.0%	
2.	Cylinder (+1/32) 13.82, 2.29, 11.53	11.53 gm.	62.8 %	
3.	Jar (1/32—1/64) 4.73, 2.34	2.39 gm.	13.0 %	
4.	Drain 2.39	4.41 gm.	24.2 %	

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2+1 mm	2.90	25.7
1–½ mm	1.11	9.8
½–¼ mm	1.90	16.7
¼–⅛ mm	1.21	10.7
⅛–1/16	2.35	20.7
Pan	1.86	16.4
Total	11.33	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform 2.93+ Sp. gr. Size–Grade(s) ⅛–1/32 mm.

Analyst Rowser

Date Sept. 8, 1934

Wt. of sample 3.08 gm. 100.0%

Heavy Minerals .01 gm. .3 %

Light Minerals 3.07 gm. 99.7 %

Shape Analysis:

A ..... %: a ..... %: C ..... %

r ..... %: R ..... %.

Minerals Identified; Heavy Concentrate	No. of Grains	Rel. %
Leucoxene	537	92.8
Tourmaline Brown	43	5.8
Green	18	2.4
Blue	4	.5
Red	1	.1
Zircon Zoned	60	8.1
Zircon Unzoned	41	5.6
Garnet	10	1.4
Pistacite	2	.3
Pyrite	5	.7
Hornblende	10	1.4
Staurolite	3	.4
Kyanite	2	.3
Total	738	100%

Light Concentrate	No. of Grains	Rel. %
* Chert	424	40.7
†† Clay	313	30.1
Quartz	209	20.2
** Feldspar	92	8.9
Muscovite	1	.1
Total	1039	100%

Classification Grouping:

Primary Minerals: 50.3 %	Absol. %
Clay	30.0
Quartz	20.1
Muscovite	.1
Tourmaline	.0
Zircon	.1
Garnet	.0
Pistacite	.0
Hornblende	.0
Staurolite	.0

Secondary Minerals: 49.7 %	Absol. %
Chert	40.6
Feldspar	8.9
Leucoxene	.2
Pyrite	.0
Total	100%

Revised Lithologic Description (from descriptive log and laboratory data).

Limestone 54%; buff & yellowish sandy frag. of gray limestone, from 200-220; Sand 1-3%; well rounded & frosted; chert, ±20% in grease; silt ±20%; also some angular qtz, Feldspar, mica & pyrox. from the drift above. (Much of +1 grade is made up of this material.)

* chert very hard to distinguish from clay in the minute grains in this grade; some is oolitic; some seems to have replaced organic material.

** Feldspar is chiefly orthoclase or untwinned plagio, but there is some microcline; practically all grains show traces of authigenic growth.

†† - Quartz in grains which are, chiefly below 1/16, so no shape analysis is given, as nearly all are A.

DEEP WELL STUDY

Well No. W- 0151
Depth 230 to 240
No. samples used 1
Analyst T & T
Date 8-20-34

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight	40 gm.	100.0%	2. Wt. of F. P.	2.23
3. Wt. after solution, with filter paper	19.02 gm.			
4. Less wt. F. P. (2)	2.23 gm.			
5. Wt. Insol. Residue (3 minus 4)	16.77 gm.	41.92 %		
6. Wt. lost by solution (1 minus 5)	23.23 gm.	58.08 %		
7. To balance (5 plus 6)	40.00 gm.	100.0 %		

B. Subsidation:

1. Original Wt.	16.77 gm.	100.0%	
2. Cylinder (+1/32) 15.67 − 2.29 = 13.38 / 15.90	15.90 gm.	94.8 %	
3. Jar (1/32—1/64) 2.41 − 2.18 = 0.23	0.23 gm.	1.4 %	
4. Drain 0.23	0.64 gm.	3.8 %	

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2–1 mm	14.22	90.5
1–½ mm	.48	3.1
½–¼ mm	.27	1.7
¼–⅛ mm	.21	1.3
⅛–1/16	.25	1.6
Pan	.28	1.8
Total	15.71	100.0

S.G.D. not valid

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform } 2.93± Sp. gr. Size–Grade(s) 4 - 32 mm.

Analyst Rouser
Date Sept 10, 1934

Wt. of sample . . . . 0.80 gm. 100.0%

Heavy Minerals . . . . 0.005 gm. .6 %

Light Minerals . . . . 0.795 gm. 99.4 %

Shape Analysis:

A ..... %: a ..... %: C ..... %

r ..... %: R ..... %.

Minerals Identified; Heavy Concentrate	No. of Grains	Rel. %
Limonite	73	26.6
Casing scale	73	27.0
Pyrite	58	21.6
Leucoxene	38	14.0
Zircon Zoned	8	3.0
Unzoned	10	3.7
Pistacite	4	1.5
Hornblende	2	.7
Tourmaline Brown	3	1.1
Green	1	.4
Barite	1	.4
*	270	
Total		100%

Light Concentrate		
Clay	752	67.2
Chert	328	29.2
**Anhydrite	11	1.0
Quartz	21	1.9
Muscovite	8	.7
Total	1120	100%

Classification Grouping:

Primary Minerals: 65.4 %	Absol. %
Clay	66.8
Quartz	1.9
Muscovite	.7
Zircon	.0
Pistacite	.0
Hornblende	.0
Tourmaline	.0

Secondary Minerals: 0.6 %	
Limonite	.2
Pyrite	.1
Leucoxene	.1
Barite	.0
Chert	29.8
anhydrite	.2
casing scale	.2
Total	100%

Revised Lithologic Description (from descriptive log and laboratory data).

Limestone, 55%, wh. & brown, mixed, brown dolomitic, contains abundant fossil frag.; Chert, ±40%, grey, porous, replacing crinoid stems etc., in some instances; some shaft, ±10%; clay content ±10%.

* 270 equals nearly entire concentrate in slide.

** - Anhydrite in rounded, irregular masses, fine granular structure, giving microcrystalline appearance.

*** Chert is gry; rather porous, with some dense, grading into porous; openings are irregular in outline, with a few dolocasts.

DEEP WELL STUDY

Well No. W— 0151
Depth 240 to 250
No. samples used 1
Analyst T & T
Date 8-20-34

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight	40 gm.	100.0%	2. Wt. of F. P.	2.24
3. Wt. after solution, with filter paper	17.24 gm.			
4. Less wt. F. P. (2)	2.24 gm.			
5. Wt. Insol. Residue (3 minus 4)	15.00 gm.	37.5 %		
6. Wt. lost by solution (1 minus 5)	25.00 gm.	62.5 %		
7. To balance (5 plus 6)	40.00 gm.	100.0 %		

B. Subsidation:

1. Original Wt.	1.500 gm.	100.0%	
2. Cylinder (+1/32) 12.96, 2.32, 10.64	10.64 gm.	70.9 %	
3. Jar (1/32—1/64) 2.73, 2.31	.42 gm.	2.8 %	
4. Drain	3.94 gm.	26.3 %	

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2÷1 mm	3.26	31.6
1–½ mm	.91	8.8
½–¼ mm	1.68	16.3
¼–⅛ mm	1.64	15.9
⅛–1/16	1.65	16.0
Pan	1.18	11.4
Total	10.32	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform } 2.93± Sp. gr. Size–Grade(s) 1/8–1/32 mm.

Analyst Rowser
Date Sept. 10, 1934

Wt. of sample 1.45 gm. 100.0%

Heavy Minerals .01 gm. .7 %

Light Minerals 1.44 gm. 99.3 %

Shape Analysis:

A ....% : a ....% : C ....%

r ....% : R ....%.

Minerals Identified; Heavy Concentrate	No. of Grains	Rel. %
* Hornblende	562	47.0
Zircon	24	1.9
Tourmaline	37	3.1
Staurolite	27	2.3
Constante	13	1.0
Epidote	8	.7
Rutile	7	.6
Anatase	4	.3
Barite	2	.2
Limonite	12	1.0
Garnet	38	3.2
Augite	13	1.1
Leucoxene	14	1.2
Casing scale	176	14.7
Quartz	13	1.1
Total	1147	100%

Light Concentrate		
Clay	961	80.6
Quartz	135	11.3
Chert	59	5.0
* Feldspar	37	3.1
Total	1192	100%

Classification Grouping: Primary Minerals: 94.5 %	Absol. %
Clay	80.1
Quartz	11.2
Feldspar	3.1
Hornblende	.1
Zircon	.0
Tourmaline	.0
Staurolite	.0
Constante	.0
Epidote	.0
Rutile	.0
Augite	.0
Garnet	.0

Secondary Minerals: 5.5 %

Chert	5.0
Pyrite	.4
Anhydrite	.0
Barite	.0
Limonite	.0
Leucoxene	.0
Casing scale	.1
Total	100%

Revised Lithologic Description (from descriptive log and laboratory data).

Limestone, hard, clays, salt, gyp, contains 5-10% of hard Ls. frag. from above; Ls, ±5%; Chert, ±10%; gyp, some pieces, same as above; shale content ±25%; Drift, from above, 10-20% (Source at many heavy mineral)

* Hornblende very abundant, most in deep green fragments, but thin fragments are lighter colored; this mineral, together with some others probably came down from the drift.

** feldspar chiefly plagioclase, altered somewhat in most instances. Few if any show authigenic growths.

DEEP WELL STUDY

Well No. W- 0151
Depth 260 to 270
No. samples used 1
Analyst T & T
Date 6-20-34

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight	40 gm.	100.0% : 2. Wt. of F. P.	9.26
3. Wt. after solution, with filter paper	14.84 gm.		
4. Less wt. F. P. (2)	9.26 gm.		
5. Wt. Insol. Residue (3 minus 4)	12.58 gm.	31.4 %	
6. Wt. lost by solution (1 minus 5)	27.42 gm.	68.6 %	
7. To balance (5 plus 6)	40.00 gm.	100.0 %	

B. Subsidation:

1. Original Wt.	12.58 gm.	100.0%	
2. Cylinder (+1/32) 1.35 2.27 9.08	9.08 gm.	72.2 %	
3. Jar (1/32—1/64) 3.43 2.22 1.21	1.21 gm.	9.6 %	
4. Drain	2.29 gm.	18.2 %	

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2+1 mm	5.44	61.2
1–½ mm	1.48	16.7
½–¼ mm	1.05	11.8
¼–⅛ mm	.39	4.4
⅛–1/16	.28	3.2
Pan	.24	2.7
Total	8.88	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. **Bromoform** } 2.93± Sp. gr. Size–Grade(s) ¼-⅛ mm.

Analyst Rowser
Date Sept. 17

Wt. of sample 1.06 gm. 100.0%

Heavy Minerals .02 gm. 1.9 %

Light Minerals 1.04 gm. 98.1 %

Shape Analysis:

A ..... % : a ..... % : C ..... %

r ..... % : R ..... %.

Minerals Identified; Heavy Concentrate

	No. of Grains	Rel. %
Pyrite	1314	85.1
Hornblende	17	1.0
Limonite	19	1.2
Leucoxene	14	.9
Zircon	5	.3
Tourmaline	15	1.0
Rutile	2	.1
Barite	5	.2
Staurolite	3	.2
Tremolite	1	.1
anhydrite	8	.4
clay	123	8.0
Casing scale	18	1.2
Total	1543	**100%**

Light Concentrate

clay	956	90.4
Quartz	55	5.2
** chert	31	2.9
* Feldspar	16	1.5
Total	1058	100%

Classification Grouping:

Primary Minerals: 95.5 %

	Absol. %
	88.9
Clay	5.1
Quartz	1.5
Feldspar	.0
Hornblende	.0
Zircon	.0
Tourmaline	.0
staurolite	.0
Tremolite	

Secondary Minerals: 4.5 %

	2.9
Chert	1.6
Pyrite	.0
Limonite	.0
Leucoxene	.0
Barite	.0
anhydrite	.0
casing scale	
Total	100%

Revised Lithologic Description (from descriptive log and laboratory data).

Limestone, 68%; sl. sdy, soft, grey; Shale, content of ls, 10%; chert, 20%; white; dense; Quartz, 10%; angular frag. and some sand grains; chiefly from drift. Pyrite abundant.

* Feldspar shows no authigenic growth; is altered somewhat; is ±60% orthoclase;

** Chert grey; dense to porous; easily confused with lt. frag. in binox. study

DEEP WELL STUDY

Well No. W— 0151
Depth 280 to 300
No. samples used 2
Analyst T & T
Date 8-20-34

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight	45 gm.	100.0%	2. Wt. of F. P. 2.27
3. Wt. after solution, with filter paper	19.10 gm.		
4. Less wt. F. P. (2)	2.27 gm.		
5. Wt. Insol. Residue (3 minus 4)	16.83 gm.	37.3 %	
6. Wt. lost by solution (1 minus 5)	28.17 gm.	62.7 %	
7. To balance (5 plus 6)	45.00 gm.	100.0 %	

B. Subsidation:

1. Original Wt.	16.83 gm.	100.0%	
2. Cylinder (+1/32) 14.92, 2.32, 12.60	12.60 gm.	74.9%	
3. Jar (1/32—1/64) 3.63, 2.27, 1.36	1.36 gm.	8.1 %	
4. Drain 1.36	2.87 gm.	17.0 %	

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
1 mm	4.26	34.5
1–½ mm	1.30	10.5
½–¼ mm	1.41	11.4
¼–⅛ mm	2.02	16.2
⅛–1/16	1.97	15.8
Pan	1.45	11.6
Total	12.41	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Analyst Pawsey
Date Sept 11, 1934

Acet. Tetrabr. **Bromoform** ±2.93 Sp. gr. Size–Grade(s) ⅛–1/32 mm.

Wt. of sample 2.05 gm. 100.0%

Heavy Minerals .02 gm. 1.0 %

Light Minerals 2.03 gm. 99.0 %

Shape Analysis:

A ....% : a ....% : C ....%

r ....% : R ....%.

Minerals Identified; Heavy Concentrate

	No. of Grains	Rel. %
Pyrite	1592	77.7
Hornblende	233	11.5
Tourmaline, Brown	14	.6
Tourmaline, Green	5	.2
Tourmaline, Blue	1	.1
Zircon, Zoned	36	1.7
Zircon, Plain	18	.9
Titanite	29	1.4
Garnet	6	.3
Enstatite	6	.3
Barite	26	1.3
Staurolite	19	.9
Epidote	3	.1
Rutile	1	.1
Anhydrite	5	.2
Casing Scale	1	.1
Tremolite	54	2.6
Total	2047	100%

Light Concentrate

Clay	881	73.7
Chert	132	10.9
Quartz	97	8.2
Feldspar	84	7.0
Glauconite	3	.2
Total	1207	100%

Classification Grouping:

Primary Minerals: 88.4 %

	Absol. %
Clay	73.0
Quartz	8.1
Feldspar	7.0
Hornblende	.1
Tourmaline	.1
Zircon	.0
Titanite	.0
Garnet	.0
Enstatite	.0
Barite	.0
Staurolite	.0
Epidote	.0
Rutile	.0
Glauconite	.2

Secondary Minerals: 11.6 %

Chert	10.8
Pyrite	.8
Anhydrite	.0
Casing Scale	.0
Total	100%

Revised Lithologic Description (from descriptive log and laboratory data).

Limestone, 63%; shy; gray. Chert 10–15%; gry to wh; dense; replacing organic forms in some cases; Quartz, 1–5%; chiefly from drift; shale—5–10%; Pyrite abundant; some drift present in sample from above.

* Hornblende & other amphiboles + pyroxenes probably came from the small amt. of driftwhich is present in sample.

** Feldspar is chiefly orthoclase, little or no authigenic growths.

DEEP WELL STUDY

Well No. W— 0151
Depth 300 to 320
No. samples used 2
Analyst T & T
Date 8-30-34

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight	45- gm.	100.0%	2. Wt. of F. P.	2.23
3. Wt. after solution, with filter paper	16.79 gm.			
4. Less wt. F. P. (2)	2.23 gm.			
5. Wt. Insol. Residue (3 minus 4)	14.56 gm.	32.4 %		
6. Wt. lost by solution (1 minus 5)	30.44 gm.	67.6 %		
7. To balance (5 plus 6)	45.00 gm.	100.0 %		

B. Subsidation:

1. Original Wt.	14.56 gm.	100.0%	
2. Cylinder (+1/32) 14.33, 2.20, 12.13	12.13 gm.	83.4 %	
3. Jar (1/32—1/64) 300, 2.18	0.82 gm.	5.6 %	
4. Drain 0.82	1.61 gm.	11.0 %	

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2–1 mm	4.29	34.6
1–½ mm	1.78	14.4
½–¼ mm	2.51	20.3
¼–⅛ mm	1.50	12.1
⅛–1/16	1.17	9.5
Pan	1.12	9.1
Total	12.37	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform } 2.93+ Sp. gr. Size–Grade(s) 1/8 - 1/32 mm.

Analyst Rowser
Date Sept 13, 1934

Wt. of sample . . . . 1.72 gm. 100.0%

Heavy Minerals . . . . .01 gm. .6 %

Light Minerals . . . . 1.71 gm. 99.4 %

Shape Analysis:

A ..... %: a ..... %: C ..... %

r ..... %: R ..... %.

Minerals Identified; Heavy Concentrate

	No. of Grains	Rel. %
Pyrite	763	75.3
Hornblende	121	11.9
Pistacite	17	1.7
* Hypersthene	9	.9
Garnet	7	.7
Zircon Rounded	15	1.6
Tourmaline Green	4	1.0
Tourmaline Brown	3	.3
Rutile	2	.2
Spinel	1	.1
** Tremolite	4	.4
Fluorite	1	.1
Casing Scale	6	.6
Total	1013	100%

Light Concentrate

Clay	380	45.6
Chert	245	29.4
*** Unknown	144	17.3
Quartz	23	2.8
Quartzite	18	2.2
Feldspar	17	2.0
Glauconite	6	.7
Total	833	100%

Classification Grouping:

	Absol. %
Primary Minerals: 50.5 %	
Clay	45.4
Quartz	2.8
Quartzite	2.2
Hornblende	.1
Pistacite	.0
Garnet	.0
Zircon	.0
Tourmaline	.0
Rutile	.0
Spinel	.0
Tremolite	.0
Secondary Minerals: 49.5 %	
Chert	29.2
Unknown	17.1
Feldspar	2.0
Glauconite	.7
Pyrite	.5
* Fluorite	.0
Casing Scale	.0
Total	100%

Revised Lithologic Description (from descriptive log and laboratory data).

Limestone, 62.6%; lt. gray to cream, slightly clay, chert 15-20%, Quartz fresh, angular, 10-20%; Sh. 5-10%; Some frag. of dk. ft. Pyrite Lig.

* Hypersthene, tremolite & hornblende probably from the drift fragments which are present in sample.

** Flourite in very minute grains, sample to be re-treated

*** unknown - , in tights; isotropic, colorless; n = ±1.447

DEEP WELL STUDY

Well No. W— 0151
Depth 330 to 350
No. samples used 2
Analyst T & T
Date 8-20-34

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight	45 gm.	100.0%	2. Wt. of F. P.	2.25
3. Wt. after solution, with filter paper	8.53 gm.			
4. Less wt. F. P. (2)	2.25 gm.			
5. Wt. Insol. Residue (3 minus 4)	6.28 gm.	14.0 %		
6. Wt. lost by solution (1 minus 5)	38.72 gm.	86.0 %		
7. To balance (5 plus 6)	45.00 gm.	100.0 %		

B. Subsidation:

1. Original Wt.	6.28 gm.	100.0%	
2. Cylinder (+1/32) 8.19, 2.28, 5.91	5.91 gm.	94.1 %	
3. Jar (1/32—1/64) 2.22, 2.21, .01	0.01 gm.	.2 %	
4. Drain	0.36 gm.	5.7 %	

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2–1 mm	1.63	27.5
1–½ mm	1.87	30.7
½–¼ mm	1.16	19.7
¼–⅛ mm	.57	9.6
⅛–1/16 "	.41	6.9
Pan	.33	5.6
Total	5.92	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Analyst Rimm
Date Sept 9-34

Acet. Tetrabr. **Bromoform** 2.93± Sp. gr. Size–Grade(s) ¼–1/32 mm.

Wt. of sample 1.31 gm. 100.0%

Heavy Minerals 0.02 gm. 1.5 %

Light Minerals 1.29 gm. 98.5 %

Shape Analysis:

A ..... %: a ..... %: C ..... %

r ..... %: R ..... %.

Minerals Identified; Heavy Concentrate	No. of Grains	Rel. %
Pyrite	118	8.6
Hornblende	86	5.9
Zircon Zoned	24	1.6
Zircon Brown	12	.8
Tourmaline Brown	6	.4
Tourmaline Green	5	.3
Pistacite	10	.7
Hypersthene	19	1.3
Tremolite	5	.4
Titanite	7	.5
Garnet	1	.1
Olivene(?)	1	.1
Rutile	6	.4
Casing scale	125	8.8
Total	1467	100%

Light Concentrate		
Clay	660	54.0
Quartz	125	10.3
Gypsum	114	9.4
Chert	280	23.0
Feldspar	40	3.3
Total	1219	100%

Classification Grouping:

Primary Minerals: 66.6 %

	Absol. %
Clay	53.2
Quartz	10.1
Feldspar	3.2
Hornblende	.1
Zircon	.0
Tourmaline	.0
Pistacite	.0
Hypersthene	.0
Tremolite	.0
Titanite	.0
Garnet	.0
Olivene	.0
Rutile	.0

Secondary Minerals: 33.4 %

Gypsum	9.3
Chert	22.7
Pyrite	1.3
Casing scale	.1
Total	100%

Revised Lithologic Description (from descriptive log and laboratory data).

Limestone, 86%, light gray, shiny calcite 5–10% in paint masses; sandstone, is well rounded quartz, chert, 30–40%, glassy, loose, Si content ±10%; gypsum—4%.

DEEP WELL STUDY

Well No. W- 015-1
Depth 370 to 390
No. samples used 2
Analyst T & T
Date 6-20-34

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight	45 gm.	100.0%	2. Wt. of F. P.	2.24
3. Wt. after solution, with filter paper	11.24 gm.			
4. Less wt. F. P. (2)	2.24 gm.			
5. Wt. Insol. Residue (3 minus 4)	9.00 gm.	20.0 %		
6. Wt. lost by solution (1 minus 5)	36.00 gm.	80.0 %		
7. To balance (5 plus 6)	45.00 gm.	100.0 %		

B. Subsidation:

1. Original Wt.	9.00 gm.	100.0%	
2. Cylinder (+1/32) 18.87 − 9.28 = 9.59	8.59 gm.	95.5 %	
3. Jar (1/32—1/64) 2.39 − 2.37	0.02 gm.	.2 %	
4. Drain	0.39 gm.	4.3 %	

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2+1 mm	3.38	39.0
1–½ mm	1.88	21.7
½–¼ mm	1.50	17.3
¼–⅛ mm	.96	11.1
⅛–1/16	.52	6.0
Pan	.42	4.9
Total	8.66	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Analyst Rowser
Date Sept 13, 1934

Acet. Tetrabr. **Bromoform** 2.93 Sp. gr. Size–Grade(s) ¼–1/32 mm.

Wt. of sample 1.80 gm. 100.0%

Heavy Minerals .04 gm. 2.2 %

Light Minerals 1.76 gm. 97.8 %

Shape Analysis:

A ..... %: a ..... %: C ..... %

r ..... %: R ..... %.

Minerals Identified: Heavy Concentrate	No. of Grains	Rel. %
Pyrite	1319	97.8
Barite	10	.7
Hornblende	5	.4
Tourmaline (brown)	3	.2
Zircon	1	.1
Pisacite	2	.2
casing scale	8	.6
Total	1348	100%

Light Concentrate		
chert	712	53.2
clay	524	39.0
Quartz	78	5.8
Feldspar	6	.4
gypsum	6	.4
? Unknown No. 1	14	1.0
? Unknown #2	2	.2
Total	1342	100%

Classification Grouping:

Primary Minerals: 44.2 %	Absol. %
Clay	38.1
Quartz	5.7
Feldspar	.4
Hornblende	.0
Tourmaline	.0
Zircon	.0
Pisacite	

Secondary Minerals: 55.8 %	
chert	52.0
gypsum	.4
Calcite	.0
Pyrite	2.2
Unknown	1.2
Total	100%

Revised Lithologic Description (from descriptive log and laboratory data).

Limestone, 80%; light gray to white; Chert, 10%; gray; dense; Shale, 10%; dk gray to blk; Quartz, 10%; Pyrite abundant; Gypsum - a trace.

(1) unknown No 1 – index = ±1.447; sp.g. <2.93; isotropic; sample gives test for F.; may be source of this element. In rounded masses.

(2) unknown – isotropic; N = ± 1.5-3; 1 cleavage; has inclusions of zircon.

DEEP WELL STUDY

Well No. W—0157
Depth 390 to 410
No. samples used 2
Analyst J & T
Date 8-20-34

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight	45 gm.	100.0%	2. Wt. of F. P.	2.31
3. Wt. after solution, with filter paper	35.62 gm.			
4. Less wt. F. P. (2)	2.31 gm.			
5. Wt. Insol. Residue (3 minus 4)	33.31 gm.	74.0 %		
6. Wt. lost by solution (1 minus 5)	11.69 gm.	26.0 %		
7. To balance (5 plus 6)	45.00 gm.	100.0 %		

B. Subsidation:

1. Original Wt.	33.31 gm.	100.0%	
2. Cylinder (+1/32) 26.32 + 2.27	24.05 gm.	72.3 %	
3. Jar (1/32—1/64) 6.93 + 2.34	4.59 gm.	13.7 %	
4. Drain	4.67 gm.	14.0 %	

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2÷1 mm	.78	2.4
1–½ mm	.04	4.4
½–¼ mm	1.03	4.3
¼–⅛ mm	1.41	5.9
⅛–1/16	4.71	19.7
Pan	14.02	58.3
Total	24.05	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform } 2.93+ Sp. gr. Size–Grade(s) ¼–1/30 mm.

Analyst Rowser
Date 9-13-34

Wt. of sample . . . . 3.69 gm. 100.0%

Heavy Minerals . . . . .02 gm. .5 %

Light Minerals . . . . 3.67 gm. 99.5 %

Shape Analysis:

A ..... %: a ..... %: C ..... %

r ..... %: R ..... %.

Minerals Identified; Heavy Concentrate	No. of Grains	Rel. %
Pyrite	595	18.0
Tourmaline Brown	39	4.5
Tourmaline green	36	3.4
Tourmaline Blue	6	.7
Zircon Zoned	32	3.6
Zircon Unzoned	36	4.1
Hornblende	29	3.0
Barite	4	.5
Rutile	2	.2
Garnet	34	3.2
Quartz	64	7.3
Staurolite	3	.3
Anatase	1	.1
Casing scale	2	.2
Total	875	100%
Light Concentrate		
** Quartz	1220	67.3
Feldspar	496	27.4
Clay	95	5.3
Total	1811	100%

Classification Grouping:

Primary Minerals: 72.4 %	Absol. %
Quartz	67.0
Clay	5.3
Tourmaline	.1
Zircon	.0
Hornblende	.0
Rutile	.0
Garnet	.0
Staurolite	.0
Anatase	.0

Secondary Minerals: 27.6 %	
Feldspar	27.3
Pyrite	.3
Barite	.0
Casing scale	.0
Total	100%

Revised Lithologic Description (from descriptive log and laboratory data).

Siltstone ±100% lgt gry; soft; slty, soluble; Quartz, ±7% in very minute fragments = (¼–1/30)

** Feldspar - chiefly orthoclase, or untwinned plagio; Microcline - ±10%; all show very narrow margins of authigenic growth;

DEEP WELL STUDY

Well No. W— 0151

Depth 410 to 426

No. samples used 1

Analyst T+T

Date 8-20-34

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight	35 gm.	2. Wt. of F. P.	2.27
3. Wt. after solution, with filter paper	19.89 gm.		
4. Less wt. F. P. (2)	2.27 gm.		
5. Wt. Insol. Residue (3 minus 4)	17.62 gm.	50.4	%
6. Wt. lost by solution (1 minus 5)	17.38 gm.	49.6	%
7. To balance (5 plus 6)	35.00 gm.	100.0	%

B. Subsidation:

1. Original Wt.		17.62 gm.	100.0	%
2. Cylinder (+1/32)	10.06, 9.33, 7.73	7.73 gm.	43.9	%
3. Jar (1/32—1/64)	5.40, 2.23	3.17 gm.	18.0	%
4. Drain	3.17	6.72 gm.	38.1	%

C. Screen Analysis

SIZE	GRAMS	%	
2 plus			
2–1 mm			
1–½ mm	.21	2.9	S.G.D. not Valid
½–¼ mm	.35	4.8	
¼–⅛ mm	3.38	46.3	
⅛–1/16	2.36	32.2	
Pan	1.02	13.8	
Total	7.32	100.0	

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform } 2.93± Sp. gr. Size–Grade(s) 1/8-1/16 mm.

Analyst Rowser

Date Sept 17, 1934

Wt. of sample . . . . 1.22 gm. 100.0%

Heavy Minerals . . . . .01 gm. .6 %

Light Minerals . . . . 1.76 gm. 99.4 %

Shape Analysis:

A ..... %: a ..... %: C ..... %

r ..... %: R ..... %.

Minerals Identified; Heavy Concentrate	No. of Grains	Rel. %
Pyrite	398	59.9
Hornblende	20	3.0
Tourmaline Brown	8	1.2
Tourmaline green	8	1.2
Zircon Zoned	2	.3
Zircon Unzoned	6	.9
Barite	10	1.5
Garnet	4	.6
Casing Scale	208	31.4
Total	664	100%

Light Concentrate		
Clay	1260	75.6
Quartz	348	21.0
Feldspar	56	3.4
Total	1664	100%

Classification Grouping:

Primary Minerals: 96 %	Absol. %
Clay	75.0
Quartz	21.0
Hornblende	.0
Tourmaline	.0
Zircon	.0
Garnet	.0

Secondary Minerals: 4.0 %	
Feldspar	3.4
Pyrite	.4
Barite	.0
Casing Scale	.2
Total	100%

Revised Lithologic Description (from descriptive log and laboratory data).

Shale; very calcareous (49% Soluble) w/a trace of Some calcite in minute rhombs; Quartz 30-40% in ½-¼ size; Pyrite 2%.

Feldspar in minute grains showing a narrow fringe of authigenic growth - chiefly orthoclase or untwinned plagioclase.

DEEP WELL STUDY

Well No. W-- 015-1
Depth 430 to 440
No. samples used 1
Analyst T+T
Date 8-20-34

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight	35 gm.	100.0% : 2. Wt. of F. P.	2.20
3. Wt. after solution, with filter paper	17.13 gm.		
4. Less wt. F. P. (2)	2.20 gm.		
5. Wt. Insol. Residue (3 minus 4)	14.93 gm.	42.6 %	
6. Wt. lost by solution (1 minus 5)	20.07 gm.	57.4 %	
7. To balance (5 plus 6)	35.00 gm.	100.0 %	

B. Subsidation:

1. Original Wt.	14.93 gm.	100.0%	
2. Cylinder (+1/32) 9.40 / 2.23 / 7.17	7.17 gm.	48.2%	
3. Jar (1/32—1/64) 3.40 / 2.32 / 1.08	1.08 gm.	7.2 %	
4. Drain	6.68 gm.	44.6 %	

C. Screen Analysis

SIZE	GRAMS	%	
2 plus			3.60 not valid
2+1 mm	.20	2.8	
1–½ mm	.30	4.2	
½–¼ mm	1.70	23.9	
¼–⅛ mm	1.42	20.0	
⅛–1/16	2.09	29.4	
Pan	1.40	19.7	
Total	7.11	100.0	

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform 2.93± Sp. gr. Size–Grade(s) ⅛-1/32 mm.

Analyst Rowse
Date 9/17/34

Wt. of sample 2.01 gm. 100.0%

Heavy Minerals 0.01 gm. .5 %

Light Minerals 2.00 gm. 99.5 %

Shape Analysis:

A ..... % : a ..... % : C ..... %

r ..... % : R ..... %.

Minerals Identified; Heavy Concentrate

	No. of Grains	Rel. %
† Pyrite	67	6.7
Hornblende	67	6.7
*Quartz	89	8.9
casing scale	91	9.1
Barite	1	.1
Zircon [pitted	16	1.6
Zircon [unpitted	4	.4
garnet	3	.3
Tourmaline [green	3	.3
Tourmaline [brown	3	.3
Tourmaline [blue	1	.1
Pistacite	4	.4
Staurolite	3	.3
*clay	61	6.1
Total	100	100%

Light Concentrate

clay	808	88.7
Quartz	82	9.0
Feldspar	21	2.3
Total	911	100%

Classification Grouping:

Primary Minerals: 97.3 %

	Absol. %
clay	88.3
Quartz	9.0
Hornblende	.0
Zircon	.0
garnet	.0
Tourmaline	.0
Pistacite	.0
Staurolite	.0

Secondary Minerals: 2.7 %

Feldspar	2.3
Pyrite	.3
Barite +	.0
casing scale,	.1
Total	100%

Revised Lithologic Description (from descriptive log and laboratory data).

limestone, 57.0%; light gray, very shy; shale content 40%; dolomite 5-10%; in pink & brown masses, and 10%; Pyritiferous; (sample originally described as a calcareous shale)

* Quartz + clay brought down into heavies by pyrite.

** Feldspar, (orthoclase ≠60%) shows ~~a very~~ very thin margins of authigenic growth on all grains.

† Hornblende in fresh, bright green cleavage fragments; only one or two show any rounding — may have come from contamination of sample by drift caving in.

DEEP WELL STUDY

Well No. W— 0151
Depth 440 to 460
No. samples used 2
Analyst T+T
Date 8-20-34

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight	40 gm.	100.0%	2. Wt. of F. P. 2.19
3. Wt. after solution, with filter paper	20.00 gm.		
4. Less wt. F. P. (2)	2.19 gm.		
5. Wt. Insol. Residue (3 minus 4)	17.81 gm.	44.4 %	
6. Wt. lost by solution (1 minus 5)	22.19 gm.	55.6 %	
7. To balance (5 plus 6)	40.00 gm.	100.0 %	

B. Subsidation:

1. Original Wt.	17.81 gm.	100.0%	
2. Cylinder (+1/32) 12.83, 2.35	10.48 gm.	58.8 %	
3. Jar (1/32—1/64) 4.52, 2.33	2.19 gm.	12.3 %	
4. Drain	5.14 gm.	28.9 %	

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
1+1 mm	.62	6.0
1–½ mm	.61	5.9
½–¼ mm	2.07	20.0
¼–⅛ mm	2.25	21.8
⅛–1/16	2.74	26.4
Pan	2.06	19.9
Total	10.35	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Analyst Rowser
Date Sept. 17, 1934

Acet. Tetrabr. / Bromoform } ±2.93 Sp. gr. Size–Grade(s) 1/8–1/32 mm.

Wt. of sample 2.00 gm. 100.0%
Heavy Minerals .01 gm. .5 %
Light Minerals 1.99 gm. 99.5 %

Shape Analysis:
A ..... %: a ..... %: C ..... %
r ..... %: R ..... %.

Minerals Identified; Heavy Concentrate

	No. of Grains	Rel. %
Pyrite	683	77.3
Barite	40	4.5
** Hornblende	32	3.6
Zircon [zoned	7	.8
Zircon [unzoned	8	.9
Tourmaline [Brown	4	.5
Tourmaline [green	2	.2
Garnet	3	.3
Tremolite	1	.1
Pistacite	1	.1
Casing Scale	104	11.8
Total	884	100%

Light Concentrate

Clay	1218	94.7
Quartz	42	3.3
* Feldspar	26	2.0
Total	1286	100%

Classification Grouping:

Primary Minerals: 97.5 %	Absol. %
Clay	94.2
Quartz	3.3
Hornblende	.0
Zircon	.0
Tourmaline	.0
Garnet	.0
Tremolite	.0
Pistacite	.0

Secondary Minerals: 2.5 %	
Feldspar	2.0
Pyrite	.4
Barite	.0
Casing Scale	.1
Total	100%

Revised Lithologic Description (from **descriptive log** and laboratory data).

Shale; trace; very calcareous (easily soluble) light gray to dk. gray; Dolomite ±10% - pink to brown xl aggregates, Quartz ±10% in angular frags. a few rounded sub grains, Pyrite, abundant; chert, a trace (in larger grades)

* Feldspar is in very minute fragments; is fiery, orthoclase or untwinned plagioclase. (latter may well be the case, as frag. are so small.) all show traces of authigenic growth

** Hornblende in fresh, angular cleavage fragments,

DEEP WELL STUDY

Well No. W— 0151

Depth 460 to 480

No. samples used 2

Analyst T + T

Date 6-20-34

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight	40 gm.	100.0%	2. Wt. of F. P. 2.25
3. Wt. after solution, with filter paper	25.82 gm.		
4. Less wt. F. P. (2)	2.25 gm.		
5. Wt. Insol. Residue (3 minus 4)	23.57 gm.	58.8 %	
6. Wt. lost by solution (1 minus 5)	16.43 gm.	41.2 %	
7. To balance (5 plus 6)	40.00 gm.	100.0 %	

B. Subsidation:

1. Original Wt.	23.57 gm.	100.0%	
2. Cylinder (+1/32) 12.13 + 4.66 = 17.47	17.47 gm.	74.2 %	
3. Jar (1/32—1/64) 4.10 − 2.40	1.70 gm.	7.2 %	
4. Drain 1.70	4.40 gm.	18.6 %	

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2–1 mm	3.62	20.7
1–½ mm	1.12	6.4
½–¼ mm	2.74	15.7
¼–⅛ mm	3.87	22.3
⅛–1/16	3.57	20.4
Pan	2.53	14.5
Total	17.45	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Analyst Rouser

Date Sept 17, 1934

Acet. Tetrabr. Bromoform 2.93+ Sp. gr. Size–Grade(s) ⅛–1/32 mm.

Wt. of sample 2.01 gm. 100.0%

Heavy Minerals .01 gm. .5 %

Light Minerals 2.00 gm. 99.5 %

Shape Analysis:

A ..... %: a ..... %: C ..... %

r ..... %: R ..... %.

Minerals Identified; Heavy Concentrate	No. of Grains	Rel. %
Pyrite	781	81.5
Barite	5	.5
Hornblende	2	.2
Zircon zoned	3	.3
Zircon unzoned	2	.2
Tourmaline Brown	2	.2
Tourmaline Green	3	.3
garnet	2	.2
clay	160	16.6
Total	960	100%

Light Concentrate			
	Clay	960	91.1
	Quartz	61	5.9
*	Feldspar	32	3.0
Total		1053	100%

Classification Grouping:

Primary Minerals: 96.6 %

	Absol. %
Clay	90.7
Quartz	5.9
Hornblende	.0
Zircon	.0
Tourmaline	.0
garnet	.0

Secondary Minerals: 3.4 %

Feldspar	3.0
Pyrite	.4
Barite	.0
Total	100%

Revised Lithologic Description (from descriptive log and laboratory data).

Shale, 60%, dk gray, calcareous; Dolomite, tan, pink to brown, impure, probably interbedded with shale; Pyrite, <1%

* Feldspar is in the fragments; show traces of authigenic growth.

DEEP WELL STUDY

Well No. W-- 0151
Depth 480 to 520
No. samples used 2
Analyst T & T
Date 8-20-34

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight	46 gm.	100.0%	2. Wt. of F. P. 2.24
3. Wt. after solution, with filter paper	31.00 gm.		
4. Less wt. F. P. (2)	2.24 gm.		
5. Wt. Insol. Residue (3 minus 4)	28.76 gm.	71.9 %	
6. Wt. lost by solution (1 minus 5)	11.24 gm.	28.1 %	
7. To balance (5 plus 6)	40.00 gm.	100.0 %	

B. Subsidation:

1. Original Wt.	28.76 gm.	100.0%	
2. Cylinder (+1/32) 18.34 + 2.26 = 16.08	16.08 gm.	56.0 %	
3. Jar (1/32—1/64) 6.67 + 1.33 = 4.34	4.34 gm.	15.0 %	
4. Drain 4.34	8.34 gm.	29.0 %	

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2+1 mm	4.05	25.7
1–½ mm	.81	5.1
½–¼ mm	.71	4.5
¼–⅛ mm	2.49	15.7
⅛–1/16	3.72	23.5
Pan	4.03	25.5
Total	15.81	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. **Bromoform** } ±2.93 Sp. gr. Size–Grade(s) ⅛–1/32 mm.

Analyst Rowsey
Date Sept 17, 1934

Wt. of sample . . . . 2.02 gm. 100.0%

Heavy Minerals . . . . .01 gm. .5 %

Light Minerals . . . . 2.01 gm. 99.5 %

Shape Analysis:

A ..... %: a ..... %: C ..... %

r ..... %: R ..... %.

Minerals Identified; Heavy Concentrate

	No. of Grains	Rel. %
Pyrite	67	97.1
Tourmaline		.1
Hornblende		.1
Barite		.1
Casing Scale	18	2.6
Total	692	100%

Light Concentrate

Clay	1036	91.5
Quartz	72	6.5
Feldspar	23	2.0
Total	1131	100%

Classification Grouping:

Primary Minerals: 97.5 %

	Absol. %
Clay	91.0
Quartz	6.5
Tourmaline	.0
Hornblende	.0

Secondary Minerals: 2.5 %

Feldspar	2.0
Pyrite	.5
Barite	.0
Casing Scale	.0
Total	100%

Revised Lithologic Description (from descriptive log and laboratory data).

Shale; 85-90%; calcareous (±20% soluble) dark gray; hard when dry; does not soak up readily; dolomite 5-10%; pinkish brown; Pyrite a trace; Quartz, ±1%.

DEEP WELL STUDY

Well No. W— 0151
Depth 520 to 540
No. samples used 2
Analyst T+T
Date 8-20-34

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight	40 gm.	100.0%	2. Wt. of F. P.	2.25
3. Wt. after solution, with filter paper	33.90 gm.			
4. Less wt. F. P. (2)	2.25 gm.			
5. Wt. Insol. Residue (3 minus 4)	31.65 gm.	79.1 %		
6. Wt. lost by solution (1 minus 5)	8.35 gm.	20.9 %		
7. To balance (5 plus 6)	40.00 gm.	100.0 %		

B. Subsidation:

1. Original Wt.	31.65 gm.	100.0%	
2. Cylinder (+1/32) 13.08 − 2.29 = 10.79	10.79 gm.	34.2%	
3. Jar (1/32—1/64) 7.03 − 2.33 = 4.70	4.70 gm.	14.8 %	
4. Drain 4.70	1.16 gm.	5.1.0 %	

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2+1 mm	.82	7.7
1–½ mm	.44	4.1
½–¼ mm	.78	7.3
¼–⅛ mm	1.70	16.0
⅛–1/16	3.38	31.7
Pan	3.54	33.2
Total	10.66	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform 2.93+ Sp. gr. Size–Grade(s) ⅛-¼ mm.

Analyst Bowser
Date Sept 18 1934

Wt. of sample 2.90 gm. 100.0%

Heavy Minerals .02 gm. .7 %

Light Minerals 2.88 gm. 99.3 %

Shape Analysis:

A ....%: a ....%: C ....%

r ....%: R ....%.

Minerals Identified; Heavy Concentrate	No. of Grains	Rel. %
*Pyrite	756	71.5
Barite	11	1.0
clay	201	19.0
Zircon	2	.2
Tourmaline Green	4	.4
Tourmaline Brown	4	.4
Pistacite	1	.1
Hornblende	2	.2
Casing Scale	76	7.2
Total	1057	100%

Classification Grouping:

Primary Minerals: 99.4 %	Absol. %
clay	85.0
Quartz	10.9
Feldspar	3.5
Zircon	.0
Tourmaline	.0
Pistacite	.0
Hornblende	.0

Light Concentrate		
clay	872	85.5
Quartz	113	11.0
*Feldspar	36	3.5
Total	1021	100%

Secondary Minerals: .6 %

Pyrite	.5
Barite	.0
Casing Scale	.1
Total	100%

Revised Lithologic Description (from descriptive log and laboratory data).

Shale, dk gy, calcareous, (20% soluble) very little gritty substances; smooth, greasy feel; a small amt of Quartz in silt size, some pyrite.

* Pyrite chiefly in small xls, included in shale aggregates - hence the presence of clay in heavy concentrate.

* Feldspar in minute, clastic grains.

DEEP WELL STUDY

Well No. W— 0151

Depth 540 to 560

No. samples used 2

Analyst T+T

Date 6-20-34

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight	40 gm.	100.0%	2. Wt. of F. P. 2.25
3. Wt. after solution, with filter paper	25.11 gm.		
4. Less wt. F. P. (2)	2.25 gm.		
5. Wt. Insol. Residue (3 minus 4)	22.86 gm.	57.1 %	
6. Wt. lost by solution (1 minus 5)	17.14 gm.	42.9 %	
7. To balance (5 plus 6)	40.00 gm.	100.0 %	

B. Subsidation:

1. Original Wt.	22.86 gm.	100.0%	
2. Cylinder (+1/32) 9.34 2.33 7.01	7.01 gm.	30.6 %	
3. Jar (1/32—1/64) 6.35 2.21	4.14 gm.	18.1 %	
4. Drain 4.14	11.71 gm.	51.3 %	

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
1 mm	1.14	16.6
1–½ mm	.31	4.5
½–¼ mm	.74	10.7
¼–⅛ mm	.90	13.1
⅛–1/16	1.65	24.0
Pan	2.14	31.1
Total	6.88	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. ~~Bromoform~~ 2.937 Sp. gr. Size–Grade(s) 1/6–1/32 mm.

Analyst Rowser

Date Sept 17 1934

Wt. of sample 2.98 gm. 100.0%

Heavy Minerals 102 gm. 7 %

Light Minerals 2.96 gm. 99.3 %

Shape Analysis:

A ..... %: a ..... %: C ..... %

r ..... %: R ..... %.

Minerals Identified; Heavy Concentrate	No. of Grains	Rel. %
* Pyrite Marcasite	742	97.8
Barite	10	1.3
Free Sulphur	3	.4
Hornblende	3	.4
Tourmaline	1	.1
Total	759	100%

Classification Grouping:

Primary Minerals: 98.5 %

Absol. %	
Clay	94.5
Quartz	3.9
Hornblende	.0
Tourmaline	.0
Muscovite	.1

Light Concentrate		
Clay	1125	95.2
Quartz	46	3.9
** Feldspar	9	.8
Muscovite	1	.1
Total	1181	100%

Secondary Minerals: 1.5 %

Feldspar	.8
Pyrite & Marcasite	.7
Barite	.0
Sulphur	.0
Total	100%

Revised Lithologic Description (from descriptive log and laboratory data).

Shale, calcareous; (43% soluble) lgt. gry; a few frag. of brown l.s.; Quartz, ±1% in grains ⅛–1/32; pyrite <1%.

* There are probably two sulphides present - Pyrite and Marcasite, but the two are very hard to separate. Some is in rounded masses; some replace fossils - i.e. bryozoa; in some grains the silver gray & brass yellow are both present, on different parts of grain. The presence of marcasite probably accounts for the free sulphur present in slide.

** Feldspar in minute grains of orthoclase or untwinned plagio. with very narrow bands of authigenic growth.

DEEP WELL STUDY

Well No. W— 0151
Depth 560 to 580
No. samples used 2
Analyst TLT
Date 8-26-34

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight	40 gm.	100.0%	2. Wt. of F. P. 2.24
3. Wt. after solution, with filter paper	16.60 gm.		
4. Less wt. F. P. (2)	2.24 gm.		
5. Wt. Insol. Residue (3 minus 4)	14.36 gm.	35.9 %	
6. Wt. lost by solution (1 minus 5)	25.64 gm.	64.1 %	
7. To balance (5 plus 6)	40.00 gm.	100.0 %	

B. Subsidation:

1. Original Wt.	14.36 gm.	100.0%	
2. Cylinder (+1/32) 7.96, 2.27, 5.69	5.69 gm.	39.6%	
3. Jar (1/32—1/64) 4.80, 2.38, 2.42	2.42 gm.	16.9 %	
4. Drain	6.25 gm.	43.5 %	

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm	1.18	21.0
¼–⅛ mm		
⅛–1/16	4.41	79.0
Pan		
Total	5.59	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Analyst Rowsey
Date Sept. 19, 1934

Acet. Tetrabr. ~~Bromoform~~ 2.93± Sp. gr. Size–Grade(s) ¼–1/32 mm.

Wt. of sample 2.08 gm. 100.0%

Heavy Minerals .03 gm. 1.4 %

Light Minerals 2.05 gm. 98.6 %

Shape Analysis:

A ..... %: a ..... %: C ..... %

r ..... %: R ..... %.

Minerals Identified; Heavy Concentrate	No. of Grains	Rel. %
Pyrite	916	79.4
Feldspar	23	2.0
clay	15-6	13.5
quartz	34	2.9
	1	.1
garnet	1	.1
Hornblende	5	.4
Tourmaline (green)	3	.3
Zircon	2	.2
Casing scale	15	1.3
Total	1154	100%

Light Concentrate			
clay	1234	82.8
+ Quartz	161	10.8
* Feldspar	96	6.4
Total	1491	100%

Classification Grouping: Primary Minerals: 92.6 %	Absol. %
clay	81.8
quartz	10.8
garnet	.0
Hornblende	.0
Tourmaline	.0
Zircon	.0

Secondary Minerals: 7.4 %	
Feldspar	6.3
Pyrite	1.1
casing scale	.0
Total	100%

Revised Lithologic Description (from descriptive log and laboratory data).

Limestone, buff; grey; shaly; shale content, 3.5%;
some brown, hard Ls. fragments; pyrite <1%

* Feldspar, - very minute fragments, usually coated with shale, those washed clean show very narrow authigenic growths.

† Quartz in 1/16 - 1/32 size.

DEEP WELL STUDY

Well No. W— 6 15-1
Depth 590 to 610
No. samples used 2
Analyst T.H.T.
Date 8-20-34

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight . . . . . . 40 gm. 100.0% : 2. Wt. of F. P. 2.29
3. Wt. after solution, with filter paper . . . . 21.93 gm.
4. Less wt. F. P. (2) . . . . 2.29 gm.
5. Wt. Insol. Residue (3 minus 4) . . . . . . 19.64 gm. 49.2 %
6. Wt. lost by solution (1 minus 5) . . . . . . 20.36 gm. 50.8 %
7. To balance (5 plus 6) . . 40.00 gm. 100.0 %

B. Subsidation:

1. Original Wt. . . . . . . 19.64 gm. 100.0%
2. Cylinder (+1/32) 10.06 / 2.37 / 7.69 . . . 7.69 gm. 39.2%
3. Jar (1/32—1/64) 7.13 / 2.37 / 4.76 . . . 4.76 gm. 24.2%
4. Drain . . . . . . 7.19 gm. 36.6 %

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2-1 mm	.06	.7
1–½ mm	.08	1.0
½–¼ mm	.14	1.8
¼–⅛ mm	1.03	13.2
⅛–1/16	1.67	21.3
Pan	4.85	62.0
Total	7.83	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Analyst Rowser
Date Sept 19, 1934

Acet. Tetrabr. ~~Bromoform~~ } 2.93± Sp. gr. Size–Grade(s) 1/16-1/32 mm.

Wt. of sample . . . . 2.08 gm. 100.0%
Heavy Minerals . . . . .01 gm. .5 %
Light Minerals . . . . 2.07 gm. 99.5 %

Shape Analysis:

A ....%: a ....%: C ....%
r ....%: R ....%.

Minerals Identified; Heavy Concentrate	No. of Grains	Rel. %
Pyrite	1026	90.0
Hornblende	20	1.7
Zircon – unzoned	10	.9
Zircon – zoned	6	.5
Tourmaline – green	10	.9
Tourmaline – brown	11	1.0
	25	2.2
Quartz	17	1.5
Barite	3	.3
Staurolite	1	.1
Spinel	3	.3
Garnet	7	.6
Casing sc.		
Total	1139	100%

Light Concentrate	No. of Grains	Rel. %
Clay	695	53.1
Quartz	376	28.7
Feldspar	235	18.0
Glauconite	2	.2
Total	1308	100%

Classification Grouping: Absol. %

Primary Minerals: 81.4 %

Clay	52.8
Quartz	28.6
Hornblende	.0
Tourmaline	.0
Staurolite	.0
Spinel	.0
Garnet	.0

Secondary Minerals: 18.6 %

Feldspar	17.9
Glauconite	.2
Pyrite	.5
Barite	.0
Casing Scale	.0
Total	100%

Revised Lithologic Description (from descriptive log and laboratory data).

Limestone - 51%; lt gry; very shaley (49% shale); soft; 1-10% of hard Ls. fragments - more pure than rest of sample. Pyrite <1%. Quartz + Feldspar - 1/16 1/32 size.

*Feldspar coated with shale in majority of cases; those which are clean show very minute authigenic growths.

+ spinel — doubtful identification — is blue-green; flat, good cleavage; parts show very low biref; no usable figure obtained; surface pitted — many inclusions; only no 3 grains in slide. — index not definitely determined — is considerably higher than C.b.

DEEP WELL STUDY

Well No. W— 6151
Depth 610 to 630
No. samples used 2
Analyst T + T
Date 8-20-34

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15%)

1. Sample weight	40 gm.	100.0%	2. Wt. of F. P.	2.10
3. Wt. after solution, with filter paper	17.19 gm.			
4. Less wt. F. P. (2)	2.10 gm.			
5. Wt. Insol. Residue (3 minus 4)	15.09 gm.	37.6%		
6. Wt. lost by solution (1 minus 5)	24.91 gm.	62.4%		
7. To balance (5 plus 6)	40.00 gm.	100.0%		

B. Subsidation:

1. Original Wt.		15.09 gm.	100.0%	
2. Cylinder (+1/32)	9.70 2.20 7.50	7.50 gm.	49.7%	
3. Jar (1/32—1/64)	5.10 2.24	2.86 gm.	19.0%	
4. Drain	2.86	4.73 gm.	31.3%	

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
~~2~~ +1 mm	.18	2.4
1–½ mm	.35	4.7
½–¼ mm	.64	8.6
¼–⅛ mm	1.20	16.1
⅛–1/16	1.71	23.0
Pan	3.36	45.2
Total	7.44	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. ~~Bromoform~~ ±2.93 Sp. gr. Size–Grade(s) ¼–1/32 mm.

Analyst Rowser
Date Sept 20, 1934

Wt. of sample 2.21 gm. 100.0%

Heavy Minerals .03 gm. 1.4%

Light Minerals 2.18 gm. 98.6%

Shape Analysis:
A ...% : a ...% : C ...%
r ...% : R ...%.

Minerals Identified; Heavy Concentrate

	No. of Grains	Rel. %
*Pyrite	1100	86.9
Hornblende	12	.9
garnet	16	1.1
Tourmaline—Green	6	.5
Brown	1	.1
Blue	1	.1
staurolite	1	.1
Pistacite	1	.1
Barite	2	.2
Zircon—rounded	5	.4
clear	2	.2
clay	6	.5
quartz	5	.4
casing scale	10	.8
Total	1264	100%

Light Concentrate

clay		581	59.1
1 Quartz		484	28.8
2 Feldspar		115	11.7
3 Chert		4	.4
Total		984	100%

Classification Grouping:

Primary Minerals: ...%	Absol. %
clay	58.4
Quartz	28.5
Hornblende	.0
garnet	.0
Staurolite	.0
Pistacite	.0
Zircon	.0
Tourmaline	.0
Chert	.4

Secondary Minerals: ...%	
Feldspar	11.5
Pyrite	1.2
Barite	.0
casing scale	.0
Total	100%

Revised Lithologic Description (from descriptive log and laboratory data).

Limestone; 62%; very shy; (37% s/t shale) soft. light grey; some s/t; ±10%; composed of otz and Feldspar; Pyrite <1%

1. Quartz 95% in silt. size; in some of larger grains are inclusions of tourmaline.

2. Feldspar in minute fragments; all show some authigenic growth; 95% is orthoclase or untwinned plagio: about 3 or 4% show xl coating due to auth. growth. The clastic centers show some alteration.

3. Chert in clastic grains, somewhat rounded.

* Pyrite — in small xl aggregates and in rounded masses — some replacing organic forms probably some marcasite present, as well as pyrite, as a few grains appear lighter in color than others, while others may show both brass-yellow to silver. all grains show a tinge of yellow, however.

DEEP WELL STUDY

Well No. W— 0151
Depth 640 to 660
No. samples used 2
Analyst T & T
Date 8-20-34

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight	40 gm.	100.0%	2. Wt. of F. P.	2.26
3. Wt. after solution, with filter paper	26.74 gm.			
4. Less wt. F. P. (2)	2.26 gm.			
5. Wt. Insol. Residue (3 minus 4)	24.48 gm.	61.2 %		
6. Wt. lost by solution (1 minus 5)	15.52 gm.	38.8 %		
7. To balance (5 plus 6)	40.00 gm.	100.0 %		

B. Subsidation:

1. Original Wt.	24.48 gm.	100.0%		
2. Cylinder (+1/32)	6.02 2.29 3.73	3.73 gm.	15.2%	
3. Jar (1/32—1/64)	6.82 2.23	4.59 gm.	18.8 %	
4. Drain	4.59	16.19 gm.	66.0 %	

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm		
¼–⅛ mm		
⅛–1/16	3.54	100.0
Pan		
Total	3.54	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / ~~Bromoform~~ 2.93± Sp. gr. Size–Grade(s) ¼ - 32 mm.

Analyst Rowser
Date Sept 20, 1934

Wt. of sample 2.44 gm. 100.0%

Heavy Minerals .01 gm. .4 %

Light Minerals 2.43 gm. 99.6 %

Shape Analysis:

A ..... %: a ..... %: C ..... %

r ..... %: R ..... %.

Minerals Identified; Heavy Concentrate	No. of Grains	Rel. %
pyrite	84	85.4
Quartz	6 1	6.2
clay	58	5.9
Tourmaline Brown	5	.5
Tourmaline Green	4	.4
Zircon	8	.8
Hornblende	3	.3
Barite	5	.5
Total	98.4	100%

Classification Grouping:

Primary Minerals: 96.2 %

	Absol. %
clay	89.8
Quartz	6.4
Tourmaline	.0
Zircon	.0
Hornblende	.0

Light Concentrate		
clay	1057	90.1
Quartz	75	6.4
*Feldspar	41	3.5
Total	11.73	100%

Secondary Minerals: 3.8 %

Pyrite	.3
barite	.0
Feldspar	3.5
Total	100%

Revised Lithologic Description (from descriptive log and laboratory data).

shale, brown, very calcareous, 39% soluble; bet. exp. contains a very small percentage of silt; calcite, in 2%, in small rhombs; at 660' - in ⅛ - ½ - equivalent

* Feldspar – all show very minute authigrowths.

DEEP WELL STUDY

Well No. W— 0151
Depth 670 to 680
No. samples used 1
Analyst T & T
Date 8-20-34

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight	35 gm.	100.0% :	2. Wt. of F. P.	2.24
3. Wt. after solution, with filter paper	21.83 gm.			
4. Less wt. F. P. (2)	2.24 gm.			
5. Wt. Insol. Residue (3 minus 4)	19.59 gm.	56.0 %		
6. Wt. lost by solution (1 minus 5)	15.41 gm.	44.0 %		
7. To balance (5 plus 6)	35.00 gm.	100.0 %		

B. Subsidation:

1. Original Wt.	19.59 gm.	100.0%	
2. Cylinder (+1/32) 7.35 − 2.34 = 5.01	5.01 gm.	25.6 %	
3. Jar (1/32—1/64) 6.70 − 2.25 = 4.45	4.45 gm.	22.7 %	
4. Drain	10.13 gm.	51.7 %	

C. Screen Analysis

SIZE	GRAMS	%	
2 plus			S.G.I not Valid
2–1 mm	.21	4.4	
1–½ mm	.63	13.1	
½–¼ mm	.55	11.4	
¼–⅛ mm	.61	12.7	
⅛–1/16	1.26	26.2	
Pan	1.55	32.3	
Total	4.81	100.0	

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / ~~Bromoform~~ 2.93± Sp. gr. Size–Grade(s) 1/8-1/32 mm.

Analyst Rowser
Date Sept. 20, 1934

Wt. of sample 2.41 gm. 100.0%

Heavy Minerals 0.01 gm. .4 %

Light Minerals 2.40 gm. 99.6 %

Shape Analysis:
A ..... %: a ..... %: C ..... %
r ..... %: R ..... %.

Minerals Identified; Heavy Concentrate

	No. of Grains	Rel. %
* Pyrite	1157	93.9
Zircon [zoned	6	.5
Zircon [unzoned	7	.5
Tourmaline [Brown	7	.5
Tourmaline [Green	11	.9
Barite	5	.4
Hornblende	2	.2
Staurolite	1	.1
Garnet	2	.2
Quartz	31	2.4
Clay	16	1.3
dolomite	2	.2
Total	1237	100%

Classification Grouping: Primary Minerals: 70.6 %

	Absol. %
Clay	67.0
Quartz	23.6
Zircon	.0
Tourmaline	.0
Hornblende	.0
Staurolite	.0
Garnet	.0

Light Concentrate

Clay	921	67.3
Quartz	324	23.7
Feldspar	120	8.8
Glauconite	3	.2
Total	1368	100%

Secondary Minerals: 9.4 %

	Absol. %
Pyrite	.4
Glauconite	.2
Feldspar	8.8
Barite	.0
dolomite	.0
Total	100%

Revised Lithologic Description (from descriptive log and laboratory data).

Shale ± 20%; very calcareous — 44%, soluble — grey to brown; s/t; ±30%; composed of Qtz 60% and Feldspar, 37%; Pyrite 2%

* Pyrite — ±10% of pyrite occurs as rod-like grains - possibly replacements of organic substances - i.e. spines of some kind. Most of these grains have cubes + pyritohedrons growing around them - thusly,

some rods are curved, others straight, a few have pointed on one end.

** Feldspar all show minute bands of authigenic growth. Is 95% orthoclase or untwinned plagioclase. 5% microcline.

DEEP WELL STUDY

Well No. W— 0151

Depth 690 to 700

No. samples used 1

Analyst Powell

Date 7/19/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight	20.18 gm.	100.0%	2. Wt. of F. P.	
3. Wt. after solution, with filter paper	5.56 gm.			
4. Less wt. F. P. (2)	2.31 gm.			
5. Wt. Insol. Residue (3 minus 4)	3.25 gm.	16.0 %		
6. Wt. lost by solution (1 minus 5)	16.93 gm.	84.0 %		
7. To balance (5 plus 6)	20.18 gm.	100.0 %		

B. Subsidation:

1. Original Wt.	gm.	100.0%
2. Cylinder (+1/32)	gm.	%
3. Jar (1/32—1/64)	gm.	%
4. Drain	gm.	%

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm		
¼–⅛ mm		
⅛–1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform ..... Sp. gr. Size–Grade(s) ..... mm.

Analyst .....

Date .....

Wt. of sample . . . . gm. 100.0%

Heavy Minerals . . . . gm. %

Light Minerals . . . . gm. %

Shape Analysis:

A ..... %: a ..... %: C ..... %

r ..... %: R ..... %.

Minerals Identified; Heavy Concentrate	No. of Grains	Rel. %
Total		100%

Classification Grouping: Absol. %

Primary Minerals: ..... %

Secondary Minerals: ..... %

Light Concentrate

Total . . . . . 100% Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W— 0151

Depth 710 to 720

No. samples used 1

Analyst Pennel

Date 7/14/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight . . . . . 20.28 gm. 100.0%: 2. Wt. of F. P. .....
3. Wt. after solution, with filter paper . . . . . 3.32 gm.
4. Less wt. F. P. (2) . . . 2.44 gm.
5. Wt. Insol. Residue (3 minus 4) . . . . . .88 gm. 4.3 %
6. Wt. lost by solution (1 minus 5) . . . . . 19.40 gm. 95.7 %
7. To balance (5 plus 6) . . 20.28 gm. 100.0 %

B. Subsidation:

1. Original Wt. . . . . gm. 100.0%
2. Cylinder (+1/32) gm. %
3. Jar (1/32—1/64) gm. %
4. Drain . . . . . gm. %

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm		
¼–⅛ mm		
⅛–1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform ..... Sp. gr. Size–Grade(s) ..... mm.

Analyst .....

Date .....

Wt. of sample . . . . gm. 100.0%

Heavy Minerals . . . . gm. %

Light Minerals . . . . gm. %

Shape Analysis:

A ..... %: a ..... %: C ..... %

r ..... %: R ..... %.

Minerals Identified:
Heavy Concentrate

No. of Grains | Rel. %

Classification Grouping:
Primary Minerals: ..... %

Absol. %

Total 100%

Light Concentrate

Secondary Minerals: ..... %

Total 100%

Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W— 0151

Depth 720 to 740

No. samples used 2

Analyst Pannel

Date 7/19/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight . . . . . 20.81 gm. 100.0% : 2. Wt. of F. P.
3. Wt. after solution, with filter paper . . . . . 3.29 gm.
4. Less wt. F. P. (2) . . . 2.36 gm.
5. Wt. Insol. Residue (3 minus 4) . . . . . .93 gm. 4.5 %
6. Wt. lost by solution (1 minus 5) . . . . . 19.94 gm. 95.5 %
7. To balance (5 plus 6) . . 20.87 gm. 100.0 %

B. Subsidation:

1. Original Wt. . . . . gm. 100.0%
2. Cylinder (+1/32) gm. %
3. Jar (1/32—1/64) gm. %
4. Drain . . . . . gm. %

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm		
¼–⅛ mm		
⅛–1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform ..... Sp. gr. Size–Grade(s) ..... mm.

Analyst .....

Date .....

Wt. of sample . . . . gm. 100.0%

Heavy Minerals . . . . gm. %

Light Minerals . . . . gm. %

Shape Analysis:

A. %: a. %: C. %

r %: R %.

Minerals Identified; Heavy Concentrate — No. of Grains — Rel. %

Classification Grouping: — Absol. %

Primary Minerals: %

Total 100%

Light Concentrate

Secondary Minerals: %

Total . . . . . 100% Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W— 0151

Depth 750 to 760

No. samples used .....

Analyst Russel

Date 7/19/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight	20.19 gm.	100.0%	2. Wt. of F. P.	
3. Wt. after solution, with filter paper	3.49 gm.			
4. Less wt. F. P. (2)	2.35 gm.			
5. Wt. Insol. Residue (3 minus 4)	1.14 gm.	5.6 %		
6. Wt. lost by solution (1 minus 5)	19.05 gm.	94.4 %		
7. To balance (5 plus 6)	20.19 gm.	100.0 %		

B. Subsidation:

1. Original Wt.	gm.	100.0%
2. Cylinder (+1/32)	gm.	%
3. Jar (1/32—1/64)	gm.	%
4. Drain	gm.	%

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm		
¼–⅛ mm		
⅛–1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Analyst .....

Date .....

Acet. Tetrabr. / Bromoform ..... Sp. gr. Size–Grade(s) ..... mm.

Wt. of sample ..... gm. 100.0%

Heavy Minerals ..... gm. ..... %

Light Minerals ..... gm. ..... %

Shape Analysis:

A ..... %: a ..... %: C ..... %

r ..... %: R ..... %.

Minerals Identified; Heavy Concentrate	No. of Grains	Rel. %
Total		100%
Light Concentrate		
Total		100%

Classification Grouping: Absol. %

Primary Minerals: ..... %

Secondary Minerals: ..... %

Total 100%

Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W— 2151

Depth 770 to 780

No. samples used

Analyst Pennel

Date 11/19/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight	20.14 gm.	100.0%	2. Wt. of F. P.	
3. Wt. after solution, with filter paper	3.60 gm.			
4. Less wt. F. P. (2)	2.33 gm.			
5. Wt. Insol. Residue (3 minus 4)	1.27 gm.	6.3 %		
6. Wt. lost by solution (1 minus 5)	18.87 gm.	93.7 %		
7. To balance (5 plus 6)	20.14 gm.	100.0 %		

B. Subsidation:

1. Original Wt.	gm.	100.0%
2. Cylinder (+1/32)	gm.	%
3. Jar (1/32—1/64)	gm.	%
4. Drain	gm.	%

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm		
¼–⅛ mm		
⅛–1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform ..... Sp. gr. Size–Grade(s) ..... mm.

Analyst

Date

Wt. of sample ..... gm. 100.0%

Heavy Minerals ..... gm. ..... %

Light Minerals ..... gm. ..... %

Shape Analysis:

A ..... %: a ..... %: C ..... %

r ..... %: R ..... %.

Minerals Identified; Heavy Concentrate	No. of Grains	Rel. %
Total		100%

Classification Grouping: Absol. %

Primary Minerals: ..... %

Secondary Minerals: ..... %

Light Concentrate

Total 100% Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W— 0151

Depth 790 to 800

No. samples used

Analyst Pennel

Date 7/19/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight . . . . . 20.44 gm. 100.0%: 2. Wt. of F. P.
3. Wt. after solution, with filter paper . . . . . 6.40 gm.
4. Less wt. F. P. (2) . . . 2.42 gm.
5. Wt. Insol. Residue (3 minus 4) . . . . . 3.98 gm. 19.5 %
6. Wt. lost by solution (1 minus 5) . . . . . 16.46 gm. 80.5 %
7. To balance (5 plus 6) . . 20.44 gm. 100.0 %

B. Subsidation:

1. Original Wt. . . . . gm. 100.0%
2. Cylinder (+1/32) gm. %
3. Jar (1/32—1/64) gm. %
4. Drain . . . . . gm. %

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm		
¼–⅛ mm		
⅛–1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform } Sp. gr. Size–Grade(s) mm.

Analyst

Date

Wt. of sample . . . . gm. 100.0%

Heavy Minerals . . . . gm. %

Light Minerals . . . . gm. %

Shape Analysis:

A. %: a. %: C. %

r %: R %.

Minerals Identified: Heavy Concentrate | No. of Grains | Rel. % | Classification Grouping: Primary Minerals: % | Absol. %

Total 100%

Light Concentrate

Secondary Minerals: %

Total . . . . . 100% Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W— 0151

Depth 820 to 840

No. samples used

Analyst Powell

Date 7/9/65

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight	20.11 gm.	100.0%	2. Wt. of F. P.	
3. Wt. after solution, with filter paper	10.53 gm.			
4. Less wt. F. P. (2)	4.16 gm.			
5. Wt. Insol. Residue (3 minus 4)	6.37 gm.	31.6 %		
6. Wt. lost by solution (1 minus 5)	13.74 gm.	68.4 %		
7. To balance (5 plus 6)	20.1 gm.	100.0 %		

B. Subsidation:

1. Original Wt.	gm.	100.0%
2. Cylinder (+1/32)	gm.	%
3. Jar (1/32—1/64)	gm.	%
4. Drain	gm.	%

C. Screen Analysis 6.12

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm	5.16	85.3
¼–⅛ mm	.37	6.1
⅛–1/16	.22	3.6
Pan	.30	5.0
Total	6.05	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform ..... Sp. gr. Size–Grade(s) ..... mm.

Analyst

Date

Wt. of sample ..... gm. 100.0%

Heavy Minerals ..... gm. %

Light Minerals ..... gm. %

Shape Analysis:

A ..... %: a ..... %: C ..... %

r ..... %: R ..... %.

Minerals Identified; Heavy Concentrate	No. of Grains	Rel. %
Total		100%

Classification Grouping: Absol. %

Primary Minerals: ..... %

Secondary Minerals: ..... %

Light Concentrate

Total 100%

Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W— 0151

Depth 810 to 820

No. samples used 1

Analyst Re el

Date 7-35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight	20.26 gm.	100.0%	2. Wt. of F. P.
3. Wt. after solution, with filter paper	10.37 gm.		
4. Less wt. F. P. (2)	4.27 gm.		
5. Wt. Insol. Residue (3 minus 4)	6.10 gm.	30.0 %	
6. Wt. lost by solution (1 minus 5)	14.16 gm.	70.0 %	
7. To balance (5 plus 6)	20.26 gm.	100.0 %	

B. Subsidation:

1. Original Wt.	gm.	100.0%
2. Cylinder (+1/32)	gm.	%
3. Jar (1/32—1/64)	gm.	%
4. Drain	gm.	%

C. Screen Analysis 5.92

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm	4.51	77.3
¼–⅛ mm	.63	10.8
⅛–1/16	.65	11.1
Pan	.05	.8
Total	5.84	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform ..... Sp. gr. Size–Grade(s) ..... mm.

Analyst .....

Date .....

Wt. of sample . . . . gm. 100.0%

Heavy Minerals . . . . gm. %

Light Minerals . . . . gm. %

Shape Analysis:

A ..... %: a ..... %: C ..... %

r ..... %: R ..... %.

Minerals Identified; Heavy Concentrate	No. of Grains	Rel. %
Total		100%
Light Concentrate		
Total		100%

Classification Grouping: Absol. %

Primary Minerals: ..... %

Secondary Minerals: ..... %

Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W— 0151

Depth 820 to 830

No. samples used .....

Analyst Rauch

Date 7/9/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight . . . . . 20.48 gm. 100.0% : 2. Wt. of F. P. .....
3. Wt. after solution, with filter paper . . . . . 5.26 gm.
4. Less wt. F. P. (2) . . . .42 gm.
5. Wt. Insol. Residue (3 minus 4) . . . . . .84 gm. 3.9 %
6. Wt. lost by solution (1 minus 5) . . . . . 19.64 gm. 86.1 %
7. To balance (5 plus 6) . . 20.48 gm. 100.0 %

B. Subsidation:

1. Original Wt. . . . . gm. 100.0%
2. Cylinder (+1/32) gm. %
3. Jar (1/32—1/64) gm. %
4. Drain . . . . . gm. %

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm		
¼–⅛ mm		
⅛–1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform ..... Sp. gr. Size–Grade(s) ..... mm.

Analyst .....

Date .....

Wt. of sample . . . . gm. 100.0% Shape Analysis:

Heavy Minerals . . . . gm. % A ..... % : a ..... % : C ..... %

Light Minerals . . . . gm. % r ..... % : R ..... %.

Minerals Identified; Heavy Concentrate	No. of Grains	Rel. %
Total		100%
Light Concentrate		
Total		100%

Classification Grouping: Absol. %

Primary Minerals: ..... %

Secondary Minerals: ..... %

Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W— 0151

Depth 830 to 840

No. samples used

Analyst Pe el

Date 11/9/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 5 %)

1. Sample weight . . . . . 20.09 gm. 100.0% : 2. Wt. of F. P.
3. Wt. after solution, with filter paper . . . . . 3.84 gm.
4. Less wt. F. P. (2) . . . 2.42 gm.
5. Wt. Insol. Residue (3 minus 4) . . . . . 1.42 gm. 7.1 %
6. Wt. lost by solution (1 minus 5) . . . . . 18.67 gm. 92.9 %
7. To balance (5 plus 6) . . 20.09 gm. 100.0 %

B. Subsidation:

1. Original Wt. . . . . gm. 100.0%
2. Cylinder (+1/32) gm. %
3. Jar (1/32—1/64) gm. %
4. Drain . . . . . gm. %

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm		
¼–⅛ mm		
⅛–1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform ..... Sp. gr. Size–Grade(s) ..... mm.

Analyst

Date

Wt. of sample . . . . gm. 100.0%

Heavy Minerals . . . . gm. %

Light Minerals . . . . gm. %

Shape Analysis:

A ..... %: a ..... %: C ..... %

r ..... %: R ..... %.

Minerals Identified; Heavy Concentrate — No. of Grains — Rel. % — Absol. %

Classification Grouping:

Primary Minerals: ..... %

Total 100%

Light Concentrate

Secondary Minerals: ..... %

Total . . . . . 100% Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W— 2151

Depth 850 to 860

No. samples used .....

Analyst Penn E

Date 1-35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight	20.30 gm.	100.0%	2. Wt. of F. P.	
3. Wt. after solution, with filter paper	3.10 gm.			
4. Less wt. F. P. (2)	2.31 gm.			
5. Wt. Insol. Residue (3 minus 4)	.79 gm.	3.9 %		
6. Wt. lost by solution (1 minus 5)	19.51 gm.	96.1 %		
7. To balance (5 plus 6)	20.30 gm.	100.0 %		

B. Subsidation:

1. Original Wt.	gm.	100.0%
2. Cylinder (+1/32)	gm.	%
3. Jar (1/32—1/64)	gm.	%
4. Drain	gm.	%

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm		
¼–⅛ mm		
⅛–1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform ..... Sp. gr. Size–Grade(s) ..... mm.

Analyst .....

Date .....

Wt. of sample ..... gm. 100.0%

Heavy Minerals ..... gm. ..... %

Light Minerals ..... gm. ..... %

Shape Analysis:

A ..... %: a ..... %: C ..... %

r ..... %: R ..... %.

Minerals Identified; Heavy Concentrate	No. of Grains	Rel. %
Total		100%

Classification Grouping: Absol. %

Primary Minerals: ..... %

Secondary Minerals: ..... %

Light Concentrate		
Total		100%

Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W— 0151

Depth 812 to 820

No. samples used .....

Analyst I

Date 35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 5 %)

1. Sample weight . . . . . 20.20 gm. 100.0% : 2. Wt. of F. P. .....
3. Wt. after solution, with filter paper . . . . . 3.27 gm.
4. Less wt. F. P. (2) . . . 2.43 gm.
5. Wt. Insol. Residue (3 minus 4) . . . . . .84 gm. 4.2 %
6. Wt. lost by solution (1 minus 5) . . . . . 19.36 gm. 95.8 %
7. To balance (5 plus 6) . . . . gm. 100.0 %

B. Subsidation:

1. Original Wt. . . . . gm. 100.0%
2. Cylinder (+1/32) . . . . . gm. %
3. Jar (1/32—1/64) . . . . . gm. %
4. Drain . . . . . gm. %

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm		
¼–⅛ mm		
⅛–1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform ..... Sp. gr. Size–Grade(s) ..... mm.

Analyst .....

Date .....

Wt. of sample . . . . gm. 100.0%

Heavy Minerals . . . . gm. %

Light Minerals . . . . gm. %

Shape Analysis:

A ..... %: a ..... %: C ..... %

r ..... %: R ..... %.

Minerals Identified; Heavy Concentrate	No. of Grains	Rel. %
Total		100%
Light Concentrate		
Total		100%

Classification Grouping: Absol. %

Primary Minerals: ..... %

Secondary Minerals: ..... %

Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W— 2151

Depth 890 to 900

No. samples used .....

Analyst .....

Date 7-9-35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight	20.21 gm.	100.0%	2. Wt. of F. P. .....
3. Wt. after solution, with filter paper	3.21 gm.		
4. Less wt. F. P. (2)	.36 gm.		
5. Wt. Insol. Residue (3 minus 4)	.85 gm.	4.2 %	
6. Wt. lost by solution (1 minus 5)	19.36 gm.	95.8 %	
7. To balance (5 plus 6)	20.2 gm.	100.0 %	

B. Subsidation:

1. Original Wt.	..... gm.	100.0%
2. Cylinder (+1/32)	..... gm.	..... %
3. Jar (1/32—1/64)	..... gm.	..... %
4. Drain	..... gm.	..... %

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm		
¼–⅛ mm		
⅛–1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform ..... Sp. gr. Size–Grade(s) ..... mm.

Analyst .....

Date .....

Wt. of sample ..... gm. 100.0%

Heavy Minerals ..... gm. ..... %

Light Minerals ..... gm. ..... %

Shape Analysis:

A ..... %: a ..... %: C ..... %

r ..... %: R ..... %.

Minerals Identified; Heavy Concentrate	No. of Grains	Rel. %
Total		100%

Classification Grouping: Absol. %

Primary Minerals: ..... %

Secondary Minerals: ..... %

Light Concentrate		
Total		100%

Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W— 2151

Depth 910 to 920

No. samples used 1

Analyst [illegible]

Date 7/4/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 5 %)

1. Sample weight . . . . . 20.11 gm. 100.0% : 2. Wt. of F. P. .....
3. Wt. after solution, with filter paper . . . . . 4.49 gm.
4. Less wt. F. P. (2) . . . 2.45 gm.
5. Wt. Insol. Residue (3 minus 4) . . . . . 2.04 gm. 10.1 %
6. Wt. lost by solution (1 minus 5) . . . . . 18.07 gm. 89.9 %
7. To balance (5 plus 6) . . 20 gm. 99.0 %

B. Subsidation:

1. Original Wt. . . . . gm. 100.0%
2. Cylinder (+1/32) gm. %
3. Jar (1/32—1/64) gm. %
4. Drain . . . . . gm. %

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm		
¼–⅛ mm		
⅛–1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform ..... Sp. gr. Size–Grade(s) ..... mm.

Analyst .....

Date .....

Wt. of sample . . . . gm. 100.0%

Heavy Minerals . . . . gm. %

Light Minerals . . . . gm. %

Shape Analysis:

A ..... %: a ..... %: C ..... %

r ..... %: R ..... %.

Minerals Identified: Heavy Concentrate — No. of Grains — Rel. %

Classification Grouping: Absol. %

Primary Minerals: ..... %

Total 100%

Light Concentrate

Secondary Minerals: ..... %

Total . . . . . 100% Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W— 2151

Depth 93 to 97.5

No. samples used

Analyst

Date 7/19/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 5 %)

1. Sample weight	20.17 gm.	100.0%	2. Wt. of F. P.	
3. Wt. after solution, with filter paper	3.79 gm.			
4. Less wt. F. P. (2)	2.35 gm.			
5. Wt. Insol. Residue (3 minus 4)	1.44 gm.	7.1 %		
6. Wt. lost by solution (1 minus 5)	18.73 gm.	92.9 %		
7. To balance (5 plus 6)	20.17 gm.	100.0 %		

B. Subsidation:

1. Original Wt.	gm.	100.0%
2. Cylinder (+1/32)	gm.	%
3. Jar (1/32—1/64)	gm.	%
4. Drain	gm.	%

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm		
¼–⅛ mm		
⅛–1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform ..... Sp. gr. Size–Grade(s) ..... mm.

Analyst

Date

Wt. of sample ..... gm. 100.0%

Heavy Minerals ..... gm. ..... %

Light Minerals ..... gm. ..... %

Shape Analysis:

A ..... %: a ..... %: C ..... %

r ..... %: R ..... %.

Minerals Identified; Heavy Concentrate	No. of Grains	Rel. %
Total		100%

Classification Grouping: Absol. %

Primary Minerals: ..... %

Secondary Minerals: ..... %

Light Concentrate		
Total		100%

Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W— 0151

Depth 940 to 950

No. samples used .....

Analyst .....

Date .....

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight	20.23 gm.	100.0%	2. Wt. of F. P.	
3. Wt. after solution, with filter paper	3.88 gm.			
4. Less wt. F. P. (2)	2.38 gm.			
5. Wt. Insol. Residue (3 minus 4)	1.50 gm.	7.4 %		
6. Wt. lost by solution (1 minus 5)	18.73 gm.	92.6 %		
7. To balance (5 plus 6)	0.23 gm.	100.0 %		

B. Subsidation:

1. Original Wt.	gm.	100.0%
2. Cylinder (+1/32)	gm.	%
3. Jar (1/32—1/64)	gm.	%
4. Drain	gm.	%

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm		
¼–⅛ mm		
⅛–1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform ..... Sp. gr. Size–Grade(s) ..... mm.

Analyst .....

Date .....

Wt. of sample ..... gm. 100.0%

Heavy Minerals ..... gm. ..... %

Light Minerals ..... gm. ..... %

Shape Analysis:

A ..... %: a ..... %: C ..... %

r ..... %: R ..... %.

Minerals Identified; Heavy Concentrate	No. of Grains	Rel. %
Total		100%

Classification Grouping: Absol. %

Primary Minerals: ..... %

Secondary Minerals: ..... %

Light Concentrate		
Total		100%

Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W-- 015

Depth 960 to 970

No. samples used

Analyst Pannel

Date 7/9/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight	20.36 gm.	100.0%	2. Wt. of F. P.
3. Wt. after solution, with filter paper	5.76 gm.		
4. Less wt. F. P. (2)	4.17 gm.		
5. Wt. Insol. Residue (3 minus 4)	1.59 gm.	7.8 %	
6. Wt. lost by solution (1 minus 5)	18.77 gm.	92.2 %	
7. To balance (5 plus 6)	20.36 gm.	100.0 %	

B. Subsidation:

1. Original Wt.	gm.	100.0%
2. Cylinder (+1/32)	gm.	%
3. Jar (1/32—1/64)	gm.	%
4. Drain	gm.	%

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm		
¼–⅛ mm		
⅛–1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform ..... Sp. gr. Size–Grade(s) ..... mm.

Analyst

Date

Wt. of sample ..... gm. 100.0%

Heavy Minerals ..... gm. ..... %

Light Minerals ..... gm. ..... %

Shape Analysis:

A ..... %: a ..... %: C ..... %

r ..... %: R ..... %.

Minerals Identified; Heavy Concentrate — No. of Grains — Rel. % — Absol. %

Classification Grouping:

Primary Minerals: ..... %

Total 100%

Light Concentrate

Secondary Minerals: ..... %

Total ..... 100% Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W— 0151
Depth 940 to 990
No. samples used 1
Analyst Rowe
Date 7/19/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight	20.19 gm.	100.0%	2. Wt. of F. P.	
3. Wt. after solution, with filter paper	5.00 gm.			
4. Less wt. F. P. (2)	4.31 gm.			
5. Wt. Insol. Residue (3 minus 4)	.69 gm.	3.4 %		
6. Wt. lost by solution (1 minus 5)	19.50 gm.	96.6 %		
7. To balance (5 plus 6)	20.19 gm.	100.0 %		

B. Subsidation:

1. Original Wt.	gm.	100.0%
2. Cylinder (+1/32)	gm.	%
3. Jar (1/32—1/64)	gm.	%
4. Drain	gm.	%

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm		
¼–⅛ mm		
⅛–1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Analyst
Date

Acet. Tetrabr. / Bromoform } Sp. gr. Size–Grade(s) mm.

Wt. of sample gm. 100.0%

Heavy Minerals gm. %

Light Minerals gm. %

Shape Analysis:

A %: a %: C %

r %: R %.

Minerals Identified; Heavy Concentrate — No. of Grains — Rel. %

Classification Grouping: — Absol. %

Primary Minerals: %

Total 100%

Light Concentrate

Secondary Minerals: %

Total 100% Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W— 2151

Depth 22 to 2

No. samples used

Analyst [illegible]

Date 7/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight	20.11 gm.	100.0%	2. Wt. of F. P.	
3. Wt. after solution, with filter paper	6.17 gm.			
4. Less wt. F. P. (2)	4.05 gm.			
5. Wt. Insol. Residue (3 minus 4)	2.12 gm.	10.5 %		
6. Wt. lost by solution (1 minus 5)	17.99 gm.	89.5 %		
7. To balance (5 plus 6)	20.11 gm.	100.0 %		

B. Subsidation:

1. Original Wt.	gm.	100.0%
2. Cylinder (+1/32)	gm.	%
3. Jar (1/32—1/64)	gm.	%
4. Drain	gm.	%

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm		
¼–⅛ mm		
⅛–1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform ..... Sp. gr. Size–Grade(s) ..... mm.

Analyst

Date

Wt. of sample ..... gm. 100.0%

Heavy Minerals ..... gm. ..... %

Light Minerals ..... gm. ..... %

Shape Analysis:

A ..... %: a ..... %: C ..... %

r ..... %: R ..... %.

Minerals Identified; Heavy Concentrate	No. of Grains	Rel. %
Total		100%
Light Concentrate		
Total		100%

Classification Grouping: Absol. %

Primary Minerals: ..... %

Secondary Minerals: ..... %

Total 100%

Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W— 0151

Depth 1010 to 1020

No. samples used 1

Analyst Pel e/

Date 7/19/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl.....%)

1. Sample weight . . . . . 20.27 gm. 100.0% : 2. Wt. of F. P.....
3. Wt. after solution, with filter paper . . . . . 14.69 gm.
4. Less wt. F. P. (2) . . . 4.2 gm.
5. Wt. Insol. Residue (3 minus 4) . . . . . 10.47 gm. 51.7 %
6. Wt. lost by solution (1 minus 5) . . . . . 9.79 gm. 48.3 %
7. To balance (5 plus 6) . . 20.27 gm. 100.0 %

B. Subsidation:

1. Original Wt. . . . .gm. 100.0%
2. Cylinder (+1/32) .....gm.....%
3. Jar (1/32—1/64) .....gm.....%
4. Drain . . . .gm.....%

C. Screen Analysis 10.32

SIZE	GRAMS	%
2 plus	/	
2–1 mm	/	
1–½ mm	/	
½–¼ mm	7.33	71.6
¼–⅛ mm	.81	7.8
⅛–1/16	.73	7.1
Pan	1.38	13.5
Total	10.25	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform ..... Sp. gr. Size–Grade(s) ..... mm.

Analyst .....

Date .....

Wt. of sample . . . .gm. 100.0%

Heavy Minerals . . . .gm.....%

Light Minerals . . . .gm.....%

Shape Analysis:

A.....%: a.....%: C.....%

r.....%: R.....%.

Minerals Identified; Heavy Concentrate	No. of Grains	Rel. %
Total		100%

Classification Grouping: Absol. %

Primary Minerals: .....%

Secondary Minerals: .....%

Light Concentrate

Total . . . . . 100% Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W-- 0151

Depth 1020 to 1030

No. samples used 1

Analyst Pennel

Date 7/19/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl.....%)

1. Sample weight . . . . . 20.23 gm. 100.0% : 2. Wt. of F. P.....
3. Wt. after solution, with filter paper . . . . . 15.30 gm.
4. Less wt. F. P. (2) . . . 4.24 gm.
5. Wt. Insol. Residue (3 minus 4) . . . . . 11.06 gm. 54.6%
6. Wt. lost by solution (1 minus 5) . . . . . 9.17 gm. 45.4%
7. To balance (5 plus 6) . . 20.23 gm. 100.0%

B. Subsidation:

1. Original Wt. . . . .gm. 100.0%
2. Cylinder (+1/32) .....gm.....%
3. Jar (1/32—1/64) .....gm.....%
4. Drain . . . .gm.....%

C. Screen Analysis 10.89

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm	8.53	78.4
¼–⅛ mm	.64	5.9
⅛–1/16	.56	5.1
Pan	1.16	10.6
Total	10.89	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform } .....Sp. gr. Size–Grade(s).....mm.

Analyst .....

Date .....

Wt. of sample . . . .gm. 100.0%

Heavy Minerals . . . .gm.....%

Light Minerals . . . .gm.....%

Shape Analysis:

A.....%: a.....%: C.....%

r.....%: R.....%.

Minerals Identified; Heavy Concentrate — No. of Grains — Rel. %

Classification Grouping: — Absol. %

Primary Minerals: .....%

Total 100%

Light Concentrate

Secondary Minerals: .....%

Total . . . . . 100% Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W— 151

Depth 1030 to 1040

No. samples used .....

Analyst Pennel

Date 7/19/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight . . . . . 20.16 gm. 100.0% : 2. Wt. of F. P. .....
3. Wt. after solution, with filter paper . . . . . 11.00 gm.
4. Less wt. F. P. (2) . . . 4.28 gm.
5. Wt. Insol. Residue (3 minus 4) . . . . . 6.72 gm. 33.4 %
6. Wt. lost by solution (1 minus 5) . . . . . 13.44 gm. 66.6 %
7. To balance (5 plus 6) . . 20.16 gm. 100.0 %

B. Subsidation:

1. Original Wt. . . . . gm. 100.0%
2. Cylinder (+1/32) . . . . . gm. %
3. Jar (1/32—1/64) . . . . . gm. %
4. Drain . . . . . gm. %

C. Screen Analysis 6.47

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm	3.43	54.0
¼–⅛ mm	1.12	17.6
⅛–1/16	.12	17.6
Pan	.69	10.8
Total	6.36	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform ..... Sp. gr. Size–Grade(s) ..... mm.

Analyst .....

Date .....

Wt. of sample . . . . gm. 100.0%

Heavy Minerals . . . . gm. %

Light Minerals . . . . gm. %

Shape Analysis:

A ..... %: a ..... %: C ..... %

r ..... %: R ..... %.

Minerals Identified; Heavy Concentrate	No. of Grains	Rel. %
Total		100%
Light Concentrate		
Total		100%

Classification Grouping: Absol. %

Primary Minerals: ..... %

Secondary Minerals: ..... %

Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W— 0151
Depth 1060 to 1070
No. samples used
Analyst Pannel
Date 7/19/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight	20.12 gm.	100.0%	2. Wt. of F. P.	
3. Wt. after solution, with filter paper	19.07 gm.			
4. Less wt. F. P. (2)	4.11 gm.			
5. Wt. Insol. Residue (3 minus 4)	14.96 gm.	74.4 %		
6. Wt. lost by solution (1 minus 5)	5.16 gm.	25.6 %		
7. To balance (5 plus 6)	20.12 gm.	100.0 %		

B. Subsidation:

1. Original Wt.	gm.	100.0%
2. Cylinder (+1/32)	gm.	%
3. Jar (1/32—1/64)	gm.	%
4. Drain	gm.	%

C. Screen Analysis 14.74

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm	14.10	96.2
¼–⅛ mm	.20	1.4
⅛–1/16	.11	.8
Pan	.23	1.6
Total	14.64	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform ..... Sp. gr. Size–Grade(s) ..... mm.

Analyst
Date

Wt. of sample ..... gm. 100.0%

Heavy Minerals ..... gm. ..... %

Light Minerals ..... gm. ..... %

Shape Analysis:

A ..... %: a ..... %: C ..... %

r ..... %: R ..... %.

Minerals Identified; Heavy Concentrate	No. of Grains	Rel. %
Total		100%
Light Concentrate		
Total		100%

Classification Grouping: Absol. %

Primary Minerals: ..... %

Secondary Minerals: ..... %

Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W-- 0151

Depth 1080 to 1090

No. samples used

Analyst

Date 7/19/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight	20.01 gm.	100.0%	2. Wt. of F. P.	
3. Wt. after solution, with filter paper	12.79 gm.			
4. Less wt. F. P. (2)	4.2 gm.			
5. Wt. Insol. Residue (3 minus 4)	8.57 gm.	42.8 %		
6. Wt. lost by solution (1 minus 5)	11.44 gm.	57.2 %		
7. To balance (5 plus 6)	20.01 gm.	100.0 %		

B. Subsidation:

1. Original Wt.	gm.	100.0%
2. Cylinder (+1/32)	gm.	%
3. Jar (1/32—1/64)	gm.	%
4. Drain	gm.	%

C. Screen Analysis 8.30

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm	7.88	95.3
¼–⅛ mm	.09	1.1
⅛–1/16	.12	1.4
Pan	.18	2.2
Total	8.27	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform ..... Sp. gr. Size–Grade(s) ..... mm.

Analyst

Date

Wt. of sample ..... gm. 100.0% Shape Analysis:

Heavy Minerals ..... gm. ..... % A ..... %: a ..... %: C ..... %

Light Minerals ..... gm. ..... % r ..... %: R ..... %.

Minerals Identified; Heavy Concentrate	No. of Grains	Rel. %
Total		100%
Light Concentrate		
Total		100%

Classification Grouping: Absol. %

Primary Minerals: ..... %

Secondary Minerals: ..... %

Total 100%

Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W— 0151

Depth 1110 to 1120

No. samples used 1

Analyst P.—

Date 7/19/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight	20.22	gm.	100.0%	2. Wt. of F. P.
3. Wt. after solution, with filter paper	13.59	gm.		
4. Less wt. F. P. (2)	4.19	gm.		
5. Wt. Insol. Residue (3 minus 4)	9.40	gm.	46.4 %	
6. Wt. lost by solution (1 minus 5)	10.82	gm.	53.6 %	
7. To balance (5 plus 6)	20.22	gm.	100.0 %	

B. Subsidation:

1. Original Wt.	7.40	gm.	100.0%	
2. Cylinder (+1/32) 5.70 2.34	3.3	gm.	35.2 %	
3. Jar (1/32—1/64) .62 .30	.32	gm.	3.4 %	
4. Drain	5.77	gm.	61.4 %	

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm		
¼–⅛ mm		
⅛–1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform ..... Sp. gr. Size–Grade(s) ..... mm.

Analyst .....

Date .....

Wt. of sample . . . . gm. 100.0%

Heavy Minerals . . . . gm. %

Light Minerals . . . . gm. %

Shape Analysis:

A ..... %: a ..... %: C ..... %

r ..... %: R ..... %.

Minerals Identified; Heavy Concentrate	No. of Grains	Rel. %
Total		100%

Classification Grouping: Absol. %

Primary Minerals: ..... %

Secondary Minerals: ..... %

Light Concentrate

Total 100%

Total . . . . . 100% Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W— 0151

Depth 1130 to 1140

No. samples used

Analyst P—

Date 7/19/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight	20.25 gm.	100.0%	2. Wt. of F. P.	
3. Wt. after solution, with filter paper	18.02 gm.			
4. Less wt. F. P. (2)	4.2 gm.			
5. Wt. Insol. Residue (3 minus 4)	13.81 gm.	68.2 %		
6. Wt. lost by solution (1 minus 5)	6.44 gm.	31.8 %		
7. To balance (5 plus 6)	20.25 gm.	100.0 %		

B. Subsidation:

1. Original Wt.	gm.	100.0%
2. Cylinder (+1/32)	gm.	%
3. Jar (1/32—1/64)	gm.	%
4. Drain	gm.	%

C. Screen Analysis 13.60

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm	12.57	92.4
¼–⅛ mm	.37	2.7
⅛–1/16	.49	3.6
Pan	.18	1.3
Total	13.6	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform ..... Sp. gr. Size–Grade(s) ..... mm.

Analyst

Date

Wt. of sample ..... gm. 100.0%

Heavy Minerals ..... gm. ..... %

Light Minerals ..... gm. ..... %

Shape Analysis:

A ..... %: a ..... %: C ..... %

r ..... %: R ..... %.

Minerals Identified; Heavy Concentrate	No. of Grains	Rel. %
Total		100%
Light Concentrate		
Total		100%

Classification Grouping: Absol. %

Primary Minerals: ..... %

Secondary Minerals: ..... %

Total 100%

Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W— 0151

Depth 115 to 160

No. samples used

Analyst P.

Date 7/19/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight	20.16 gm.	100.0%	2. Wt. of F. P.
3. Wt. after solution, with filter paper	4.92 gm.		
4. Less wt. F. P. (2)	2.40 gm.		
5. Wt. Insol. Residue (3 minus 4)	2.52 gm.	12.5 %	
6. Wt. lost by solution (1 minus 5)	17.64 gm.	87.5 %	
7. To balance (5 plus 6)	20.16 gm.	100.0 %	

B. Subsidation:

1. Original Wt.	gm.	100.0%
2. Cylinder (+1/32)	gm.	%
3. Jar (1/32—1/64)	gm.	%
4. Drain	gm.	%

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm		
¼–⅛ mm		
⅛–1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform ..... Sp. gr. Size–Grade(s) ..... mm.

Analyst

Date

Wt. of sample ..... gm. 100.0%

Heavy Minerals ..... gm. ..... %

Light Minerals ..... gm. ..... %

Shape Analysis:

A ..... %: a ..... %: C ..... %

r ..... %: R ..... %.

Minerals Identified: Heavy Concentrate	No. of Grains	Rel. %
Total		100%
Light Concentrate		
Total		100%

Classification Grouping: Absol. %

Primary Minerals: ..... %

Secondary Minerals: ..... %

Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W— 0151

Depth 70 to 1180

No. samples used

Analyst K

Date 7/19/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight	20.16 gm.	100.0%	2. Wt. of F. P.
3. Wt. after solution, with filter paper	3.16 gm.		
4. Less wt. F. P. (2)	2.31 gm.		
5. Wt. Insol. Residue (3 minus 4)	.85 gm.	4.2 %	
6. Wt. lost by solution (1 minus 5)	19.31 gm.	95.8 %	
7. To balance (5 plus 6)	20.16 gm.	100.0 %	

B. Subsidation:

1. Original Wt.	gm.	100.0%
2. Cylinder (+1/32)	gm.	%
3. Jar (1/32—1/64)	gm.	%
4. Drain	gm.	%

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm		
¼–⅛ mm		
⅛–1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform ..... Sp. gr. Size–Grade(s) ..... mm.

Analyst

Date

Wt. of sample ..... gm. 100.0%

Heavy Minerals ..... gm. ..... %

Light Minerals ..... gm. ..... %

Shape Analysis:

A ..... %: a ..... %: C ..... %

r ..... %: R ..... %.

Minerals Identified; Heavy Concentrate	No. of Grains	Rel. %
Total		100%
Light Concentrate		
Total		100%

Classification Grouping: Absol. %

Primary Minerals: ..... %

Secondary Minerals: ..... %

Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W— 0151

Depth 1150 to 1190

No. samples used 1

Analyst P—

Date 7/19/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight . . . . . 20.24 gm. 100.0% : 2. Wt. of F. P. .....
3. Wt. after solution, with filter paper . . . . . 8.80 gm.
4. Less wt. F. P. (2) . . . 4.23 gm.
5. Wt. Insol. Residue (3 minus 4) . . . . . 4.57 gm. 22.6%
6. Wt. lost by solution (1 minus 5) . . . . . 15.67 gm. 77.4%
7. To balance (5 plus 6) . 20.24 gm. 100.0%

B. Subsidation:

1. Original Wt. . . . . gm. 100.0%
2. Cylinder (+1/32) gm. %
3. Jar (1/32—1/64) gm. %
4. Drain . . . . . gm. %

C. Screen Analysis 4.41

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm	4.03 .98	92.0
¼–⅛ mm	.14	3.2
⅛–1/16	.21	4.8
Pan		
Total	4.33	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform ..... Sp. gr. Size–Grade(s) ..... mm.

Analyst .....

Date .....

Wt. of sample . . . . gm. 100.0%

Heavy Minerals . . . . gm. %

Light Minerals . . . . gm. %

Shape Analysis:

A ..... %: a ..... %: C ..... %

r ..... %: R ..... %.

Minerals Identified; Heavy Concentrate	No. of Grains	Rel. %
Total		100%
Light Concentrate		
Total		100%

Classification Grouping: Absol. %

Primary Minerals: ..... %

Secondary Minerals: ..... %

Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W— 215

Depth 12 to 1220

No. samples used 1

Analyst P—

Date 7/19/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight	20.12 gm.	100.0%	2. Wt. of F. P.
3. Wt. after solution, with filter paper	20.79 gm.		
4. Less wt. F. P. (2)	4.24 gm.		
5. Wt. Insol. Residue (3 minus 4)	16.55 gm.	82.3 %	
6. Wt. lost by solution (1 minus 5)	3.57 gm.	17.7 %	
7. To balance (5 plus 6)	20.12 gm.	100.0 %	

B. Subsidation:

1. Original Wt.	16.55 gm.	100.0%	
2. Cylinder (+1/32) 6.0 −.4 4	3.7 gm.	22.8 %	
3. Jar (1/32—1/64) .32	1.76 gm.	11.8 %	
4. Drain	10.81 gm.	65.4 %	

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm		
¼–⅛ mm		
⅛–1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform ..... Sp. gr. Size–Grade(s) ..... mm.

Analyst .....

Date .....

Wt. of sample . . . . gm. 100.0%

Heavy Minerals . . . . gm. %

Light Minerals . . . . gm. %

Shape Analysis:

A ..... %: a ..... %: C ..... %

r ..... %: R ..... %.

Minerals Identified; Heavy Concentrate	No. of Grains	Rel. %
Total		100%
Light Concentrate		
Total		100%

Classification Grouping: Absol. %

Primary Minerals: ..... %

Secondary Minerals: ..... %

Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W— 0151

Depth 1230 to 1240

No. samples used

Analyst P—

Date 7/19/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight	20.46 gm.	100.0% : 2. Wt. of F. P.	
3. Wt. after solution, with filter paper	22.19 gm.		
4. Less wt. F. P. (2)	4.15 gm.		
5. Wt. Insol. Residue (3 minus 4)	18.04 gm.	88.2 %	
6. Wt. lost by solution (1 minus 5)	2.42 gm.	11.8 %	
7. To balance (5 plus 6)	20.46 gm.	100.0 %	

B. Subsidation:

1. Original Wt.	7.97	gm.	100.0%
2. Cylinder (+1/32)	2.30	gm.	31.4 %
3. Jar (1/32—1/64)	4.05 .25	gm.	12.5 %
4. Drain	1.012	gm.	56.1 %

C. Screen Analysis 5.54

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm	2.71	49.7
¼–⅛ mm	.05	.9
⅛–1/16	74	13.6
Pan	1.95	35.8
Total	5.45	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform ..... Sp. gr. Size–Grade(s) ..... mm.

Analyst

Date

Wt. of sample ..... gm. 100.0%

Heavy Minerals ..... gm. ..... %

Light Minerals ..... gm. ..... %

Shape Analysis:

A ..... %: a ..... %: C ..... %

r ..... %: R ..... %.

Minerals Identified; Heavy Concentrate	No. of Grains	Rel. %
Total		100%
Light Concentrate		
Total		100%

Classification Grouping: Absol. %

Primary Minerals: ..... %

Secondary Minerals: ..... %

Total 100%

Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W— 0151

Depth 1250 to 1260

No. samples used 1

Analyst P—

Date 7/19/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight . . . . . 20.10 gm. 100.0% : 2. Wt. of F. P. .....
3. Wt. after solution, with filter paper . . . . . 22.07 gm.
4. Less wt. F. P. (2) . . . 4.22 gm.
5. Wt. Insol. Residue (3 minus 4) . . . . . 17.85 gm. 89.0 %
6. Wt. lost by solution (1 minus 5) . . . . . 2.25 gm. 11.0 %
7. To balance (5 plus 6) . . 20.10 gm. 100.0 %

B. Subsidation:

1. Original Wt. . . . . 7.91 .85 gm. 100.0%
2. Cylinder (+1/32) 2.37 .54 gm. 31.0 %
3. Jar (1/32—1/64) 4.71 .42 gm. 13.4 %
4. Drain . . . . . 1.9 gm. 55.6 %

C. Screen Analysis 5.27

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm	2.41	46.4
¼–⅛ mm	.08	1.5
⅛–1/16	.86	16.6
Pan	.84	35.5
Total	5.19	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform ..... Sp. gr. Size–Grade(s) ..... mm.

Analyst .....

Date .....

Wt. of sample . . . . gm. 100.0%

Heavy Minerals . . . . gm. ..... %

Light Minerals . . . . gm. ..... %

Shape Analysis:

A ..... %: a ..... %: C ..... %

r ..... %: R ..... %.

Minerals Identified; Heavy Concentrate — No. of Grains — Rel. % — Absol. %

Classification Grouping:

Primary Minerals: ..... %

Total 100%

Light Concentrate

Secondary Minerals: ..... %

Total . . . . . 100% Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W— 0151

Depth 1270 to 1280

No. samples used 1

Analyst P—

Date 7/19/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight	20.24 gm.	100.0%	2. Wt. of F. P.	
3. Wt. after solution, with filter paper	19.34 gm.			
4. Less wt. F. P. (2)	4.12 gm.			
5. Wt. Insol. Residue (3 minus 4)	15.22 gm.	75.2%		
6. Wt. lost by solution (1 minus 5)	5.02 gm.	24.8%		
7. To balance (5 plus 6)	20.24 gm.	100.0%		

B. Subsidation:

1. Original Wt.	gm.	100.0%
2. Cylinder (+1/32)	gm.	%
3. Jar (1/32—1/64)	gm.	%
4. Drain	gm.	%

C. Screen Analysis 15.00

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm	12.19	14.7
¼–⅛ mm	4.25	28.6
⅛–1/16	7.05	47.3
Pan	1.40	9.4
Total	14.89	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform ..... Sp. gr. Size–Grade(s) ..... mm.

Analyst .....

Date .....

Wt. of sample ..... gm. 100.0% Shape Analysis:

Heavy Minerals ..... gm. ..... % A ..... %: a ..... %: C ..... %

Light Minerals ..... gm. ..... % r ..... %: R ..... %.

Minerals Identified; Heavy Concentrate	No. of Grains	Rel. %
Total		100%

Classification Grouping: Absol. %

Primary Minerals: ..... %

Secondary Minerals: ..... %

Light Concentrate

Total	100%	Total	100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W— 0151

Depth 1290 to 1300

No. samples used

Analyst P—

Date 7/19/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight	20.13	gm.	100.0%	2. Wt. of F. P.
3. Wt. after solution, with filter paper	14.85	gm.		
4. Less wt. F. P. (2)	4.28	gm.		
5. Wt. Insol. Residue (3 minus 4)	10.77	gm.	53.5 %	
6. Wt. lost by solution (1 minus 5)	9.36	gm.	46.5 %	
7. To balance (5 plus 6)	20.13	gm.	100.0 %	

B. Subsidation:

1. Original Wt.	77	gm.	100.0%	
2. Cylinder (+1/32) 5.27 2.40	7.67	gm.	26.7 %	
3. Jar (1/32—1/64) 3.20 2.23	9.7	gm.	9.0 %	
4. Drain	6.9	gm.	64.3 %	

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm		
¼–⅛ mm		
⅛–1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform ..... Sp. gr. Size–Grade(s) ..... mm.

Analyst

Date

Wt. of sample ..... gm. 100.0%

Heavy Minerals ..... gm. ..... %

Light Minerals ..... gm. ..... %

Shape Analysis:

A ..... %: a ..... %: C ..... %

r ..... %: R ..... %.

Minerals Identified; Heavy Concentrate	No. of Grains	Rel. %
Total		100%

Classification Grouping: Absol. %

Primary Minerals: ..... %

Secondary Minerals: ..... %

Light Concentrate		
Total		100%

Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W— 0151
Depth 1300 to 1310
No. samples used 1
Analyst P—
Date 7/19/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight	20.13 gm.	100.0%	2. Wt. of F. P.	
3. Wt. after solution, with filter paper	15.03 gm.			
4. Less wt. F. P. (2)	4.14 gm.			
5. Wt. Insol. Residue (3 minus 4)	10.89 gm.	54.0 %		
6. Wt. lost by solution (1 minus 5)	9.24 gm.	46.0 %		
7. To balance (5 plus 6)	20.13 gm.	100.0 %		

B. Subsidation:

1. Original Wt.	10.89 gm.	100.0%	
2. Cylinder (+1/32) 4.16 2.43 3.71	7.3 gm.	15.9 %	
3. Jar (1/32—1/64)	1.31 gm.	12.0 %	
4. Drain	7.85 gm.	72.1 %	

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm		
¼–⅛ mm		
⅛–1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform ..... Sp. gr. Size–Grade(s) ..... mm.

Analyst .....
Date .....

Wt. of sample ..... gm. 100.0%

Heavy Minerals ..... gm. ..... %

Light Minerals ..... gm. ..... %

Shape Analysis:

A ..... %: a ..... %: C ..... %

r ..... %: R ..... %.

Minerals Identified; Heavy Concentrate	No. of Grains	Rel. %
Total		100%

Classification Grouping: Absol. %

Primary Minerals: ..... %

Secondary Minerals: ..... %

Light Concentrate

Total 100%

Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W— 015 1
Depth 1320 to 1330
No. samples used 1
Analyst P—
Date 7/19/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight	20.16 gm.	100.0%	2. Wt. of F. P.	
3. Wt. after solution, with filter paper	14.07 gm.			
4. Less wt. F. P. (2)	4.16 gm.			
5. Wt. Insol. Residue (3 minus 4)	9.91 gm.	49.1 %		
6. Wt. lost by solution (1 minus 5)	10.25 gm.	50.9 %		
7. To balance (5 plus 6)	20.16 gm.	100.0 %		

B. Subsidation:

1. Original Wt.	9.91 gm.	100.0%	
2. Cylinder (+1/32) 5.34, 2.32, .40	3.02 gm.	30.4 %	
3. Jar (1/32—1/64) 29	1.11 gm.	11.2 %	
4. Drain	5.78 gm.	58.4 %	

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm		
¼–⅛ mm		
⅛–1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform ..... Sp. gr. Size–Grade(s) ..... mm.

Analyst .....
Date .....

Wt. of sample . . . . gm. 100.0%

Heavy Minerals . . . . gm. %

Light Minerals . . . . gm. %

Shape Analysis:

A ..... %: a ..... %: C ..... %

r ..... %: R ..... %.

Minerals Identified; Heavy Concentrate	No. of Grains	Rel. %
Total		100%

Classification Grouping: Absol. %

Primary Minerals: ..... %

Secondary Minerals: ..... %

Light Concentrate

Total 100%

Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W— 0151
Depth 1340 to 1350
No. samples used 1
Analyst P.—
Date 7/19/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight	20.13 gm.	100.0%	2. Wt. of F. P.	
3. Wt. after solution, with filter paper	18.71 gm.			
4. Less wt. F. P. (2)	4.12 gm.			
5. Wt. Insol. Residue (3 minus 4)	14.59 gm.	72.5 %		
6. Wt. lost by solution (1 minus 5)	5.54 gm.	27.5 %		
7. To balance (5 plus 6)	20.13 gm.	100.0 %		

B. Subsidation:

1. Original Wt.	14.59 gm.	100.0%	
2. Cylinder (+1/32)	8.56 / 2.4 / 4.11 gm.	42. %	
3. Jar (1/32—1/64)	3.45 / .26 gm.	11.4 %	
4. Drain	2.79 gm.	46.5 %	

C. Screen Analysis 6.11

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm	.13	5.2
¼–⅛ mm	.26	10.4
⅛–1/16	2.11	84.4
Pan		
Total	2.50	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform ..... Sp. gr. Size–Grade(s) ..... mm.

Analyst .....
Date .....

Wt. of sample . . . . gm. 100.0%

Heavy Minerals . . . . gm. %

Light Minerals . . . . gm. %

Shape Analysis:

A ..... %: a ..... %: C ..... %

r ..... %: R ..... %.

Minerals Identified; Heavy Concentrate	No. of Grains	Rel. %
Total		100%

Classification Grouping: Absol. %
Primary Minerals: ..... %

Light Concentrate

Secondary Minerals: ..... %

Total . . . . 100% Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W— 0151

Depth 1360 to 1370

No. samples used

Analyst P.—

Date 7/10/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight	20.26 gm.	100.0%	2. Wt. of F. P.	
3. Wt. after solution, with filter paper	12.47 gm.			
4. Less wt. F. P. (2)	4.14 gm.			
5. Wt. Insol. Residue (3 minus 4)	6.53 gm.	32.2 %		
6. Wt. lost by solution (1 minus 5)	13.73 gm.	67.8 %		
7. To balance (5 plus 6)	20.26 gm.	100.0 %		

B. Subsidation:

1. Original Wt.	5.37	gm.	100.0%
2. Cylinder (+1/32)	2.29 / 2.28	gm. 2.57	47.2 %
3. Jar (1/32—1/64)	2.20	gm.	8.3 %
4. Drain	.9	gm.	44.5 %

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm		
¼–⅛ mm		
⅛–1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform ..... Sp. gr. Size–Grade(s) ..... mm.

Analyst

Date

Wt. of sample ..... gm. 100.0%

Heavy Minerals ..... gm. ..... %

Light Minerals ..... gm. ..... %

Shape Analysis:

A ..... %: a ..... %: C ..... %

r ..... %: R ..... %.

Minerals Identified; Heavy Concentrate	No. of Grains	Rel. %
Total		100%

Classification Grouping: Absol. %

Primary Minerals: ..... %

Secondary Minerals: ..... %

Light Concentrate		
Total		100%

Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W— 0151

Depth 1380 to 1390

No. samples used 1

Analyst P.—

Date 7/19/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight	20.14 gm.	100.0%	2. Wt. of F. P.	
3. Wt. after solution, with filter paper	16.84 gm.			
4. Less wt. F. P. (2)	4.10 gm.			
5. Wt. Insol. Residue (3 minus 4)	12.74 gm.	63.3 %		
6. Wt. lost by solution (1 minus 5)	7.40 gm.	36.7 %		
7. To balance (5 plus 6)	0.14 gm.	100.0 %		

B. Subsidation:

1. Original Wt.	12.74 gm.	100.0%	
2. Cylinder (+1/32) 6.38 / 2.43	3.95 gm.	31.0 %	
3. Jar (1/32—1/64) 4.37 / 2.35	.02 gm.	15.8 %	
4. Drain	6.71 gm.	53.2 %	

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm		
¼–⅛ mm		
⅛–1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform ..... Sp. gr. Size–Grade(s) ..... mm.

Analyst .....

Date .....

Wt. of sample . . . . gm. 100.0%

Heavy Minerals . . . . gm. %

Light Minerals . . . . gm. %

Shape Analysis:

A ..... %: a ..... %: C ..... %

r ..... %: R ..... %.

Minerals Identified; Heavy Concentrate	No. of Grains	Rel. %
Total		100%

Classification Grouping: Absol. %

Primary Minerals: ..... %

Secondary Minerals: ..... %

Light Concentrate

Total 100%

Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W-- 6151
Depth 1410 to 1420
No. samples used 1
Analyst P—
Date 7/19/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight . . . . . 20.28 gm. 100.0% : 2. Wt. of F. P.
3. Wt. after solution, with filter paper . . . . . 4.59 gm.
4. Less wt. F. P. (2) . . . 2.31 gm.
5. Wt. Insol. Residue (3 minus 4) . . . . . 2.28 gm. 11.2 %
6. Wt. lost by solution (1 minus 5) . . . . . 18.00 gm. 88.8 %
7. To balance (5 plus 6) . . 20.28 gm. 100.0 %

B. Subsidation:

1. Original Wt. . . . . gm. 100.0%
2. Cylinder (+1/32) . . . . . gm. %
3. Jar (1/32—1/64) . . . . . gm. %
4. Drain . . . . . gm. %

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm		
¼–⅛ mm		
⅛–1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform } . . . . . Sp. gr. Size–Grade(s) . . . . . mm.

Analyst
Date

Wt. of sample . . . . gm. 100.0%

Heavy Minerals . . . . gm. %

Light Minerals . . . . gm. %

Shape Analysis:

A . . . . % : a . . . . % : C . . . . %

r . . . . % : R . . . . %.

Minerals Identified; Heavy Concentrate — No. of Grains — Rel. %

Classification Grouping: — Absol. %

Primary Minerals: . . . . %

Total 100%

Light Concentrate

Secondary Minerals: . . . . %

Total 100%

Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W— 015
Depth 1430 to 1440
No. samples used 1
Analyst P—
Date 7/19/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight . . . . . 20.24 gm. 100.0%: 2. Wt. of F. P. .....
3. Wt. after solution, with filter paper . . . . . 3.54 gm.
4. Less wt. F. P. (2) . . . 2.28 gm.
5. Wt. Insol. Residue (3 minus 4) . . . . . 1.26 gm. .....%
6. Wt. lost by solution (1 minus 5) . . . . . 18.98 gm. .....%
7. To balance (5 plus 6) . . . 20.24 gm. .....%

B. Subsidation:

1. Original Wt. . . . . gm. 100.0%
2. Cylinder (+1/32) . . . . . gm. .....%
3. Jar (1/32—1/64) . . . . . gm. .....%
4. Drain . . . . . gm. .....%

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm		
¼–⅛ mm		
⅛–1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform ..... Sp. gr. Size–Grade(s) ..... mm.

Analyst .....
Date .....

Wt. of sample . . . . gm. 100.0%

Heavy Minerals . . . . gm. .....%

Light Minerals . . . . gm. .....%

Shape Analysis:

A .....%: a .....%: C .....%

r .....%: R .....%.

Minerals Identified; Heavy Concentrate — No. of Grains — Rel. % — Absol. %

Classification Grouping:
Primary Minerals: .....%

Total 100%

Light Concentrate

Secondary Minerals: .....%

Total . . . . . 100% Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W— 0151

Depth 1450 to 1460

No. samples used 1

Analyst P—

Date 7/19/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight	17.31 gm.	100.0%	2. Wt. of F. P.
3. Wt. after solution, with filter paper	2.88 gm.		
4. Less wt. F. P. (2)	2.38 gm.		
5. Wt. Insol. Residue (3 minus 4)	.50 gm.	%	
6. Wt. lost by solution (1 minus 5)	.8 gm.	%	
7. To balance (5 plus 6)	1.31 gm.	%	

B. Subsidation:

1. Original Wt.	gm.	100.0%
2. Cylinder (+1/32)	gm.	%
3. Jar (1/32—1/64)	gm.	%
4. Drain	gm.	%

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm		
¼–⅛ mm		
⅛–1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform ..... Sp. gr. Size–Grade(s) ..... mm.

Analyst .....

Date .....

Wt. of sample . . . . gm. 100.0%

Heavy Minerals . . . . gm. %

Light Minerals . . . . gm. %

Shape Analysis:

A ..... %: a ..... %: C ..... %

r ..... %: R ..... %.

Minerals Identified; Heavy Concentrate — No. of Grains — Rel. %

Classification Grouping: Absol. %

Primary Minerals: ..... %

Total 100%

Light Concentrate

Secondary Minerals: ..... %

Total . . . . . 100% Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W— 0151

Depth 1470 to 1480

No. samples used 1

Analyst R—

Date 7/19/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight . . . . . 20.83 gm. 100.0% : 2. Wt. of F. P. .....
3. Wt. after solution, with filter paper . . . . . 2.86 gm.
4. Less wt. F. P. (2) . . . 2.37 gm.
5. Wt. Insol. Residue (3 minus 4) . . . . . .49 gm. ..... %
6. Wt. lost by solution (1 minus 5) . . . . . .034 gm. ..... %
7. To balance (5 plus 6) . . 20.83 gm. ..... %

B. Subsidation:

1. Original Wt. . . . . gm. 100.0%
2. Cylinder (+1/32) ..... gm. ..... %
3. Jar (1/32—1/64) ..... gm. ..... %
4. Drain . . . . gm. ..... %

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm		
¼–⅛ mm		
⅛–1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform ..... Sp. gr. Size–Grade(s) ..... mm.

Analyst .....

Date .....

Wt. of sample . . . . gm. 100.0%

Heavy Minerals . . . . gm. ..... %

Light Minerals . . . . gm. ..... %

Shape Analysis:

A ..... %: a ..... %: C ..... %

r ..... %: R ..... %.

Minerals Identified; Heavy Concentrate — No. of Grains — Rel. %

Classification Grouping: — Absol. %

Primary Minerals: ..... %

Total 100%

Light Concentrate

Secondary Minerals: ..... %

Total . . . . . 100% Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W— 0151

Depth 1490 to 1500

No. samples used 1

Analyst P—

Date 7/19/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight . . . . . 20.13 gm. 100.0% : 2. Wt. of F. P. .....
3. Wt. after solution, with filter paper . . . . . 2.77 gm.
4. Less wt. F. P. (2) . . . 2.26 gm.
5. Wt. Insol. Residue (3 minus 4) . . . . . 5 gm. .....%
6. Wt. lost by solution (1 minus 5) . . . . . 19.62 gm. .....%
7. To balance (5 plus 6) . . 0.13 gm. .....%

B. Subsidation:

1. Original Wt. . . . . gm. 100.0%
2. Cylinder (+1/32) ..... gm. .....%
3. Jar (1/32—1/64) ..... gm. .....%
4. Drain . . . . gm. .....%

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm		
¼–⅛ mm		
⅛–1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform ..... Sp. gr. Size–Grade(s) ..... mm.

Analyst .....

Date .....

Wt. of sample . . . . gm. 100.0%

Heavy Minerals . . . . gm. .....%

Light Minerals . . . . gm. .....%

Shape Analysis:

A .....%: a .....%: C .....%

r .....%: R .....%.

Minerals Identified: Heavy Concentrate — No. of Grains — Rel. % — Absol. %

Classification Grouping:

Primary Minerals: .....%

Total 100%

Light Concentrate

Secondary Minerals: .....%

Total . . . . . 100% Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W— 0151
Depth 1500 to 1510
No. samples used 1
Analyst P—
Date 2/19/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight . . . . . 20.18 gm. 100.0% : 2. Wt. of F. P. .....
3. Wt. after solution, with filter paper . . . . . 18.47 gm.
4. Less wt. F. P. (2) . . . . gm.
5. Wt. Insol. Residue (3 minus 4) . . . . . 18.47 gm. ..... %
6. Wt. lost by solution (1 minus 5) . . . . . 1.71 gm. ..... %
7. To balance (5 plus 6) . . 20.18 gm. ..... %

B. Subsidation:

1. Original Wt. . . . . gm. 100.0%
2. Cylinder (+1/32) ..... gm. ..... %
3. Jar (1/32—1/64) ..... gm. ..... %
4. Drain . . . . gm. ..... %

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm		
¼–⅛ mm		
⅛–1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform ..... Sp. gr. Size–Grade(s) ..... mm.

Analyst .....
Date .....

Wt. of sample . . . . gm. 100.0%

Heavy Minerals . . . . gm. ..... %

Light Minerals . . . . gm. ..... %

Shape Analysis:

A ..... % : a ..... % : C ..... %

r ..... % : R ..... %.

Minerals Identified: Heavy Concentrate — No. of Grains — Rel. %

Classification Grouping: — Absol. %

Primary Minerals: ..... %

Total 100%

Light Concentrate

Secondary Minerals: ..... %

Total . . . . . 100% Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W— 0151

Depth 1510 to 1530

No. samples used 2

Analyst D—

Date 7/19/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight . . . . . 20.59 gm. 100.0% : 2. Wt. of F. P. .....
3. Wt. after solution, with filter paper . . . . . 5.74 gm.
4. Less wt. F. P. (2) . . . 2.90 gm.
5. Wt. Insol. Residue (3 minus 4) . . . . . 2.84 gm. ..... %
6. Wt. lost by solution (1 minus 5) . . . . . 17.75 gm. ..... %
7. To balance (5 plus 6) . . 20.59 gm. ..... %

B. Subsidation:

1. Original Wt. . . . . gm. 100.0%
2. Cylinder (+1/32) ..... gm. ..... %
3. Jar (1/32—1/64) ..... gm. ..... %
4. Drain . . . . gm. ..... %

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm		
¼–⅛ mm		
⅛–1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform ..... Sp. gr. Size–Grade(s) ..... mm.

Analyst .....

Date .....

Wt. of sample . . . . gm. 100.0%

Heavy Minerals . . . . gm. ..... %

Light Minerals . . . . gm. ..... %

Shape Analysis:

A ..... %: a ..... %: C ..... %

r ..... %: R ..... %.

Minerals Identified: Heavy Concentrate	No. of Grains	Rel. %
Total		100%

Classification Grouping: Absol. %

Primary Minerals: ..... %

Secondary Minerals: ..... %

Light Concentrate		
Total		100%

Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W— 0151

Depth 1550 to 1560

No. samples used

Analyst P—

Date 7/19/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight . . . . . 20.12 gm. 100.0% : 2. Wt. of F. P.
3. Wt. after solution, with filter paper . . . . . 2.45 gm.
4. Less wt. F. P. (2) . . . gm.
5. Wt. Insol. Residue (3 minus 4) . . . . . gm. %
6. Wt. lost by solution (1 minus 5) . . . . . 17.98 gm. %
7. To balance (5 plus 6) . . gm. %

B. Subsidation:

1. Original Wt. . . . . gm. 100.0%
2. Cylinder (+1/32) gm. %
3. Jar (1/32—1/64) gm. %
4. Drain . . . . . gm. %

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm		
¼–⅛ mm		
⅛–1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform } Sp. gr. Size–Grade(s) mm.

Analyst

Date

Wt. of sample . . . . gm. 100.0%

Heavy Minerals . . . . gm. %

Light Minerals . . . . gm. %

Shape Analysis:

A %: a %: C %

r %: R %.

Minerals Identified:
Heavy Concentrate

No. of Grains | Rel. % | Absol. %

Classification Grouping:
Primary Minerals: %

Total 100%

Light Concentrate

Secondary Minerals: %

Total . . . . . 100% Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W— 0151

Depth 1560 to 1570

No. samples used

Analyst P—

Date 7/19/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight . . . . . 20.07 gm. 100.0% : 2. Wt. of F. P.
3. Wt. after solution, with filter paper . . . . . 4.25 gm.
4. Less wt. F. P. (2) . . . 2.34 gm.
5. Wt. Insol. Residue (3 minus 4) . . . . . .9 gm. %
6. Wt. lost by solution (1 minus 5) . . . . . 16.16 gm. %
7. To balance (5 plus 6) . . 20.0 gm. %

B. Subsidation:

1. Original Wt. . . . . gm. 100.0%
2. Cylinder (+1/32) gm. %
3. Jar (1/32—1/64) gm. %
4. Drain . . . . . gm. %

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm		
¼–⅛ mm		
⅛–1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform ..... Sp. gr. Size–Grade(s) ..... mm.

Analyst

Date

Wt. of sample . . . . gm. 100.0%

Heavy Minerals . . . . gm. %

Light Minerals . . . . gm. %

Shape Analysis:

A ..... %: a ..... %: C ..... %

r ..... %: R ..... %.

Minerals Identified; Heavy Concentrate — No. of Grains — Rel. %

Classification Grouping: — Absol. %

Primary Minerals: ..... %

Total 100%

Light Concentrate

Secondary Minerals: ..... %

Total . . . . . 100% Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W— 2151

Depth 1590 to 1600

No. samples used

Analyst P—

Date 7/19/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight	20.39 gm.	100.0%	2. Wt. of F. P.
3. Wt. after solution, with filter paper	2.3 gm.		
4. Less wt. F. P. (2)	.39 gm.		
5. Wt. Insol. Residue (3 minus 4)	1.74 gm.	%	
6. Wt. lost by solution (1 minus 5)	18.65 gm.	%	
7. To balance (5 plus 6)	20.39 gm.	%	

B. Subsidation:

1. Original Wt.	gm.	100.0%
2. Cylinder (+1/32)	gm.	%
3. Jar (1/32—1/64)	gm.	%
4. Drain	gm.	%

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm		
¼–⅛ mm		
⅛–1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform ..... Sp. gr. Size–Grade(s) ..... mm.

Analyst

Date

Wt. of sample ..... gm. 100.0%

Heavy Minerals ..... gm. ..... %

Light Minerals ..... gm. ..... %

Shape Analysis:

A ..... %: a ..... %: C ..... %

r ..... %: R ..... %.

Minerals Identified:
Heavy Concentrate

No. of Grains	Rel. %
Total	100%

Classification Grouping: Absol. %

Primary Minerals: ..... %

Secondary Minerals: ..... %

Light Concentrate

Total	100%

Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W— 9151

Depth 1610 to 1620

No. samples used 1

Analyst P—

Date 7/20/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight . . . . . 20.19 gm. 100.0% : 2. Wt. of F. P. .....
3. Wt. after solution, with filter paper . . . . . 5.93 gm.
4. Less wt. F. P. (2) . . . 2.28 gm.
5. Wt. Insol. Residue (3 minus 4) . . . . . 3.65 gm. .....%
6. Wt. lost by solution (1 minus 5) . . . . . 16.54 gm. .....%
7. To balance (5 plus 6) . . 20.19 gm. .....%

B. Subsidation:

1. Original Wt. . . . . gm. 100.0%
2. Cylinder (+1/32) ..... gm. .....%
3. Jar (1/32—1/64) ..... gm. .....%
4. Drain . . . . gm. .....%

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm		
¼–⅛ mm		
⅛–1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform ..... Sp. gr. Size–Grade(s) ..... mm.

Analyst .....

Date .....

Wt. of sample . . . . gm. 100.0%

Heavy Minerals . . . . gm. .....%

Light Minerals . . . . gm. .....%

Shape Analysis:

A .....%: a .....%: C .....%

r .....%: R .....%.

Minerals Identified; Heavy Concentrate — No. of Grains — Rel. %

Classification Grouping: — Absol. %

Primary Minerals: .....%

Total 100%

Light Concentrate

Secondary Minerals: .....%

Total . . . . . 100% Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W— 015
Depth 1630 to 1640
No. samples used 1
Analyst P. —
Date 7/30/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight . . . . . 20.29 gm. 100.0% : 2. Wt. of F. P. .....
3. Wt. after solution, with filter paper . . . . . 5.58 gm.
4. Less wt. F. P. (2) . . . 2.38 gm.
5. Wt. Insol. Residue (3 minus 4) . . . . . 3.20 gm. ..... %
6. Wt. lost by solution (1 minus 5) . . . . . 17.09 gm. ..... %
7. To balance (5 plus 6) . . 20.29 gm. ..... %

B. Subsidation:

1. Original Wt. . . . . gm. 100.0%
2. Cylinder (+1/32) gm. ..... %
3. Jar (1/32—1/64) gm. ..... %
4. Drain . . . . . gm. ..... %

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm		
¼–⅛ mm		
⅛–1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform ..... Sp. gr. Size–Grade(s) ..... mm.

Analyst .....
Date .....

Wt. of sample . . . . gm. 100.0%

Heavy Minerals . . . . gm. ..... %

Light Minerals . . . . gm. ..... %

Shape Analysis:

A ..... %: a ..... %: C ..... %

r ..... %: R ..... %.

Minerals Identified; Heavy Concentrate — No. of Grains — Rel. %

Classification Grouping: — Absol. %

Primary Minerals: ..... %

Total 100%

Light Concentrate

Secondary Minerals: ..... %

Total 100%

Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W— 0151

Depth 1660 to 1670

No. samples used 1

Analyst P. —

Date 7/20/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight	20.20 gm.	100.0%	2. Wt. of F. P.	
3. Wt. after solution, with filter paper	5.70 gm.			
4. Less wt. F. P. (2)	3.42 gm.			
5. Wt. Insol. Residue (3 minus 4)	2.28 gm.	%		
6. Wt. lost by solution (1 minus 5)	16.92 gm.	%		
7. To balance (5 plus 6)	20.20 gm.	%		

B. Subsidation:

1. Original Wt.	gm.	100.0%
2. Cylinder (+1/32)	gm.	%
3. Jar (1/32—1/64)	gm.	%
4. Drain	gm.	%

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm		
¼–⅛ mm		
⅛–1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform ..... Sp. gr. Size–Grade(s) ..... mm.

Analyst .....

Date .....

Wt. of sample . . . . gm. 100.0%

Heavy Minerals . . . . gm. %

Light Minerals . . . . gm. %

Shape Analysis:

A ..... %: a ..... %: C ..... %

r ..... %: R ..... %.

Minerals Identified; Heavy Concentrate	No. of Grains	Rel. %
Total		100%
Light Concentrate		
Total		100%

Classification Grouping: Absol. %

Primary Minerals: ..... %

Secondary Minerals: ..... %

Total 100%

Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W— 0151

Depth 1620 to 1690

No. samples used 1

Analyst P—

Date 7/20/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight . . . . . 20.19 gm. 100.0% : 2. Wt. of F. P. .....
3. Wt. after solution, with filter paper . . . . . 4.64 gm.
4. Less wt. F. P. (2) . . . 1.30 gm.
5. Wt. Insol. Residue (3 minus 4) . . . . . 3.34 gm. ..... %
6. Wt. lost by solution (1 minus 5) . . . . . 17.85 gm. ..... %
7. To balance (5 plus 6) . . 20.19 gm. ..... %

B. Subsidation:

1. Original Wt. . . . . gm. 100.0%
2. Cylinder (+1/32) . . . . . gm. ..... %
3. Jar (1/32—1/64) . . . . . gm. ..... %
4. Drain . . . . . gm. ..... %

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm		
¼–⅛ mm		
⅛–1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform ..... Sp. gr. Size–Grade(s) ..... mm.

Analyst .....

Date .....

Wt. of sample . . . . gm. 100.0%

Heavy Minerals . . . . gm. ..... %

Light Minerals . . . . gm. ..... %

Shape Analysis:

A ..... % : a ..... % : C ..... %

r ..... % : R ..... %.

Minerals Identified: Heavy Concentrate — No. of Grains — Rel. %

Classification Grouping: — Absol. %

Primary Minerals: ..... %

Total 100%

Light Concentrate

Secondary Minerals: ..... %

Total . . . . . 100% Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W—0151
Depth 1690 to 1700
No. samples used 1
Analyst P—
Date 9/29/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight . . . . . 20.45 gm. 100.0% : 2. Wt. of F. P. .....
3. Wt. after solution, with filter paper . . . . . 15.98 gm.
4. Less wt. F. P. (2) . . . 2.41 gm.
5. Wt. Insol. Residue (3 minus 4) . . . . . 13.57 gm. ..... %
6. Wt. lost by solution (1 minus 5) . . . . . 88 gm. ..... %
7. To balance (5 plus 6) . . 45 gm. ..... %

B. Subsidation:

1. Original Wt. . . . . 13.57 gm. 100.0%
2. Cylinder (+1/32) 4.03 2.40 1.63 gm. ..... %
3. Jar (1/32—1/64) 1.41 gm. ..... %
4. Drain . . . . . 10.53 gm. ..... %

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm		
¼–⅛ mm		
⅛–1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform ..... Sp. gr. Size–Grade(s) ..... mm.

Analyst .....
Date .....

Wt. of sample . . . . gm. 100.0%

Heavy Minerals . . . . gm. ..... %

Light Minerals . . . . gm. ..... %

Shape Analysis:

A ..... %: a ..... %: C ..... %

r ..... %: R ..... %.

Minerals Identified: Heavy Concentrate — No. of Grains — Rel. % — Absol. %

Classification Grouping:
Primary Minerals: ..... %

Total 100%

Light Concentrate

Secondary Minerals: ..... %

Total . . . . . 100% Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Screen

Well No. W— 0151

Depth 1710 to 1720

No. samples used 1

Analyst D—

Date 7/20/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl.....%)

1. Sample weight . . . . . 20.09 gm. 100.0%: 2. Wt. of F. P.....
3. Wt. after solution, with filter paper . . . .gm.
4. Less wt. F. P. (2) . . . .gm.
5. Wt. Insol. Residue (3 minus 4) . . . .gm.....%
6. Wt. lost by solution (1 minus 5) . . . .gm.....%
7. To balance (5 plus 6) . . ..gm.....%

B. Subsidation:

1. Original Wt. . . . .gm..... 100.0%
2. Cylinder (+1/32) .....gm.....%
3. Jar (1/32—1/64) .....gm.....%
4. Drain . . . .gm.....%

C. Screen Analysis

SIZE	GRAMS	%
2 ~~plus~~		
~~2–1 mm~~		
1–½ mm	.13	
½–¼ mm	5.26	
¼–⅛ mm	8.53	
⅛–1/16	4.91	
Pan	.18	
Total	20.01	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform } .....Sp. gr. Size–Grade(s).....mm.

Analyst .....

Date .....

Wt. of sample . . . .gm..... 100.0%

Heavy Minerals . . . .gm.....%

Light Minerals . . . .gm.....%

Shape Analysis:

A.....%: a.....%: C.....%

r .....%: R .....%.

Minerals Identified; Heavy Concentrate — No. of Grains — Rel. %

Classification Grouping: — Absol. %

Primary Minerals: .....%

Total 100%

Light Concentrate

Secondary Minerals: .....%

Total . . . . . 100% Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Scree

Well No. W— 0151

Depth 1720 to 1730

No. samples used 1

Analyst P—

Date 7/20/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl.....%)

1. Sample weight . . . . . 20.09 gm. 100.0% : 2. Wt. of F. P.....
3. Wt. after solution, with filter paper . . . .gm.
4. Less wt. F. P. (2) . . . .gm.
5. Wt. Insol. Residue (3 minus 4) . . . .gm.....%
6. Wt. lost by solution (1 minus 5) . . . .gm.....%
7. To balance (5 plus 6) . . ..gm.....%

B. Subsidation:

1. Original Wt. . . . .gm..... 100.0%
2. Cylinder (+1/32) .....gm.....%
3. Jar (1/32—1/64) .....gm.....%
4. Drain . . . .gm.....%

C. Screen Analysis

SIZE	GRAMS	%
~~2 plus~~		
2–1 mm	.22	
1–½ mm	.47	
½–¼ mm	9.78	
¼–⅛ mm	6.88	
⅛–1/16	1.85	
Pan	.84	
Total	20.04	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform .....Sp. gr. Size–Grade(s).....mm.

Analyst .....

Date .....

Wt. of sample . . . .gm..... 100.0%

Heavy Minerals . . . .gm.....%

Light Minerals . . . .gm.....%

Shape Analysis:

A.....%: a.....%: C.....%

r .....%: R .....%.

Minerals Identified; Heavy Concentrate — No. of Grains — Rel. %

Classification Grouping: — Absol. %

Primary Minerals: .....%

Total 100%

Light Concentrate

Secondary Minerals: .....%

Total 100%

Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W— 0151

Depth 740 to 1750

No. samples used 1

Analyst P. —

Date 7/20/55

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight	20.15 gm.	100.0%	2. Wt. of F. P.
3. Wt. after solution, with filter paper	8.09 gm.		
4. Less wt. F. P. (2)	2.23 gm.		
5. Wt. Insol. Residue (3 minus 4)	5.86 gm.	%	
6. Wt. lost by solution (1 minus 5)	14.29 gm.	%	
7. To balance (5 plus 6)	20.15 gm.	%	

B. Subsidation:

1. Original Wt.	5.86 gm.	100.0%	
2. Cylinder (+1/32) 7.74 2.37 2.76	5.37 gm.	%	
3. Jar (1/32—1/64) 2.36	.10 gm.	%	
4. Drain	.39 gm.	%	

C. Screen Analysis 5.34

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm	.38	
½–¼ mm	1.72	
¼–⅛ mm	2.28	
⅛–1/16	.74	
Pan	.20	
Total	5.32	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform ..... Sp. gr. Size–Grade(s) ..... mm.

Analyst .....

Date .....

Wt. of sample . . . . gm. 100.0%

Heavy Minerals . . . . gm. %

Light Minerals . . . . gm. %

Shape Analysis:

A ..... %: a ..... %: C ..... %

r ..... %: R ..... %.

Minerals Identified; Heavy Concentrate	No. of Grains	Rel. %
Total		100%

Classification Grouping: Absol. %

Primary Minerals: ..... %

Secondary Minerals: ..... %

Light Concentrate

Total . . . . 100% Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W— 215
Depth 1760 to 1770
No. samples used
Analyst P.—
Date 7/20/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight . . . . . 20.09 gm. 100.0% : 2. Wt. of F. P.
3. Wt. after solution, with filter paper . . . . . 19.96 gm.
4. Less wt. F. P. (2) . . . 19.81 gm.
5. Wt. Insol. Residue (3 minus 4) . . . . . 8.68 gm. %
6. Wt. lost by solution (1 minus 5) . . . . . 1 gm. %
7. To balance (5 plus 6) . . 0.09 gm. %

B. Subsidation:

1. Original Wt. . . . . 8.68 gm. 100.0%
2. Cylinder (+1/32) 10.06 2.40 7.66 gm. %
3. Jar (1/32—1/64) 2.61 2.40 .21 gm. %
4. Drain . . . . . .81 gm. %

C. Screen Analysis 7.64

SIZE	GRAMS	%
~~2 plus~~		
~~2–1 mm~~		
1–½ mm	23	
½–¼ mm	1.25	
¼–⅛ mm	2.97	
⅛–1/16	1.82	
Pan	1.37	
Total	7.64	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform / ..... Sp. gr. Size–Grade(s) ..... mm.

Analyst
Date

Wt. of sample . . . . gm. 100.0%

Heavy Minerals . . . . gm. %

Light Minerals . . . . gm. %

Shape Analysis:

A %: a %: C %

r %: R %.

Minerals Identified; Heavy Concentrate — No. of Grains — Rel. %

Classification Grouping: — Absol. %

Primary Minerals: %

Total 100%

Light Concentrate

Secondary Minerals: %

Total . . . . . 100% Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W— 0151

Depth 1780 to 1790

No. samples used

Analyst P

Date 7/20/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight . . . . . 12.11 gm. 100.0% : 2. Wt. of F. P.
3. Wt. after solution, with filter paper . . . . . 4.16 gm.
4. Less wt. F. P. (2) . . . 2.39 gm.
5. Wt. Insol. Residue (3 minus 4) . . . . . 1.77 gm. %
6. Wt. lost by solution (1 minus 5) . . . . . 2.34 gm. %
7. To balance (5 plus 6) . . 12.11 gm. %

B. Subsidation:

1. Original Wt. . . . . gm. 100.0%
2. Cylinder (+1/32) gm. %
3. Jar (1/32—1/64) gm. %
4. Drain . . . . . gm. %

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm		
¼–⅛ mm		
⅛–1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform ..... Sp. gr. Size–Grade(s) ..... mm.

Analyst

Date

Wt. of sample . . . . gm. 100.0%

Heavy Minerals . . . . gm. %

Light Minerals . . . . gm. %

Shape Analysis:

A ..... %: a ..... %: C ..... %

r ..... %: R ..... %.

Minerals Identified; Heavy Concentrate — No. of Grains — Rel. % — Absol. %

Classification Grouping:

Primary Minerals: ..... %

Total 100%

Light Concentrate

Secondary Minerals: ..... %

Total 100%

Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W— 0151

Depth 1800 to 1810

No. samples used 1

Analyst P

Date 7/20/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl ..... 15 %)

1. Sample weight . . . . . 20.73 gm. 100.0% : 2. Wt. of F. P. .....
3. Wt. after solution, with filter paper . . . . . 9.2 gm.
4. Less wt. F. P. (2) . . . . gm.
5. Wt. Insol. Residue (3 minus 4) . . . . . 7 gm. ..... %
6. Wt. lost by solution (1 minus 5) . . . . . 3.12 gm. ..... %
7. To balance (5 plus 6) . . 207 gm. ..... %

B. Subsidation:

1. Original Wt. . . . . gm. 100.0%
2. Cylinder (+1/32) ..... gm. ..... %
3. Jar (1/32—1/64) ..... gm. ..... %
4. Drain . . . . gm. ..... %

C. Screen Analysis 6.78

SIZE	GRAMS	%
~~2 plus~~		
~~2–1 mm~~		
1–½ mm	.05	
½–¼ mm	.80	
¼–⅛ mm	3.35	
⅛–1/16	2.10	
Pan	.49	
Total	6.79	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform ..... Sp. gr. Size–Grade(s) ..... mm.

Analyst .....

Date .....

Wt. of sample . . . . gm. 100.0%

Heavy Minerals . . . . gm. ..... %

Light Minerals . . . . gm. ..... %

Shape Analysis:

A ..... %: a ..... %: C ..... %

r ..... %: R ..... %.

Minerals Identified; Heavy Concentrate	No. of Grains	Rel. %
Total		100%

Classification Grouping: Absol. %

Primary Minerals: ..... %

Secondary Minerals: ..... %

Light Concentrate

Total 100%

Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W— 0151
Depth 1820 to 1830
No. samples used 1
Analyst P—
Date 7/20/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight . . . . . 20.36 gm. 100.0% : 2. Wt. of F. P. .....
3. Wt. after solution, with filter paper . . . . . 8.33 gm.
4. Less wt. F. P. (2) . . . 2.41 gm.
5. Wt. Insol. Residue (3 minus 4) . . . . . 5.92 gm. ..... %
6. Wt. lost by solution (1 minus 5) . . . . . 14.44 gm. ..... %
7. To balance (5 plus 6) . . 2 gm. ..... %

B. Subsidation:

1. Original Wt. . . . . 5.92 gm. 100.0%
2. Cylinder (+1/32) 1.45 5.24 gm. ..... %
3. Jar (1/32—1/64) 2.73 .13 gm. ..... %
4. Drain . . . . . .75 gm. ..... %

C. Screen Analysis 5.01

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm	.05	
½–¼ mm	1.14	
¼–⅛ mm	2.09	
⅛–1/16	.21	
Pan	.54	
Total	5.03	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform ..... Sp. gr. Size–Grade(s) ..... mm.

Analyst .....
Date .....

Wt. of sample . . . . gm. 100.0%

Heavy Minerals . . . . gm. ..... %

Light Minerals . . . . gm. ..... %

Shape Analysis:

A ..... %: a ..... %: C ..... %

r ..... %: R ..... %.

Minerals Identified; Heavy Concentrate	No. of Grains	Rel. %
Total		100%

Classification Grouping: Absol. %
Primary Minerals: ..... %

Secondary Minerals: ..... %

Light Concentrate

Total . . . . . 100% Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W— 015

Depth 1840 to 1850

No. samples used

Analyst P—

Date 7/20/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight	20.31 gm.	100.0%	2. Wt. of F. P.
3. Wt. after solution, with filter paper	4.71 gm.		
4. Less wt. F. P. (2)	2.4 gm.		
5. Wt. Insol. Residue (3 minus 4)	2.30 gm.	%	
6. Wt. lost by solution (1 minus 5)	8.01 gm.	%	
7. To balance (5 plus 6)	? gm.	%	

B. Subsidation:

1. Original Wt.	gm.	100.0%
2. Cylinder (+1/32)	gm.	%
3. Jar (1/32—1/64)	gm.	%
4. Drain	gm.	%

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm		
¼–⅛ mm		
⅛–1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Analyst

Date

Acet. Tetrabr. / Bromoform ..... Sp. gr. Size–Grade(s) ..... mm.

Wt. of sample ..... gm. 100.0%

Heavy Minerals ..... gm. ..... %

Light Minerals ..... gm. ..... %

Shape Analysis:

A ..... %: a ..... %: C ..... %

r ..... %: R ..... %.

Minerals Identified; Heavy Concentrate	No. of Grains	Rel. %
Total		100%
Light Concentrate		
Total		100%

Classification Grouping: Absol. %

Primary Minerals: ..... %

Secondary Minerals: ..... %

Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W— 0151

Depth 1260 to 1270

No. samples used 1

Analyst P. —

Date 7/20/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 5 %)

1. Sample weight . . . . . 20.63 gm. 100.0% : 2. Wt. of F. P. .....
3. Wt. after solution, with filter paper . . . . . 5.17 gm.
4. Less wt. F. P. (2) . . . 2.32 gm.
5. Wt. Insol. Residue (3 minus 4) . . . . . 2.85 gm. ..... %
6. Wt. lost by solution (1 minus 5) . . . . . 17.78 gm. ..... %
7. To balance (5 plus 6) . . 0.63 gm. ..... %

B. Subsidation:

1. Original Wt. . . . . gm. 100.0%
2. Cylinder (+1/32) gm. ..... %
3. Jar (1/32—1/64) gm. ..... %
4. Drain . . . . . gm. ..... %

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm		
¼–⅛ mm		
⅛–1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform ..... Sp. gr. Size–Grade(s) ..... mm.

Analyst .....

Date .....

Wt. of sample . . . . gm. 100.0%

Heavy Minerals . . . . gm. ..... %

Light Minerals . . . . gm. ..... %

Shape Analysis:

A ..... %: a ..... %: C ..... %

r ..... %: R ..... %.

Minerals Identified; Heavy Concentrate — No. of Grains — Rel. % — Absol. %

Classification Grouping:

Primary Minerals: ..... %

Total 100%

Light Concentrate

Secondary Minerals: ..... %

Total . . . . . 100% Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W-- 0151

Depth 1870 to 1880

No. samples used 1

Analyst R—

Date 7/20/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight	20.1 gm.	100.0%	2. Wt. of F. P.
3. Wt. after solution, with filter paper	17.77 gm.		
4. Less wt. F. P. (2)	2.26 gm.		
5. Wt. Insol. Residue (3 minus 4)	15.51 gm.	%	
6. Wt. lost by solution (1 minus 5)	4.6 gm.	%	
7. To balance (5 plus 6)	20.17 gm.	%	

B. Subsidation:

1. Original Wt.	gm.	100.0%
2. Cylinder (+1/32)	gm.	%
3. Jar (1/32—1/64)	gm.	%
4. Drain	gm.	%

C. Screen Analysis 5.38

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm	.88	
½–¼ mm	10.32	
¼–⅛ mm	3.23	
⅛–1/16	.67	
Pan	.32	
Total	15.42	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform ..... Sp. gr. Size–Grade(s) ..... mm.

Analyst .....

Date .....

Wt. of sample ..... gm. 100.0%

Heavy Minerals ..... gm. ..... %

Light Minerals ..... gm. ..... %

Shape Analysis:

A ..... %: a ..... %: C ..... %

r ..... %: R ..... %.

Minerals Identified; Heavy Concentrate	No. of Grains	Rel. %
Total		100%
Light Concentrate		
Total		100%

Classification Grouping: Absol. %

Primary Minerals: ..... %

Secondary Minerals: ..... %

Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W— 0151

Depth 1880 to 1890

No. samples used

Analyst R—

Date 7/20/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight . . . . . 20.08 gm. 100.0% : 2. Wt. of F. P.
3. Wt. after solution, with filter paper . . . . . 4 gm.
4. Less wt. F. P. (2) . . . 2.6 gm.
5. Wt. Insol. Residue (3 minus 4) . . . . . 57 gm. %
6. Wt. lost by solution (1 minus 5) . . . . . 17.51 gm. %
7. To balance (5 plus 6) . . 0.08 gm. %

B. Subsidation:

1. Original Wt. . . . . gm. 100.0%
2. Cylinder (+1/32) gm. %
3. Jar (1/32—1/64) gm. %
4. Drain . . . . . gm. %

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm		
¼–⅛ mm		
⅛–1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform ..... Sp. gr. Size–Grade(s) ..... mm.

Analyst

Date

Wt. of sample . . . . gm. 100.0%

Heavy Minerals . . . . gm. %

Light Minerals . . . . gm. %

Shape Analysis:

A ..... %: a ..... %: C ..... %

r ..... %: R ..... %.

Minerals Identified; Heavy Concentrate — No. of Grains — Rel. %

Total 100%

Light Concentrate

Classification Grouping: — Absol. %

Primary Minerals: ..... %

Secondary Minerals: ..... %

Total 100%

Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W— 0151

Depth 1930 to 1940

No. samples used

Analyst D

Date 7/24/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight . . . . . 20.23 gm. 100.0%: 2. Wt. of F. P.
3. Wt. after solution, with filter paper . . . . . 9.80 gm.
4. Less wt. F. P. (2) . . . 6 gm.
5. Wt. Insol. Residue (3 minus 4) . . . . . 7.54 gm. %
6. Wt. lost by solution (1 minus 5) . . . . . 69 gm. %
7. To balance (5 plus 6) . . 2.63 gm. %

B. Subsidation:

1. Original Wt. . . . . gm. 100.0%
2. Cylinder (+1/32) gm. %
3. Jar (1/32—1/64) gm. %
4. Drain . . . . . gm. %

C. Screen Analysis 17.50

SIZE	GRAMS	%
~~2 plus~~		
2–1 mm	.05	
1–½ mm	.79	
½–¼ mm	9.53	
¼–⅛ mm	5.07	
⅛–1/16	.76	
Pan	.25	
Total	17.45	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform } Sp. gr. Size–Grade(s) mm.

Analyst

Date

Wt. of sample . . . . gm. 100.0%

Heavy Minerals . . . . gm. %

Light Minerals . . . . gm. %

Shape Analysis:

A %: a %: C %

r %: R %.

Minerals Identified; Heavy Concentrate | No. of Grains | Rel. % | Classification Grouping: Primary Minerals: % | Absol. %

Total 100%

Light Concentrate

Secondary Minerals: %

Total . . . . . 100% Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W— 0151

Depth 1940 to 1950

No. samples used 1

Analyst P.T.

Date 1/20/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight . . . . . 20.44 gm. 100.0%: 2. Wt. of F. P. .....
3. Wt. after solution, with filter paper . . . . . 4.94 gm.
4. Less wt. F. P. (2) . . . 3 gm.
5. Wt. Insol. Residue (3 minus 4) . . . . . 12.55 gm. .....%
6. Wt. lost by solution (1 minus 5) . . . . . 7.89 gm. .....%
7. To balance (5 plus 6) . . 20.44 gm. .....%

B. Subsidation:

1. Original Wt. . . . . gm. 100.0%
2. Cylinder (+1/32) gm. .....%
3. Jar (1/32—1/64) gm. .....%
4. Drain . . . . . gm. .....%

C. Screen Analysis 12,52

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm	.03	
½–¼ mm	.38	
¼–⅛ mm	8.76	
⅛–1/16	2.14	
Pan	.22	
Total	12,53	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform ..... Sp. gr. Size–Grade(s) ..... mm.

Analyst .....

Date .....

Wt. of sample . . . . gm. 100.0%

Heavy Minerals . . . . gm. .....%

Light Minerals . . . . gm. .....%

Shape Analysis:

A .....%: a .....%: C .....%

r .....%: R .....%.

Minerals Identified: Heavy Concentrate	No. of Grains	Rel. %
Total		100%
Light Concentrate		
Total		100%

Classification Grouping: Absol. %

Primary Minerals: .....%

Secondary Minerals: .....%

Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

Well No. W—

Depth 1950 to 1960

No. samples used 1

Analyst W—

Date 7/29/35

A. Acid treatment (HCl 15 %)

1. Sample weight . . . . . 20.02 gm. 100.0%: 2. Wt. of F. P. .....
3. Wt. after solution, with filter paper . . . . . 13.95 gm.
4. Less wt. F. P. (2) . . . 2.35 gm.
5. Wt. Insol. Residue (3 minus 4) . . . . . 11.60 gm. .....%
6. Wt. lost by solution (1 minus 5) . . . . . 8.42 gm. .....%
7. To balance (5 plus 6) . . 02 gm. .....%

B. Subsidation:

1. Original Wt. . . . .gm. 100.0%
2. Cylinder (+1/32) .....gm. .....%
3. Jar (1/32—1/64) .....gm. .....%
4. Drain . . . .gm. .....%

C. Screen Analysis 11.52

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm	.03	
½–¼ mm	.06	
¼–⅛ mm	7.82	
⅛–1/16	2.41	
Pan	.22	
Total	11.54	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform } .....Sp. gr. Size–Grade(s) .....mm.

Analyst .....

Date .....

Wt. of sample . . . .gm. 100.0%

Heavy Minerals . . . .gm. .....%

Light Minerals . . . .gm. .....%

Shape Analysis:

A.....%: a.....%: C.....%

r .....%: R .....%.

Minerals Identified; Heavy Concentrate	No. of Grains	Rel. %
Total		100%

Classification Grouping: Absol. %

Primary Minerals: .....%

Light Concentrate

Secondary Minerals: .....%

Total . . . . . 100% Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W— 2151

Depth 1893 to 2000

No. samples used

Analyst D—

Date 7/29/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight	20.07 gm.	100.0%	2. Wt. of F. P.
3. Wt. after solution, with filter paper	3.02 gm.		
4. Less wt. F. P. (2)	2.28 gm.		
5. Wt. Insol. Residue (3 minus 4)	.74 gm.	%	
6. Wt. lost by solution (1 minus 5)	19.33 gm.	%	
7. To balance (5 plus 6)	2.07 gm.	%	

B. Subsidation:

1. Original Wt.	gm.	100.0%
2. Cylinder (+1/32)	gm.	%
3. Jar (1/32—1/64)	gm.	%
4. Drain	gm.	%

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm		
¼–⅛ mm		
⅛–1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform ..... Sp. gr. Size–Grade(s) ..... mm.

Analyst

Date

Wt. of sample ..... gm. 100.0%

Heavy Minerals ..... gm. %

Light Minerals ..... gm. %

Shape Analysis:

A ..... %: a ..... %: C ..... %

r ..... %: R ..... %.

Minerals Identified; Heavy Concentrate	No. of Grains	Rel. %
Total		100%

Classification Grouping: Absol. %

Primary Minerals: ..... %

Secondary Minerals: ..... %

Light Concentrate		
Total		100%

Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W— 0151

Depth 2010 to 2020

No. samples used 1

Analyst P—

Date 7/20/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 5 %)

1. Sample weight	20.11 gm.	100.0% : 2. Wt. of F. P.	
3. Wt. after solution, with filter paper	2.85 gm.		
4. Less wt. F. P. (2)	2.30 gm.		
5. Wt. Insol. Residue (3 minus 4)	.55 gm.	%	
6. Wt. lost by solution (1 minus 5)	19.56 gm.	%	
7. To balance (5 plus 6)	20.11 gm.	%	

B. Subsidation:

1. Original Wt.	gm.	100.0%
2. Cylinder (+1/32)	gm.	%
3. Jar (1/32—1/64)	gm.	%
4. Drain	gm.	%

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm		
¼–⅛ mm		
⅛–1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform ..... Sp. gr. Size–Grade(s) ..... mm.

Analyst .....

Date .....

Wt. of sample ..... gm. 100.0%

Heavy Minerals ..... gm. ..... %

Light Minerals ..... gm. ..... %

Shape Analysis:

A ..... %: a ..... %: C ..... %

r ..... %: R ..... %.

Minerals Identified; Heavy Concentrate	No. of Grains	Rel. %
Total		100%

Classification Grouping: Absol. %

Primary Minerals: ..... %

Secondary Minerals: ..... %

Light Concentrate

Total		Total	100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W— 0151

Depth 2030 to 2040

No. samples used 1

Analyst R—

Date 7/29/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight . . . . . 20.84 gm. 100.0%: 2. Wt. of F. P. .....
3. Wt. after solution, with filter paper . . . . . 15.44 gm.
4. Less wt. F. P. (2) . . . .3 gm.
5. Wt. Insol. Residue (3 minus 4) . . . . . 13.13 gm. .....%
6. Wt. lost by solution (1 minus 5) . . . . . 7.71 gm. .....%
7. To balance (5 plus 6) . . 0.84 gm. .....%

B. Subsidation:

1. Original Wt. . . . . gm. 100.0%
2. Cylinder (+1/32) gm. .....%
3. Jar (1/32—1/64) gm. .....%
4. Drain . . . . . gm. .....%

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm		
¼–⅛ mm		
⅛–1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform ..... Sp. gr. Size–Grade(s) ..... mm.

Analyst .....

Date .....

Wt. of sample . . . . gm. 100.0%

Heavy Minerals . . . . gm. .....%

Light Minerals . . . . gm. .....%

Shape Analysis:

A .....%: a .....%: C .....%

r .....%: R .....%.

Minerals Identified; Heavy Concentrate	No. of Grains	Rel. %
Total		100%

Classification Grouping: Absol. %

Primary Minerals: .....%

Secondary Minerals: .....%

Light Concentrate

Total 100%

Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W— 0151

Depth 2060 to 2070

No. samples used

Analyst P—

Date 7/20/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight . . . . . 22.00 gm. 100.0% : 2. Wt. of F. P.
3. Wt. after solution, with filter paper . . . . . 5.93 gm.
4. Less wt. F. P. (2) . . . 2.30 gm.
5. Wt. Insol. Residue (3 minus 4) . . . . . 3.63 gm. %
6. Wt. lost by solution (1 minus 5) . . . . . 18.37 gm. %
7. To balance (5 plus 6) . . 22.00 gm. %

B. Subsidation:

1. Original Wt. . . . . gm. 100.0%
2. Cylinder (+1/32) gm. %
3. Jar (1/32—1/64) gm. %
4. Drain . . . . . gm. %

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm		
¼–⅛ mm		
⅛–1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform ..... Sp. gr. Size–Grade(s) ..... mm.

Analyst

Date

Wt. of sample . . . . gm. 100.0%

Heavy Minerals . . . . gm. %

Light Minerals . . . . gm. %

Shape Analysis:

A ..... %: a ..... %: C ..... %

r ..... %: R ..... %.

Minerals Identified; Heavy Concentrate — No. of Grains — Rel. % — Absol. %

Classification Grouping:

Primary Minerals: ..... %

Total 100%

Light Concentrate

Secondary Minerals: ..... %

Total . . . . . 100% Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W— 015 1
Depth 2090 to 2100
No. samples used 1
Analyst P —
Date 7/20/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight . . . . . 22.13 gm. 100.0% : 2. Wt. of F. P. .....
3. Wt. after solution, with filter paper . . . . . 3.78 gm.
4. Less wt. F. P. (2) . . . 2.29 gm.
5. Wt. Insol. Residue (3 minus 4) . . . . . 1.49 gm. ..... %
6. Wt. lost by solution (1 minus 5) . . . . . 18.64 gm. ..... %
7. To balance (5 plus 6) . . .. gm. ..... %

B. Subsidation:

1. Original Wt. . . . . gm. 100.0%
2. Cylinder (+1/32) ..... gm. ..... %
3. Jar (1/32—1/64) ..... gm. ..... %
4. Drain . . . . gm. ..... %

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm		
¼–⅛ mm		
⅛–1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform ..... Sp. gr. Size–Grade(s) ..... mm.

Analyst .....
Date .....

Wt. of sample . . . . gm. 100.0%

Heavy Minerals . . . . gm. ..... %

Light Minerals . . . . gm. ..... %

Shape Analysis:

A ..... %: a ..... %: C ..... %

r ..... %: R ..... %.

Minerals Identified; Heavy Concentrate — No. of Grains — Rel. %

Classification Grouping: — Absol. %
Primary Minerals: ..... %

Total 100%

Light Concentrate

Secondary Minerals: ..... %

Total . . . . . 100% Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W— 0151

Depth 2110 to 2120

No. samples used 1

Analyst P.—

Date 7/20/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight . . . . . 20.52 gm. 100.0%: 2. Wt. of F. P. .....
3. Wt. after solution, with filter paper . . . . . 3.64 gm.
4. Less wt. F. P. (2) . . . 2.34 gm.
5. Wt. Insol. Residue (3 minus 4) . . . . . 1.30 gm. ..... %
6. Wt. lost by solution (1 minus 5) . . . . . 19.22 gm. ..... %
7. To balance (5 plus 6) . . 20.52 gm. ..... %

B. Subsidation:

1. Original Wt. . . . . gm. 100.0%
2. Cylinder (+1/32) ..... gm. ..... %
3. Jar (1/32—1/64) ..... gm. ..... %
4. Drain . . . . gm. ..... %

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm		
¼–⅛ mm		
⅛–1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform ..... Sp. gr. Size–Grade(s) ..... mm.

Analyst .....

Date .....

Wt. of sample . . . . gm. 100.0%

Heavy Minerals . . . . gm. ..... %

Light Minerals . . . . gm. ..... %

Shape Analysis:

A ..... %: a ..... %: C ..... %

r ..... %: R ..... %.

Minerals Identified; Heavy Concentrate — No. of Grains — Rel. % — Absol. %

Classification Grouping:

Primary Minerals: ..... %

Total 100%

Light Concentrate

Secondary Minerals: ..... %

Total . . . . . 100% Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W— 0151

Depth 2130 to 2140

No. samples used

Analyst P.

Date 7/20/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight . . . . . 20.24 gm. 100.0%: 2. Wt. of F. P.
3. Wt. after solution, with filter paper . . . . . 3.76 gm.
4. Less wt. F. P. (2) . . . 2.40 gm.
5. Wt. Insol. Residue (3 minus 4) . . . . . 1.36 gm. %
6. Wt. lost by solution (1 minus 5) . . . . . 18.88 gm. %
7. To balance (5 plus 6) . . 4 gm. %

B. Subsidation:

1. Original Wt. . . . . gm. 100.0%
2. Cylinder (+1/32) gm. %
3. Jar (1/32—1/64) gm. %
4. Drain . . . . . gm. %

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm		
¼–⅛ mm		
⅛–1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform } Sp. gr. Size–Grade(s) mm.

Analyst

Date

Wt. of sample . . . . gm. 100.0%

Heavy Minerals . . . . gm. %

Light Minerals . . . . gm. %

Shape Analysis:

A %: a %: C %

r %: R %.

Minerals Identified: Heavy Concentrate — No. of Grains — Rel. %

Classification Grouping: Absol. %

Primary Minerals: %

Total 100%

Light Concentrate

Secondary Minerals: %

Total . . . . . 100% Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W— 0151

Depth 2170 to 2180

No. samples used .....

Analyst P.—

Date 7/20/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight . . . . . 20.79 gm. 100.0% : 2. Wt. of F. P. .....
3. Wt. after solution, with filter paper . . . . . 3.90 gm.
4. Less wt. F. P. (2) . . . .29 gm.
5. Wt. Insol. Residue (3 minus 4) . . . . . 1.61 gm. ..... %
6. Wt. lost by solution (1 minus 5) . . . . . 19.18 gm. ..... %
7. To balance (5 plus 6) . . 20.79 gm. ..... %

B. Subsidation:

1. Original Wt. . . . . gm. 100.0%
2. Cylinder (+1/32) ..... gm. ..... %
3. Jar (1/32—1/64) ..... gm. ..... %
4. Drain . . . . gm. ..... %

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm		
¼–⅛ mm		
⅛–1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform ..... Sp. gr. Size–Grade(s) ..... mm.

Analyst .....

Date .....

Wt. of sample . . . . gm. 100.0%

Heavy Minerals . . . . gm. ..... %

Light Minerals . . . . gm. ..... %

Shape Analysis:

A ..... %: a ..... %: C ..... %

r ..... %: R ..... %.

Minerals Identified; Heavy Concentrate — No. of Grains — Rel. %

Classification Grouping: — Absol. %

Primary Minerals: ..... %

Total 100%

Light Concentrate

Secondary Minerals: ..... %

Total . . . . . 100% Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W— 0151

Depth 2150 to 2160

No. samples used 1

Analyst P.—

Date 7/20/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight . . . . . 20.26 gm. 100.0% : 2. Wt. of F. P. .....
3. Wt. after solution, with filter paper . . . . . 3.38 gm.
4. Less wt. F. P. (2) . . . 2.45 gm.
5. Wt. Insol. Residue (3 minus 4) . . . . . 93 gm. .....%
6. Wt. lost by solution (1 minus 5) . . . . . 1.33 gm. .....%
7. To balance (5 plus 6) . . 20 gm. .....%

B. Subsidation:

1. Original Wt. . . . . gm. 100.0%
2. Cylinder (+1/32) gm. .....%
3. Jar (1/32—1/64) gm. .....%
4. Drain . . . . . gm. .....%

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm		
¼–⅛ mm		
⅛–1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform ..... Sp. gr. Size–Grade(s) ..... mm.

Analyst .....

Date .....

Wt. of sample . . . . gm. 100.0%

Heavy Minerals . . . . gm. .....%

Light Minerals . . . . gm. .....%

Shape Analysis:

A .....%: a .....%: C .....%

r .....%: R .....%.

Minerals Identified; Heavy Concentrate — No. of Grains — Rel. %

Classification Grouping: Absol. %

Primary Minerals: .....%

Total 100%

Light Concentrate

Secondary Minerals: .....%

Total 100%

Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W— 0151

Depth 2180 to 2190

No. samples used 1

Analyst D—

Date 7/20/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight	20.42 gm.	100.0%	2. Wt. of F. P.
3. Wt. after solution, with filter paper	4.18 gm.		
4. Less wt. F. P. (2)	2.30 gm.		
5. Wt. Insol. Residue (3 minus 4)	1.88 gm.	%	
6. Wt. lost by solution (1 minus 5)	18.54 gm.	%	
7. To balance (5 plus 6)	20.42 gm.	%	

B. Subsidation:

1. Original Wt.	gm.	100.0%
2. Cylinder (+1/32)	gm.	%
3. Jar (1/32—1/64)	gm.	%
4. Drain	gm.	%

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm		
¼–⅛ mm		
⅛–1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform ..... Sp. gr. Size–Grade(s) ..... mm.

Analyst .....

Date .....

Wt. of sample . . . . gm. 100.0%

Heavy Minerals . . . . gm. %

Light Minerals . . . . gm. %

Shape Analysis:

A ..... %: a ..... %: C ..... %

r ..... %: R ..... %.

Minerals Identified: Heavy Concentrate	No. of Grains	Rel. %
Total		100%
Light Concentrate		
Total		100%

Classification Grouping: Absol. %

Primary Minerals: ..... %

Secondary Minerals: ..... %

Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W— 0151

Depth 2190 to 2200

No. samples used 1

Analyst P.—

Date 7/20/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight . . . . . 20.51 gm. 100.0% : 2. Wt. of F. P. .....
3. Wt. after solution, with filter paper . . . . . 11.87 gm.
4. Less wt. F. P. (2) . . . 2.31 gm.
5. Wt. Insol. Residue (3 minus 4) . . . . . 9.56 gm. ..... %
6. Wt. lost by solution (1 minus 5) . . . . . 10.75 gm. ..... %
7. To balance (5 plus 6) . . 20.5 gm. ..... %

B. Subsidation:

1. Original Wt. . . . . gm. 100.0%
2. Cylinder (+1/32) ..... gm. ..... %
3. Jar (1/32—1/64) ..... gm. ..... %
4. Drain . . . . gm. ..... %

C. Screen Analysis 9.54

SIZE	GRAMS	%
~~2 plus~~		
~~2–1 mm~~		
1–½ mm	.03	
½–¼ mm	4.52	
¼–⅛ mm	4.11	
⅛–1/16	.52	
Pan	.42	
Total	9.60	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform ..... Sp. gr. Size–Grade(s) ..... mm.

Analyst .....

Date .....

Wt. of sample . . . . gm. 100.0%

Heavy Minerals . . . . gm. ..... %

Light Minerals . . . . gm. ..... %

Shape Analysis:

A ..... %: a ..... %: C ..... %

r ..... %: R ..... %.

Minerals Identified; Heavy Concentrate — No. of Grains — Rel. % — Absol. %

Classification Grouping:

Primary Minerals: ..... %

Total 100%

Light Concentrate

Secondary Minerals: ..... %

Total . . . . . 100% Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W-- 0151

Depth 2210 to 2220

No. samples used 1

Analyst P.

Date 7/20/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight . . . . . 20.53 gm. 100.0% : 2. Wt. of F. P. .....
3. Wt. after solution, with filter paper . . . . . 19.22 gm.
4. Less wt. F. P. (2) . . . 2.44 gm.
5. Wt. Insol. Residue (3 minus 4) . . . . . 16.78 gm. .....%
6. Wt. lost by solution (1 minus 5) . . . . . 3.75 gm. .....%
7. To balance (5 plus 6) . . 20.53 gm. .....%

B. Subsidation:

1. Original Wt. . . . . gm. 100.0%
2. Cylinder (+1/32) . . . . . gm. .....%
3. Jar (1/32—1/64) . . . . . gm. .....%
4. Drain . . . . . gm. .....%

C. Screen Analysis 16.78

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm	2.95	
½–¼ mm	7.21	
¼–⅛ mm	4.75	
⅛–1/16	.96	
Pan	15	
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform ..... Sp. gr. Size–Grade(s) ..... mm.

Analyst .....

Date .....

Wt. of sample . . . . gm. 100.0%

Heavy Minerals . . . . gm. .....%

Light Minerals . . . . gm. .....%

Shape Analysis:

A .....%: a .....%: C .....%

r .....%: R .....%.

Minerals Identified; Heavy Concentrate	No. of Grains	Rel. %
Total		100%
Light Concentrate		
Total		100%

Classification Grouping: Absol. %

Primary Minerals: .....%

Secondary Minerals: .....%

Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W— 0151

Depth 2230 to 2240

No. samples used 1

Analyst PnI

Date 8/8/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight . . . . . 20.14 gm. 100.0% : 2. Wt. of F. P. .....
3. Wt. after solution, with filter paper . . . . . 21.43 gm.
4. Less wt. F. P. (2) . . . 2.30 gm.
5. Wt. Insol. Residue (3 minus 4) . . . . . 18.83 gm. ..... %
6. Wt. lost by solution (1 minus 5) . . . . . 1.31 gm. ..... %
7. To balance (5 plus 6) . . 20.14 gm. ..... %

B. Subsidation:

1. Original Wt. . . . . gm. 100.0%
2. Cylinder (+1/32) ..... gm. ..... %
3. Jar (1/32—1/64) ..... gm. ..... %
4. Drain . . . . gm. ..... %

C. Screen Analysis 18.83

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm	.14	
½–¼ mm	9.56	
¼–⅛ mm	6.60	
⅛–1/16	1.30	
Pan	1.17	
Total	18.77	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform ..... Sp. gr. Size–Grade(s) ..... mm.

Analyst .....

Date .....

Wt. of sample . . . . gm. 100.0%

Heavy Minerals . . . . gm. ..... %

Light Minerals . . . . gm. ..... %

Shape Analysis:

A ..... %: a ..... %: C ..... %

r ..... %: R ..... %.

Minerals Identified; Heavy Concentrate — No. of Grains — Rel. % — Absol. %

Classification Grouping:

Primary Minerals: ..... %

Total 100%

Light Concentrate

Secondary Minerals: ..... %

Total . . . . . 100% Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W— 0151

Depth 2250 to 2260

No. samples used .....

Analyst P.n.l

Date 8/8/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight . . . . . 20.15 gm. 100.0% : 2. Wt. of F. P. .....
3. Wt. after solution, with filter paper . . . . . 7.02 gm.
4. Less wt. F. P. (2) . . . 2.31 gm.
5. Wt. Insol. Residue (3 minus 4) . . . . . 4.71 gm. ..... %
6. Wt. lost by solution (1 minus 5) . . . . . 15.44 gm. ..... %
7. To balance (5 plus 6) . . 20.15 gm. ..... %

B. Subsidation:

1. Original Wt. . . . . 4.71 gm. 100.0%
2. Cylinder (+1/32) 5.90 2.34 2.56 gm. ..... %
3. Jar (1/32—1/64) 2.41 .24 gm. ..... %
4. Drain . . . . . 1.96 gm. ..... %

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm		
¼–⅛ mm		
⅛–1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform ..... Sp. gr. Size–Grade(s) ..... mm.

Analyst .....

Date .....

Wt. of sample . . . . . gm. 100.0%

Heavy Minerals . . . . . gm. ..... %

Light Minerals . . . . . gm. ..... %

Shape Analysis:

A ..... %: a ..... %: C ..... %

r ..... %: R ..... %.

Minerals Identified; Heavy Concentrate	No. of Grains	Rel. %
Total		100%

Classification Grouping: Absol. %

Primary Minerals: ..... %

Secondary Minerals: ..... %

Light Concentrate

Total . . . . . 100% Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W— 0151

Depth 2280 to 2290

No. samples used

Analyst Paul

Date 8/18/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight . . . . . 20.22 gm. 100.0% : 2. Wt. of F. P.
3. Wt. after solution, with filter paper . . . . . 5.95 gm.
4. Less wt. F. P. (2) . . . 2.32 gm.
5. Wt. Insol. Residue (3 minus 4) . . . . . 3.63 gm. %
6. Wt. lost by solution (1 minus 5) . . . . . 16.59 gm. %
7. To balance (5 plus 6) . . . .02 gm. %

B. Subsidation:

1. Original Wt. . . . . gm. 100.0%
2. Cylinder (+1/32) gm. %
3. Jar (1/32—1/64) gm. %
4. Drain . . . . . gm. %

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm		
¼–⅛ mm		
⅛–1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform ..... Sp. gr. Size–Grade(s) ..... mm.

Analyst

Date

Wt. of sample . . . . gm. 100.0%

Heavy Minerals . . . . gm. %

Light Minerals . . . . gm. %

Shape Analysis:

A ..... %: a ..... %: C ..... %

r ..... %: R ..... %.

Minerals Identified; Heavy Concentrate — No. of Grains — Rel. %

Classification Grouping: — Absol. %

Primary Minerals: ..... %

Total 100%

Light Concentrate

Secondary Minerals: ..... %

Total . . . . . 100% Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W— 0151

Depth 2310 to 2320

No. samples used .....

Analyst PDL

Date 8/8/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight	20.17 gm.	100.0% : 2. Wt. of F. P.	
3. Wt. after solution, with filter paper	2.59 gm.		
4. Less wt. F. P. (2)	2.34 gm.		
5. Wt. Insol. Residue (3 minus 4)	5.25 gm.	%	
6. Wt. lost by solution (1 minus 5)	14.92 gm.	%	
7. To balance (5 plus 6)	20.17 gm.	%	

B. Subsidation:

1. Original Wt.	5.25 gm.	100.0%	
2. Cylinder (+1/32) Carbide 2.38 2.50	4.28 gm.	%	
3. Jar (1/32—1/64)	gm.	%	
4. Drain	74 gm.	%	

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm		
¼–⅛ mm		
⅛–1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform ..... Sp. gr. Size–Grade(s) ..... mm.

Analyst .....

Date .....

Wt. of sample ..... gm. 100.0%

Heavy Minerals ..... gm. ..... %

Light Minerals ..... gm. ..... %

Shape Analysis:

A ..... %: a ..... %: C ..... %

r ..... %: R ..... %.

Minerals Identified; Heavy Concentrate	No. of Grains	Rel. %
Total		100%
Light Concentrate		
Total		100%

Classification Grouping: Absol. %

Primary Minerals: ..... %

Secondary Minerals: ..... %

Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W— 151

Depth 2330 to 2340

No. samples used 1

Analyst PnI

Date 8/8/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight . . . . . 20.17 gm. 100.0% : 2. Wt. of F. P. .....
3. Wt. after solution, with filter paper . . . . . 5.45 gm.
4. Less wt. F. P. (2) . . . 2.41 gm.
5. Wt. Insol. Residue (3 minus 4) . . . . . 3.04 gm. ..... %
6. Wt. lost by solution (1 minus 5) . . . . . 17.13 gm. ..... %
7. To balance (5 plus 6) . . 20.17 gm. ..... %

B. Subsidation:

1. Original Wt. . . . . gm. 100.0%
2. Cylinder (+1/32) ..... gm. ..... %
3. Jar (1/32—1/64) ..... gm. ..... %
4. Drain . . . . gm. ..... %

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm		
¼–⅛ mm		
⅛–1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform ..... Sp. gr. Size–Grade(s) ..... mm.

Analyst .....

Date .....

Wt. of sample . . . . gm. 100.0%

Heavy Minerals . . . . gm. ..... %

Light Minerals . . . . gm. ..... %

Shape Analysis:

A..... %: a..... %: C..... %

r ..... %: R ..... %.

Minerals Identified; Heavy Concentrate	No. of Grains	Rel. %
Total		100%

Classification Grouping: Absol. %

Primary Minerals: ..... %

Secondary Minerals: ..... %

Light Concentrate

Total . . . . . 100% Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W— 0151

Depth 2350 to 2360

No. samples used 1

Analyst KD

Date 4/18/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight . . . . . 20.29 gm. 100.0% : 2. Wt. of F. P.
3. Wt. after solution, with filter paper . . . . . 6.72 gm.
4. Less wt. F. P. (2) . . . 2.32 gm.
5. Wt. Insol. Residue (3 minus 4) . . . . . 4.40 gm. %
6. Wt. lost by solution (1 minus 5) . . . . . 15.89 gm. %
7. To balance (5 plus 6) . . 20.29 gm. %

B. Subsidation:

1. Original Wt. . . . . 4.40 gm. 100.0%
2. Cylinder (+1/32) 5.65 2.40 3.25 gm. %
3. Jar (1/32—1/64) 2.68 2.41 .27 gm. %
4. Drain . . . . . .88 gm. %

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm		
¼–⅛ mm		
⅛–1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform } ..... Sp. gr. Size–Grade(s) ..... mm.

Analyst .....

Date .....

Wt. of sample . . . . gm. 100.0%

Heavy Minerals . . . . gm. ..... %

Light Minerals . . . . gm. ..... %

Shape Analysis:

A ..... %: a ..... %: C ..... %

r ..... %: R ..... %.

Minerals Identified; Heavy Concentrate	No. of Grains	Rel. %
Total		100%

Classification Grouping: Absol. %

Primary Minerals: ..... %

Light Concentrate

Secondary Minerals: ..... %

Total	100%	Total	100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W— 0151

Depth 2380 to 2390

No. samples used 1

Analyst PnJ

Date 8/8/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight	20.48 gm.	100.0% :	2. Wt. of F. P.
3. Wt. after solution, with filter paper	5.66 gm.		
4. Less wt. F. P. (2)	2.31 gm.		
5. Wt. Insol. Residue (3 minus 4)	3.35 gm.	%	
6. Wt. lost by solution (1 minus 5)	17.13 gm.	%	
7. To balance (5 plus 6)	0.48 gm.	%	

B. Subsidation:

1. Original Wt.	3.35 gm.	100.0%	
2. Cylinder (+1/32) 4.77	.2 gm.	%	
3. Jar (1/32—1/64) 2.46 2.29	.17 gm.	%	
4. Drain	.50 gm.	%	

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm		
¼–⅛ mm		
⅛–1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform ..... Sp. gr. Size–Grade(s) ..... mm.

Analyst .....

Date .....

Wt. of sample . . . . gm. 100.0%

Heavy Minerals . . . . gm. %

Light Minerals . . . . gm. %

Shape Analysis:

A ..... % : a ..... % : C ..... %

r ..... % : R ..... %.

Minerals Identified; Heavy Concentrate	No. of Grains	Rel. %
Total		100%
Light Concentrate		
Total		100%

Classification Grouping: Absol. %

Primary Minerals: ..... %

Secondary Minerals: ..... %

Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

MECHANICAL ANALYSIS

Well No. W— 0151
Depth 2390 to 2400
No. samples used 1
Analyst D.
Date 8/8/35

A. Acid treatment (HCl 15 %)

1. Sample weight . . . . . 20.5 gm. 100.0% : 2. Wt. of F. P. ....
3. Wt. after solution, with filter paper . . . . 8.92 gm.
4. Less wt. F. P. (2) . . . . 2.44 gm.
5. Wt. Insol. Residue (3 minus 4) . . . . 6.48 gm. ....%
6. Wt. lost by solution (1 minus 5) . . . . 14.03 gm. ....%
7. To balance (5 plus 6) . . 20.51 gm. ....%

B. Subsidation:

1. Original Wt. . . . . . . 6.48 gm. 100.0%
2. Cylinder (+1/32) 7.28 / 2.41 / 2.24 4.87 gm. ....%
3. Jar (1/32—1/64) 2.34 0 gm. ....%
4. Drain . . . . 1.21 gm. ....%

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm		
¼–⅛ mm		
⅛–1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Analyst ....
Date ....

Acet. Tetrabr. / Bromoform / .... } ....Sp. gr. Size–Grade(s) ....mm.

Wt. of sample . . . .gm. 100.0%

Heavy Minerals . . . .gm. ....%

Light Minerals . . . .gm. ....%

Shape Analysis:

A ....% : a ....% : C ....%

r ....% : R ....%.

Minerals Identified; Heavy Concentrate — No. of Grains — Rel. %

Total 100%

Light Concentrate

Total 100%

Classification Grouping: — Absol. %

Primary Minerals: ....%

Secondary Minerals: ....%

Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

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DEEP WELL STUDY

Well No. W— 0151

Depth 2410 to 2420

No. samples used 1

Analyst PAL

Date 8/8/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight . . . . . 20.31 gm. 100.0% : 2. Wt. of F. P. .....
3. Wt. after solution, with filter paper . . . . . 4.47 gm.
4. Less wt. F. P. (2) . . . 2.30 gm.
5. Wt. Insol. Residue (3 minus 4) . . . . . 2.17 gm. .....%
6. Wt. lost by solution (1 minus 5) . . . . . 18.14 gm. .....%
7. To balance (5 plus 6) . . 0.3 gm. .....%

B. Subsidation:

1. Original Wt. . . . . gm. 100.0%
2. Cylinder (+1/32) . . . . . gm. .....%
3. Jar (1/32—1/64) . . . . . gm. .....%
4. Drain . . . . . gm. .....%

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm		
¼–⅛ mm		
⅛–1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform ..... Sp. gr. Size–Grade(s) ..... mm.

Analyst .....

Date .....

Wt. of sample . . . . gm. 100.0%

Heavy Minerals . . . . gm. .....%

Light Minerals . . . . gm. .....%

Shape Analysis:

A .....%: a .....%: C .....%

r .....%: R .....%.

Minerals Identified: Heavy Concentrate	No. of Grains	Rel. %
Total		100%
Light Concentrate		
Total		100%

Classification Grouping: Absol. %

Primary Minerals: .....%

Secondary Minerals: .....%

Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W— 015
Depth 2460 to 2470
No. samples used 1
Analyst PM
Date 8/8/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight . . . . . 20.37 gm. 100.0% : 2. Wt. of F. P. .....
3. Wt. after solution, with filter paper . . . . . 12.42 gm.
4. Less wt. F. P. (2) . . . 2.42 gm.
5. Wt. Insol. Residue (3 minus 4) . . . . . 0.00 gm. .....%
6. Wt. lost by solution (1 minus 5) . . . . . 10.37 gm. .....%
7. To balance (5 plus 6) . . 20.37 gm. .....%

B. Subsidation:

1. Original Wt. . . . . 10.00 gm. 100.0%
2. Cylinder (+1/32) 7.35 2.36 4.99 gm. .....%
3. Jar (1/32—1/64) 3.47 3.63 .76 gm. .....%
4. Drain . . . . . 4.15 gm. .....%

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm		
¼–⅛ mm		
⅛–1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform ..... Sp. gr. Size–Grade(s) ..... mm.

Analyst .....
Date .....

Wt. of sample . . . . . gm. 100.0%

Heavy Minerals . . . . . gm. .....%

Light Minerals . . . . . gm. .....%

Shape Analysis:

A .....%: a .....%: C .....%

r .....%: R .....%.

Minerals Identified; Heavy Concentrate — No. of Grains — Rel. % — Absol. %

Classification Grouping:
Primary Minerals: .....%

Total 100%

Light Concentrate

Secondary Minerals: .....%

Total . . . . . 100% Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

Well No. W— 0151

Depth 2480 to 2488

No. samples used 1

Analyst PM

Date 8/18/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight . . . . . 20.62 gm. 100.0% : 2. Wt. of F. P. .....
3. Wt. after solution, with filter paper . . . . . 9.02 gm.
4. Less wt. F. P. (2) . . . 2.4 gm.
5. Wt. Insol. Residue (3 minus 4) . . . . . 6.61 gm. ..... %
6. Wt. lost by solution (1 minus 5) . . . . . 14.01 gm. ..... %
7. To balance (5 plus 6) . . 20.62 gm. ..... %

B. Subsidation:

1. Original Wt. . . . . gm. 100.0%
2. Cylinder (+1/32) ..... gm. ..... %
3. Jar (1/32—1/64) ..... gm. ..... %
4. Drain . . . . gm. ..... %

C. Screen Analysis 6.47

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm	.73	
¼–⅛ mm	.69	
⅛–1/16	1.21	
Pan	3.47	
Total	6.30	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform ..... Sp. gr. Size–Grade(s) ..... mm.

Analyst .....

Date .....

Wt. of sample . . . . gm. 100.0%

Heavy Minerals . . . . gm. ..... %

Light Minerals . . . . gm. ..... %

Shape Analysis:

A ..... %: a ..... %: C ..... %

r ..... %: R ..... %.

Minerals Identified; Heavy Concentrate — No. of Grains — Rel. % — Absol. %

Classification Grouping:

Primary Minerals: ..... %

Total 100%

Light Concentrate

Secondary Minerals: ..... %

Total . . . . . 100% Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

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DEEP WELL STUDY

Well No. W— 0151

Depth 2495 to 2500

No. samples used 1

Analyst Pn 1

Date 8/2/35

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight . . . . . 20.38 gm. 100.0%: 2. Wt. of F. P. .....
3. Wt. after solution, with filter paper . . . . . 10.62 gm.
4. Less wt. F. P. (2) . . . 2.33 gm.
5. Wt. Insol. Residue (3 minus 4) . . . . . 8.29 gm. .....%
6. Wt. lost by solution (1 minus 5) . . . . . 12.09 gm. .....%
7. To balance (5 plus 6) . . 20.38 gm. .....%

B. Subsidation:

1. Original Wt. . . . . 8.29 gm. 100.0%
2. Cylinder (+1/32) 9.18 − 2.38 = 6.80 gm. .....%
3. Jar (1/32—1/64) 2.77 − 2.34 = .43 gm. .....%
4. Drain . . . . . 1.06 gm. .....%

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2–1 mm		
1–½ mm		
½–¼ mm		
¼–⅛ mm		
⅛–1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. / Bromoform ..... Sp. gr. ..... Size–Grade(s) ..... mm.

Analyst .....

Date .....

Wt. of sample . . . . gm. 100.0%

Heavy Minerals . . . . gm. ..... %

Light Minerals . . . . gm. ..... %

Shape Analysis:

A ..... %: a ..... %: C ..... %

r ..... %: R ..... %.

Minerals Identified; Heavy Concentrate	No. of Grains	Rel. %
Total		100%

Classification Grouping: Absol. %

Primary Minerals: .....%

Secondary Minerals: .....%

Light Concentrate

Total 100%

Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).

Sample drillings from Grinnell Well No. 6.

1990-2000. Dolomite, white, in fine crystalline grains. Nearly entirely soluble in hot acid.

2000-2010. Dolomite, light gray, in coarse and fine crystalline fragments and grains. Rapidly and almost completely soluble in hot acid.

2010-2020. Dolomite, nearly white, in fine grystalline granules. Almost entirely soluble in hot acid but with a few insoluble grains.

2020-2030. Dolomite, light gray, in coarse crystalline grains and fragments, some 1/8 to 1/4 inch in diameter. Nearly all soluble in hot acid.

2030-2040. Dolomite, light gray, in small grains with much white chert, probably over one-half.

2040-2050 Dolomite, light gray, in small grains, with a large amount of white chert.
Drillings washed away here.

2060-2070. Dolomite, medium gray, fine-grained, subcrystalline. Considerable chert, some clear grains.

2070-2080. Dolomite, dark gray, in fine grains with considerable white chert in angular chips and smaller grains. Some clear sand grains and a little pyrite.

2080-2090. Dolomite, gray, in very fine grains with very little chert. Fairly ready response to cold acid and much increased on heating.

2090-2100. Dolomite, similar to preceding but with a good deal of chert in small white angular grains.
Drillings washed away here.

2110-2120. Dolomite, similar to above but with slow response in cold acid.

2120-2130. Dolomite, gray, in very fine subcrystalline grains with some clear sparkling rounded grains of quartz.
A very small residue in hot acid.

2130-2140. Dolomite, gray, similar to preceding.

2140-2150. Dolomite, gray, similar to preceding.

2150-2160. Dolomite, gray, similar to sample above.

2160-2170. Dolomite, in very fine light gray powder, almost flourlike.
A very small residue of very fine grains after treatment with hot acid.

2170-2180. Dolomite, dark gray, in fine subcrystalline grains. Nearly all soluble in hot acid.

Grinnell Well No. 6

2180-2190. Dolomite, in fine gray powder, light gray when dry, with some sand in very small grains. Slow response to cold acid.

2190-2200. Sand grains, very small, clear, with dolomite in fine white powder. May be called a sandy dolomite.

2200-2210. Sandstone, sand grains with dolomitic matrix, very little reaction with cold acid, more with hot acid, but not long continued. A large residue of clear well rounded grains.

2210-2220. Sandstone, in very fine grains; a little reaction in hot acid, perhaps from material fallen from above.

2180-2190. Dolomite,in fine gray powder,light gray when dry,with some sand in very small grains. Slow response to cold acid.

2190-2200. Sand grains, very small,clear,with dolomite in fine white powder. May be called a sandy dolomite.

2200-2210. Sandstone,sand grains with gray crystalline dolomitic matrix, very little reaction with cold acid,more with hot acid,but n not long continued. A large residue of clear well rounded grains.

2210-2220. Sandstone, in very fine rounded clean grains; a little dolomitic matrix, white to light gray,between the grains.

2220-2230. Sandstone similar to above but matrix light cream colored and sand grains a little coarser. Not much reaction with hot acid.

2230-2240. Sandstone,similar to above but with fine grains.

2240-2248 Sandstone,nearly white,in very fine grains. Almost entirely insoluble in hot acid.

2248-2250. Dolomite,dark gray,subcrystalline,much sand in fine clear round grains.

2250-2254. Dolomite,dark gray,fine-textured. Brisk response to hot acid but with large residue of sand grains and some dark specks which probably are shaly. (Sample brought in Aug.15,1926)

2250-2260 Dolomite,finely sugary texture, rather dark gray,some sand grains visible . (Sample brought in Sept. 20,1926)

2257-2261 Dolomite,similar to above,finely granular or sugary texture (Sample brought in Aug.15,1926)

2260-2270 Dolomite, darker gray than 2250-2260,much sand in fine clear rounded grains (Sample brought in Sept.20,1926)

2280-2290 Dolomite, rather dark gray,fine sugary texture,not much sand visible, but with considerable residue of very fine sandy material (Sample brought in Sept.20,1926)

2261-2263 Dolomite,gray,similar to above, much fine sand (Sample brought in Aug. 15.1926)

2290-2300 Dolomite, light gray, in fine powder, with only a small insoluble residue of very fine material. (Sample brought in Sept.20,1926)

2310-2320 Dolomite ,dark gray,in chips and grains, same sugary texture as in several other samples; some fine-grained residue. (Sample brought in Sept.20,1926)

2330-2340 Dolomite,light gray,in very fine powder,similar to sample at 2290-2300 , but with more finely siliceous and clayey residue (Sample brought in Sept. 20,1926)

2350-2360 Dolomite,gray, in small chips and grains,sugary texture; almost no response to cold acid,fairly vigorous and long continued action with hot acid. Rather large amount of very fine sandy residue. (Sample brought in Nov.1,1926)

2360-2370 Dolomite,similar to above .(Sample brought in Nov.1,1926)

2370-2380 Dolomite,lighter gray than above,in fine sugary grains, fine sandy residue. (Sample brought in Nov. 1,1926)

2380-2390. Dolomite, similar to above;with some chips of crystalline structure(Sample brought in Nov.1,1926)

2390-2400 Dolomite,in blue-gray,finely gritty powder;fine sandy and clayey residue.(Sample brought in Nov.1,1926)

2400-2410 Dolomite,like sample at 2380-2390.(Sample brought in Nov.1,1926)

2410-2420 Dolomite ,like sample above. (Sample brought in Nov.1,1926)

2420-2430 Dolomite,in brownish gray fine sand to small chips,crystalline; strong response to acid;large residue,as in other samples. (Samples brought in Nov.1,1926)

2430-2440 Dolomite,gray,in coarse grains and chips; large amount of sandy residue. (Sample brpught in Nov.1,1926)

2460-2470 Dolomite,gray,rather fine grains, much finely,sandy and clayey residue. About four feet of shale below 2465 feet.
(Sample brought in Nov.1,1926.

Drill working in Franconia

Jordan found at 2248

Heavy dolomite in Trempealeau

Cannot say not having looked thru the samples where Franconia begins

Franconia may run 100 feet or more deeper. Will be dry.

Little hope from Dresbach or ~~Eau~~ Mt Simon. Dresbach may be weathered & shale, close textured beds continue several hundred feet. At Boone well beginning set struck at 2846, 950 below St Peter. Corresponds ~~b 2 &~~ 2680 at Grinnell, But porosity for a short and strata may run differently in composition & structure.

A chance of getting water at base of Franconian below but hardly probable. Still less probable that water if found would not be highly mineralized.

Nov. 3. to Chas Cratty Grinnell

Rowse / City well No 6 Curb 1014'

Name of Well Grinnell W 015 / Sheet No. 1

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

200 (Miss 200-210) A I.

210-220 Missing

220

Limestone, hard, dense, lgt. grey to Cream, 70-80%; sand, angu. to ang. in part from drift, 10-20%; Pebbles from drift, Qtzite, granite etc. 1-10%:

Shaley Limestone 60-70%; buff to yellow in color, some fragments of grey LS; as in 200-210; Sand, well rounded, 15%; also ang. Qtz, feldspar, Mica, am. & Pyrox. from pieces of drift, Chert, ±20%; grn; dense

230

Note: sample from 10-20 Missing, Column Moved up 1 space

Limestone, White and brown Mixed; brown is dolomitic; both contain fossil frag. Also contains Pebbles & sand from drift (about 2%) of sample) Chert ±4% as 220-230

240

Shale, 60-70%, grey, very calcareous; Qtz in well rounded grains, 5-15%; Limestone fragments 5-15%; also some 2-5% of drift, Chert, ±10%

250

Missing

260

Shaley Limestone; grey, (85-95%) 68%

Chert, white, dense, (5-15%) 20% correction; Qtz, 1-2%.

Qtz is in form of sand & angular pieces, latter probably from drift in part, also, feldspar, ferro mag. Mica etc from drift 10-20%.

270

Missing

280

Limestone, grey, slightly shaley, 70-80%

Qtz, in minute fragments, 1-5%; about 10% rounded sand grains; Chert, white, dense, 10-15%; Feldspar, a trace (Study accessory minerals after washing) Some white drift.

290

Limestone, slightly shaley, 70-80%;

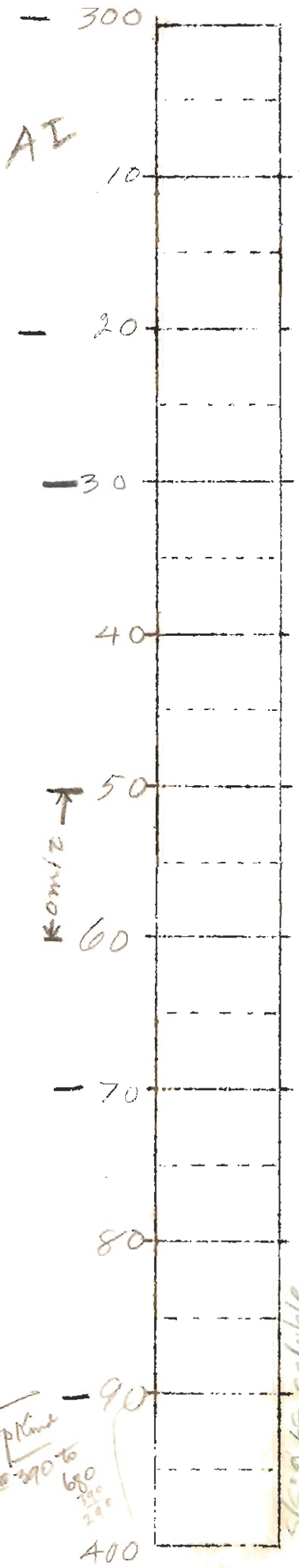
Chert, white, dense, 10-15%; Qtz 1-5%; Qtz in broken frag. & sand grains; treatment with acid shows considerable number of minerals & rock fragments from drift.

300

Log Note above

Name of Well Grinnell, Walsh Sheet No. 2

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



Limestone; 80-85%; Light grey; slightly Shaley; Qtz, in fresh, angular fragment, 1 or 2%; Pyrite, <1%; a few fossil frag. Chert white dense, 1 or 2%-

Limestone, white to cream, hard, 80-90%; Qtz, fresh, angular pieces, 5-15%; green mineral, may be glauconite or greenalite, <1%; Feldspar, Mica, a trace. Some Pyrite; (Examine for acc. minerals after washing) a few frag. of fossils

Missing

Limestone, grey to cream, 70-80%; Qtz, in fresh, angular pieces, 5-15%. Chert white, dense 1-5%; Green mineral resembling glauconite, <1%; Pyrite <1%; Fossil fragments abundant.

Limestone, white to grey, 80-90%; Qtz, fresh, clear Xls, 1-10%; sample so ground that few minerals can be distinguished before washing.

Limestone, white, 80-90%; Material nearly Powdered, so very little can be seen before washing; Qtz, in angular pieces, 1-10%; Pyrite <1%

Missing

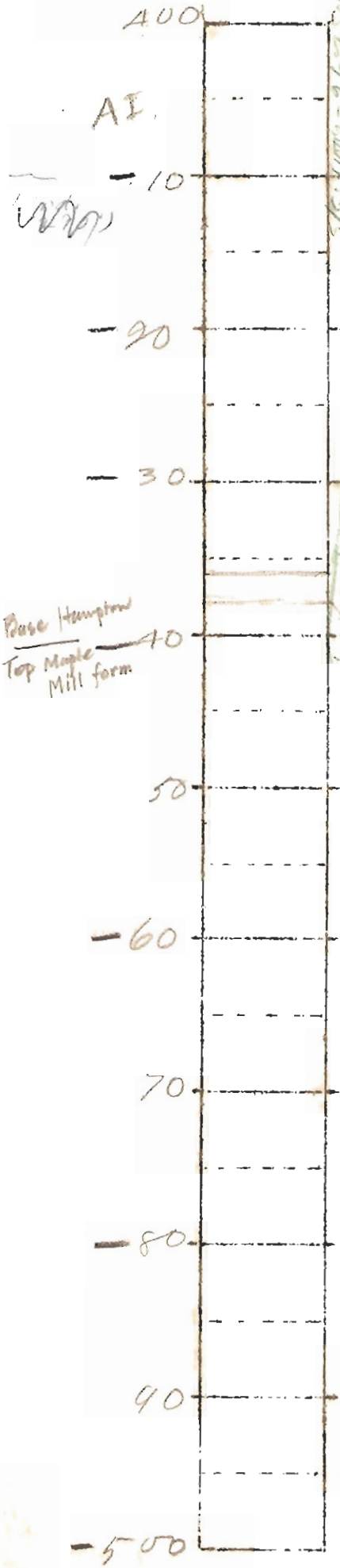
Limestone, Light grey, 85-95%- ground very fine, Powdered by drill, will require washing before much can be seen. Chert, 5-15%

Limestone, grey to white, pure, 80-90% sample ground very fine, covering most of minerals with powdery Qtz angular, 1-10%; Pyrite, <1%; chert 5-10%.

Limestone, grey, 85-95%, finely ground up by the drill; Pyrite 1% ± Qtz, 1-10%; black mineral <1% ±1% (silt size)

Name of Well Grinnell Wolst Sheet No. 3

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



Limestone, white to grey, Shaley 60-70%; Qtz, in very minute particals, 20-30%; Pyrite 1% + green mineral, resam bling Glauconite, <1%

Shale, very calcareous; white to grey, calcite, in very minute xls, probably 30-40%, dolomite, aggregates, 1 to 5%.

No Sample

57% Soluble

Shale, very calcareous, light grey in color, 80-90%; dolomite in pink to brown angular masses, 5-15%; Sand well rounded ⅛-½ or 2%; Pyrite <1% (Dolomite Probably interbedded with Sh.)

Shale, very calcareous, light grey in color, 80-90% (Probably shale is 50% CaCO3)

Dolomite, in brn or pink masses, 10-20%; Qtz, angular frag. & Sand 1-5%; Chert <1%

Shale, very calcareous, dark grey in color, 50-60%; Dolomite, Pink to brown [in masses which are not 100% dolomite, but contain 10 or 20% Qtz] 40-50%, Qtz, angular and some rounded sand 1-10%. Pyrite <1%

Shale, slightly calcareous, dark grey, 50-60%

Dolomite, Pink impure, 40-50%, Probably interbedded with Shale, Pyrite 1%±, Qtz, angular, (distinguishable size) 1-5%.

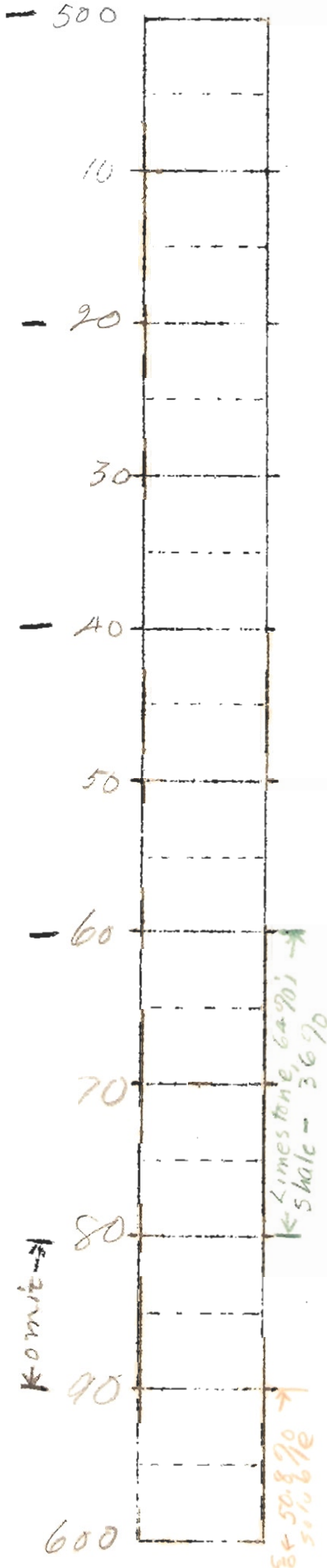
Shale, dark grey, slightly calcareous, dense, 80-90%; dolomite, similar to that found in above samples, 5-15%; Pyrite <1%; Qtz, sand 1%± Parts of sample are iron stained.

Shale, dark grey, slightly calcareous, 85-95%; dolomite pink to brown, impure, 5-10%; Pyrite, <1%; Qtz, sand grains, 1 or 2%; (does not include very fine Qtz. in shale)

Shale, dark grey, hard when dry, does not soak up readily, 90-98%; dolomite, Pink, impure, 1-5%; Pyrite, a trace. Sand, <1%.

Name of Well Gunnell/Wolfe Sheet No. A

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



Shale, very dark grey and light blue-grey interbedded, 90-98%; non calcareous, except where dolomite is found. Dolomite, <1%; Pyrite ± 1%.

Shale, dark grey; non calcareous; 70-80%; blocky, micaceous, hard fragments containing same with chert & minute Qtz xls, 10-20%; Pyrite ± 1%. Sand, <1%

Shale, light grey, very fine grained, smooth, greasy feel, 95-99%; Pyrite, <1%.

Shale, light grey, calcareous; very fine-grained, (no gritty feel between ~~ones teeth~~) - regularly 100%; a very few rounded sand grains, may be from above.

Shale, light grey, calcareous, very fine grained, - 95-99%; Material so fine, no minerals observed but Qtz in minute par. & a very small amt. of Pyrite.

Shale, light grey, calcareous, 60-70%; Limestone, in grey to brown fragments, 10-20%; Sand, fine, 1-5%; Pyrite, ± 1%. a few fragments of a very green shale

Shale, light grey, very, — calcareous, 80-90%; limestone, 5-15%; Sand, angular ± - 1/4, 1-5%; Pyrite, ± 1%, chert, <1%

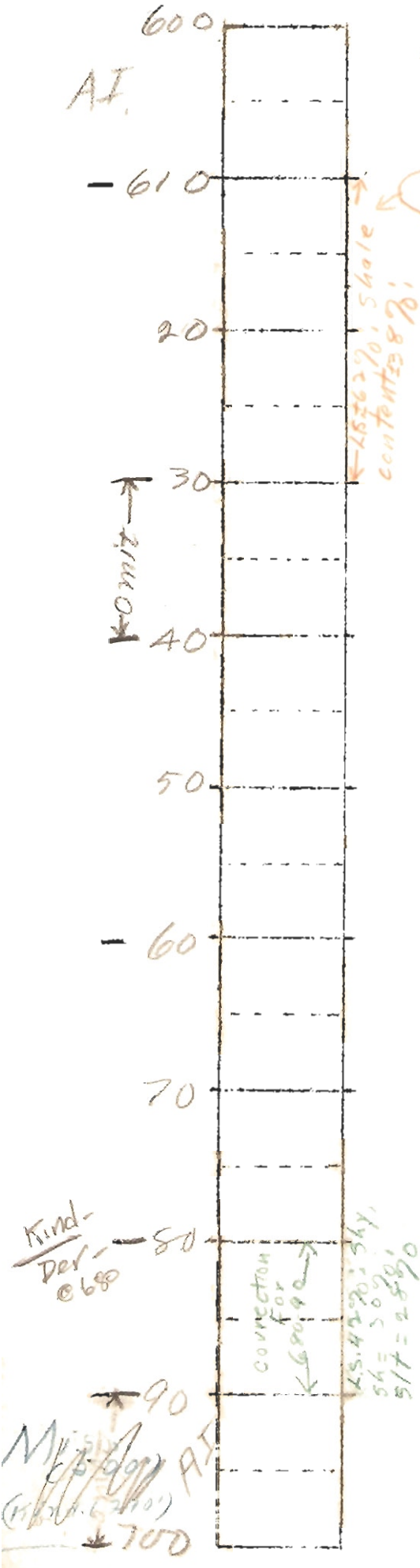
Shale, light grey, very calcareous, 80-90%; Limestone, minute pieces, 1-10%; Pyrite ± 1%; Qtz, 1-5%.

Shale grey, calcareous; 70-80% limestone, in minute particle, 10-20% Qtz, 1-5%; Pyrite ± 1%.

Shale, grey, calcareous, 80-90% Lime Stone 5-10%; Qtz, in angular fragments, 1-5%; Pyrite <1%.

Name of Well Grunnell, Wm #1 Sheet No. 5

Depth Range _____ Scale: 1 inch=10 feet.



Shale, light grey, very calcareous, 80-90%; Limestone, in small pieces, 1-10%; Qtz, angular, clear, 1-3%; Pyrite <1%

Shale, light grey, calcareous, 60-70%
Limestone, light grey in small fragments, 20-30%; Qtz, in angular grains, 5-10%; Pyrite <1%.

Shale, light grey, calcareous, 70-80%
Limestone, 15-25%. Pyrite, 1%; Qtz, rounded sand grains, 1 to 5%
Some iron stain.

Shale, grey, very calcareous, 85-95%
Calcite, small fragments, 1-10%; Pyrite ± 1%; Qtz, sand, <1%

Shale, light grey, fine grained, Calcareous 85-95%; Calcite in small fragments, 5-15%; Qtz, fine, angular sand, 1-3% Pyrite <1%

Shale, light grey, very fine, Calcareous, 90-98%; Calcite content high but Xls large enough to distinguish only 1-3% Qtz, in minute, clear xls, 1%±

Shale, very Calcareous, grey, very fine grained, 85-95%; Limestone, grey to brown, 1-10%; Pyrite <1%

Shale, dark grey, Calcareous, some slightly iron stained, 90-98%; Limestone, brown, 1-5%; Pyrite, <1%; Sand 1-3%.

Shale, grey, highly calcareous, 90-98%; Limestone fragments, 1-3%; Sand ± 1%; Pyrite, a trace. (Some Cinders)

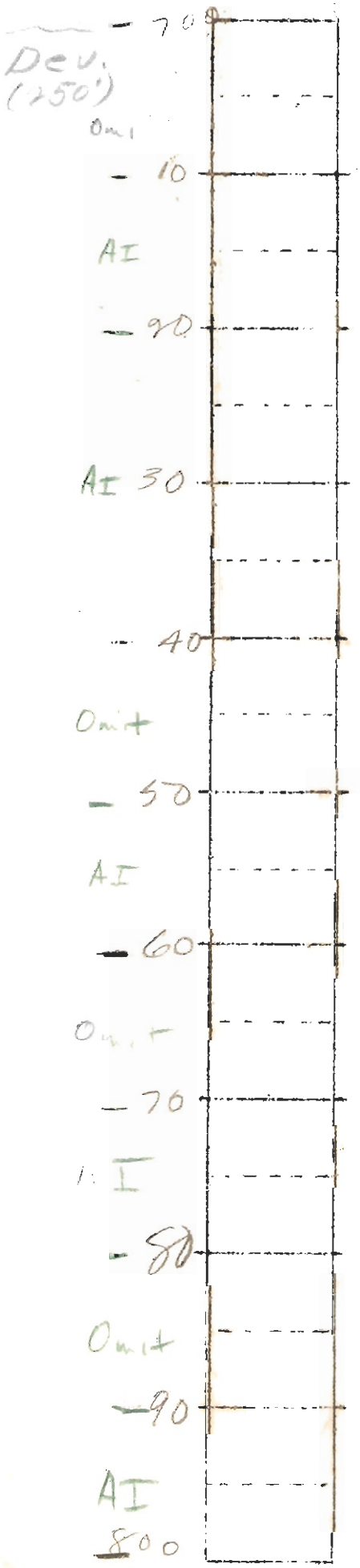
Shale, light grey, Calcareous, 50-60%

~~Limestone, dark grey, 40-50%~~

Pyrite, <1%

Name of Well Grinnell WW 015-1 Sheet No. 6

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



Limestone, brown, iron stained, 60-70%
Shale, grey, calcareous, 30-40%
Pyrite, ±1%; very Little sand.

Limestone, grey to buff, 80-90%
Shale fragments, 1-5%
Qtz in angular fragments, 1-5%
Pyrite ±1%.

Limestone, grey to buff, 85-95%;
Qtz, in angular fragments, 1-4%
Shale fragments grey, 1-4%.
Pyrite ±1%; Iron from bit.

Limestone, buff to cream, 88-98%;
Shale fragments, grey, 1 to 2%;
Pyrite ±1%; Qtz, angular, clear, 1-3%
Chert, ±1%.

Limestone, grey to buff, 75-85%
Shale, grey to green, 5-15%
Qtz, angular fragments, 1-10%
Chert, white, dense, 1-5%
Fossil fragments, bryozoa, crinoid stems etc.

Limestone grey, impure, insoluble residue high, 75-85%; Shale fragments, grey, calcareous, 20-30%; Qtz, Sand, ¼-½, 1-5%; Chert, 1-5%, Pyrite, ±1%. Iron stain on much of sample.

Limestone, gry to buff, (insoluble residue high) – 70-80%; Shale fragments, calcareous 5-15%; Qtz, in very minute fragments, 10-20%; Pyrite ±1%

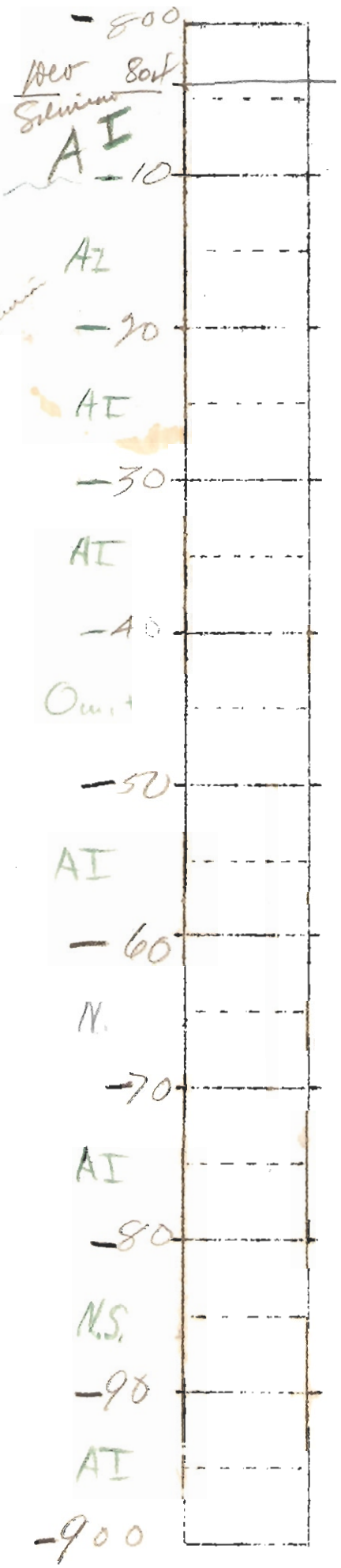
Limestone grey to buff, impure, insoluble residue high, containing some dolomite – 60-90%; Qtz continued to very minute fragments, percentage probably high. Shale, 5-10%;

Limestone, buff to grey, impure, 50-60%; Shale, 40-50%; Pyrite, in bright golden x's, ±1%; Sand, ½-¼, sub ang, 1 to 2%;

Shale, light grey, calcareous, 70-80%, Limestone 20-30%; sand, a trace, Pyrite ±1%;

Name of Well Grinnell, Wolsi Sheet No. 7

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



Limestone, cream to buff, 50-60%; Shale, 40-50%; Iron stained dolomite 1-10%; Gypsum - 1-5%; Pyrite <1%. Qtz, in minute fragments, 20-30%.

Limestone, buff, impure, 50-60%; Shale, 40-50%; Gypsum 10-20%; Qtz, in fragments averaging less than 1/8 mm, 20-30%; Pyrite <1%; Shellfrag.

Limestone, cream to buff, impure, 40-50%; Shale, 40-50%; Gypsum, 10-15%; Qtz included both in shale & Ls, 30-40%; pyrite <1%; bit + casing rust present; also some shell frag.

Limestone, 60-70% gry. to buff; Shale, 20-30%; Gypsum, 1-5%; a green mineral biaxial, pos; similar to Clinochlorite; 1 to 2%; (see Dup. in sample box) Qtz 10 to 20%.

Limestone, 70-80% - gry to buff, impure; Shale, 10-20%; Gypsum ±1%; Dolomite content high; Qtz, 20-30%; Green mineral similar that found @ 830-840 <1%.

Dolomite, brown to buff, 90-100%; Qtz, 20-30%; Sand, in rounded grains, 1/4 - 1/8, 1 to 2%; Pyrite <1%; Shale, 1 to 10%.

No Sample

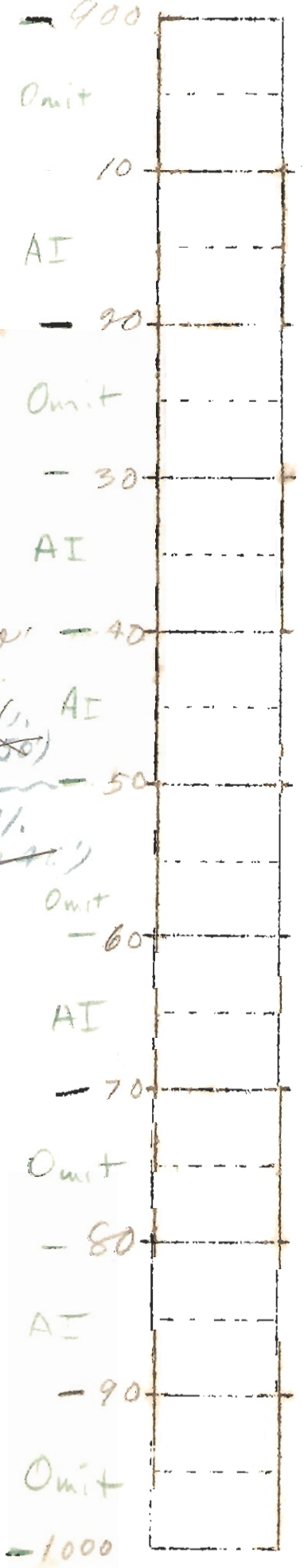
Ls, some Dol., 85-95%, impure, insoluble residue rather high, Gypsum ±10%; Chert, white, mottled, ±1%; Sand <1%

No Sample

Ls, Some Dolomite buff to brown, some iron stained; Qtz, rounded sand 1/4 - 1/8; 1 to 2%; Gypsum <1%

Name of Well Grinnell Waist Sheet No. 8

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



Limestone brown to buff, 50-60%; impure: Shale, calcareous, 30-40%, Pyrite <1%; a white, cryptocrystalline mineral, very soft, low index (Kaolin?) 1-5%

Dolomitic Limestone brown to buff 55-65%, impure, insoluble residue high; Shale, 30-40%; white mineral similar to that found above, (Kaolin?) 1-5%

Dolomitic Ls, brown-buff, impure, iron stained in part 75-85%; Shale 10-20% Qtz sand and in very minute frag - 1-2% very white, soft, fibrous mineral, fast ray to elongation, biref. rather low, indices 1.53 - May be Kaolin) -5%

Dolomitic Ls., brown to buff, 65-75%; Shale, 10-20%; Qtz in very minute grains incorporated in shale & dolomite; Gypsum, 1-5%:

Dolomitic Limestone, Some iron stained, buff to brown, insoluble residue high, 60-70%; Shale 15-25%; Gypsum, 1-5%; Qtz chiefly in shale, also in dol. 20-30%

Limestone slightly dolomitic brown to buff, iron stained, 70-80%; Shale 20-30%; Gypsum, 1-3%; (Kaolin?) - ±1%); Limonite <1%; Pyrite ±1%

Limestone, with some iron stained dolomite; buff to brown in color, impure, insoluble residue high; 60-70% - shale, 20-30%; Gypsum ±1%; Pyrite ±1%

Dolomite very impure, buff to brown, iron stained in part, insoluble residue high, 70-80%; shale, 10-20%; Pyrite ±1%; Gypsum 2-3%

Dolomite, impure, buff to brown, iron stained, 70-80%; Shale, 10-20%; Gypsum ±1%; Kaolin, ±1%; Pyrite, a trace.

Dolomite very whendry, brown wet, 85-95% Kaolin, in fragments, & intermixed with dolomite, 1-3%; Pyrite, ±1%; Chert, a trace; Qtz, clear, fresh xl's, 1 or 2%.

Name of Well Gunnell, W.O. 5-1 Sheet No. 9

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

1000
AI
1010
AI
1020
AI
1030
AI
1040
Omit
1050
N.S.
1060
AI
1070
Omit
1080
AI
1090
Omit
1100

Dolomite, grey in dry sample, brown to buff when wet, 85-95%; Kaolin, 10-20%; Qtz, in rounded grains and fresh x/s, 1-5%; Pyrite ± 1%;

Anhydrite, white to yellow, rounded by drilling, 60-70%; Dolomite brown to buff, 30-40%; Qtz rounded grains + in fresh frag., 10-20%; Pyrite 1%

Anhydrite, similar to that found at 1010-1020; 80-90% dolomite brn, buff Chert, 1-2%; Qtz 1-5%.

Limestone, nearly white, 60-70%
Anhydrite, white to nearly red (iron stain) 30-40%; Qtz in well rounded, grains, 1-5%; Chert, white, 10-20%
Pyrite ± 1%

Limestone, grey to white, 60-70%; anhydrite, white to reddish brown, 10-20%; sand, well rounded, ½-¼ mm, 10-20%; Pyrite < 1%; Chert, white, dense, 10-20%

No Sample.

Limestone, white to cream, dense, 50-60%; Chert, white, very dense, 40-50%; Anhydrite < 1%

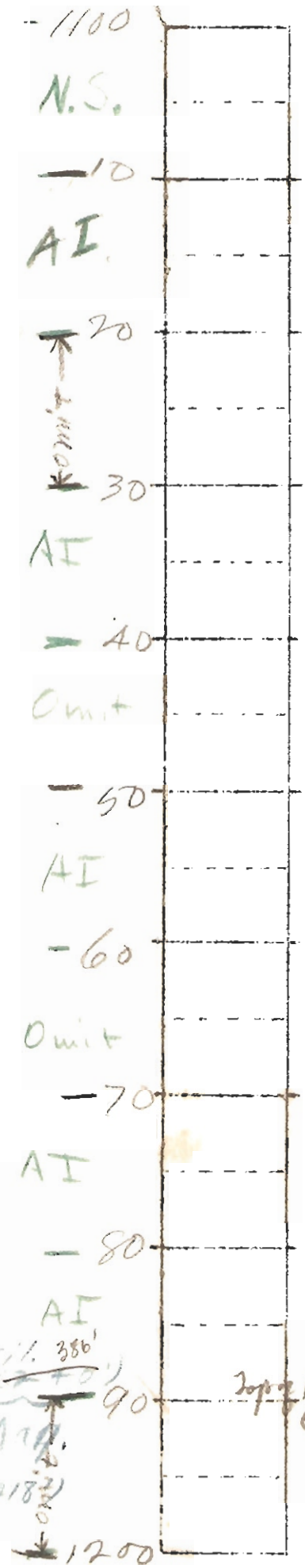
Limestone, white to very light cream, dense, 60-70%; Chert, white, dense, 30-40%; Anhydrite, a trace,

Limestone, dense, white, to cream, 70-80%; Chert, very white very dense, some translucent, 20-30%.

Limestone, dense, white, 70-80%
Chert, white very dense 10-20%
Dolomite, pink, iron stained, 5-10%
Pyrite 1%

Name of Well Gunnell West 1 Sheet No. 10

Depth Range 1100 - 1200 Scale; 1 inch=10 feet.



No Sample

Shale, Red, very calcareous, 50-60%; blue-grey Shale, 20-30%; Chert, white, dense, 15-25%; Limestone, 5-15%;

Limestone, grey to cream, containing some dolomite 75-85%; Dolomite, green (probably due to inclusion of green shale, 5-10%; Chert, white, 10-20%; Pyrite ± 1%; Red shale, 5-10%;

Limestone, white to grey, dense, 60-70%; Shale, light grey, 10-20%; Chert, dense, white, 10-15%; Dolomite, (Green as in 1120-30) 1-5%;

Limestone, white to cream, impure, 50-60%; Chert, cream to white, dense, some greenish, 20-30%; Shale, 30-40%; Pyrite 1%;

Dolomite, cream to buff, 70-80%; Chert, white, dense 10-20%; Shale, light grey, very calcareous, 10-20%; Pyrite 2%;

Dolomite, grey to pink, dense, 85-95%; Chert, hard, white, 1-5%; Pyrite < 1%; No sand observed.

Dolomite, grey to reddish brown, some almost pink, 90-98%; Chert, white, 1-5%; Kaolin, 2%;

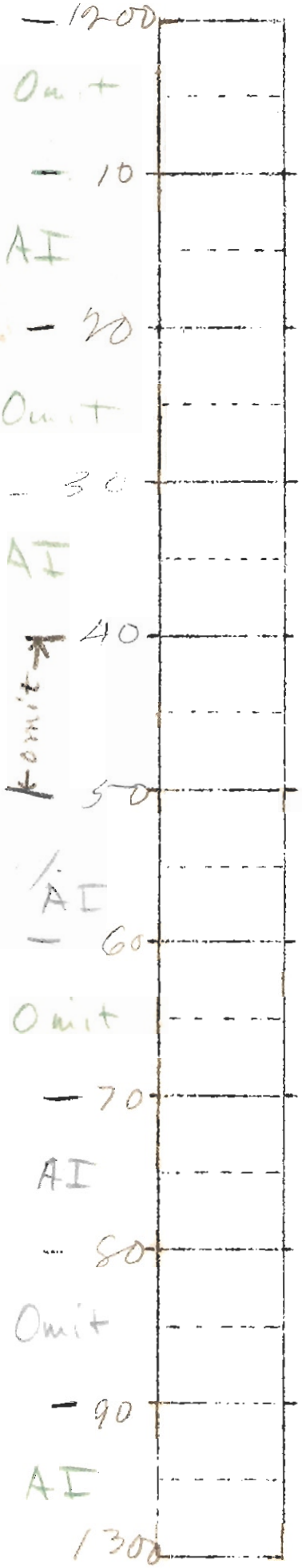
Dolomite, grey to buff, some pink, 70-80%; Chert, very white, dense, 10-20%; Pyrite - a trace; Qtz detrital, 1-5%;

Top of Maquoketa @ 1190'

Shale, blue, grey, greenish when wet, non calcareous, 90-98%; Chert, white, 1-5%; Kaolinite, or associated mineral, 1-5%; Qtz

Name of Well Gunnell, West Sheet No. 11

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



Shale, light-grey, darker when wet, 90-98%; Slightly calcareous; dolomite, (Probably carried down) 1-10%; Pyrite ± 1%; Kaolinite, ± 1%

Shale, Medium grey darker when wet, rather dense slightly calcareous, 90-98%; Pyrite ± 1%; detrital qtz, in fragments large enough to recognize 1-10% Kaolinite ± 1%

Shale, grey, blue-grey when wet, slightly calcareous, very fine, 90-98% Pyrite (or 2%; Dolomite, red, 1-3%.

Shale, grey, very slightly calcareous, nearly 100%; Pyrite ± 1%; dolomite, (or 2%; Sample also contains cinders.

Shale, grey slightly calcareous, very fine grained 95-98%; Pyrite, (or 2%; aggregates of silt cemented by dolomite, 1-3%; Also contains Cinders.

Shale, grey, very slightly calcareous, fine, 95-99%; Pyrite ± 1%; iron stained dolomite, (or 2%; a very few shell fragments (Ordovician)

Shale, grey to brown, very fine, slightly calcareous containing some carbonaceous material, 90-95%; calcite and dolomite, (or 2%; Pyrite ± 1%

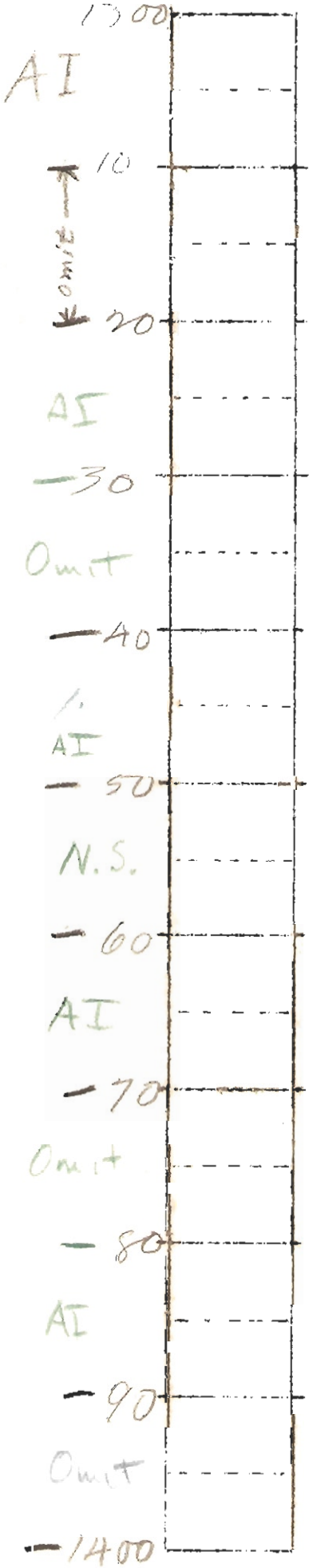
Shale, grey to brown, carbonaceous, containing minute fragments of fossils, 95-98%; Calcite & dolomite, 1-5%; Pyrite, ± 1% (used Cinders)

Shale, grey, slightly calcareous, 90-98% Pyrite ± 1%; Calcite and dolomite, 1-3%.

Shale, grey, slightly calcareous, 90-98%; Pyrite (or 2%; dolomite and Calcite, 1-3%.

Name of Well Grinnell Well #1 Sheet No. 12

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



Shale, light grey, very finely divided, calcareous 95-98%; Pyrite, ±1%; Calcite & dolomite, 1-10%; Used cinders,

Shale, light grey, very calcareous, 85-95%; dolomite, 10-20%; Pyrite ±1%; Coal and cinders used in drilling

Shale, grey, 60-70%; Dolomite, in very minute fragments incorporated in the shale, 40-50%; detrital Qtz, 1-10%; Pyrite + 1% (Coal+Cinders used)

Shale, brown, nearly black when wet, nearly 100%; very fine grained, concoidal fracture; Pyrite <1%; Some iron oxide,

Shale, grey-brown, very fine grained, very slightly calcareous, nearly 100%; Dolomite + Calcite, a trace; light colored isotropic mineral, index about 1.5-2, cleavage good in at least 1 dir, about 1%.

Shale, dark grey, very calcareous, 60-70%; dolomite, 30-40%; Pyrite very abundant, 1-5%; Qtz, 1-5%;

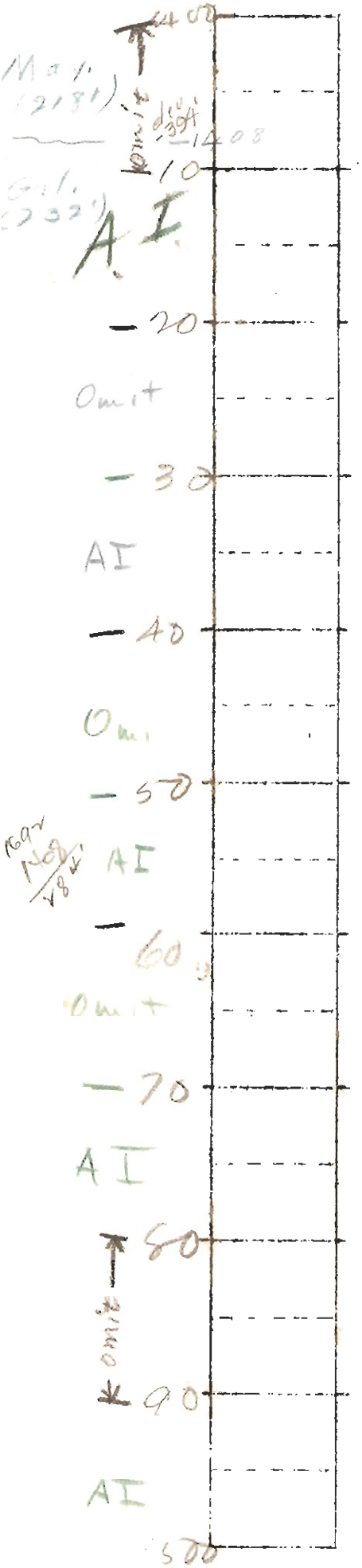
Shale, grey to blue-green, calcareous, 80-90%; Dolomite, 10-20%; Pyrite, ±1%.

Shale, grey to dark grey; nearly 100%; Qtz, ±1%; Dolomite + calcite, 1-10%; Pyrite <1%

Shale, grey to brownish grey, nearly 100%; Pyrite <1%; Calcite & dolomite 1-5%.

Name of Well Gunnell Wright Sheet No. 13

Depth Range 1400-1470 Scale: 1 inch=10 feet.



Shale, grey, very calcareous, 50-60%
dolomite, brown to reddish, containing
considerable iron, 40-50%; Pyrite 1-10%
Qtz, in minute grains, 10-20% Kaolin± 1%
Dolomite, brown, iron stained,
80-90%; Shale, grey, 5-15%;
Kaolinite, 1%±; Pyrite 1 or 2%; Iron
oxide abundant, 1-5%
Dolomite, buff to brown,
50-60%; shale, grey-brown,
iron stained 40-50%; Pyrite, <1%
Sphalerite(?) <1%; Feldspar, a Trace.
Dolomitic Limestone, grey to
brown, sample groundvery fine, 70-80%
Shale, grey, 10-20%; Pyrite <1%.

Dolomite, light grey, pure, but
so badly crushed as to retain
few pieces larger than 1/16 mm; 85-95%
Shale, a trace, Pyrite <1%
Dolomite, light grey to buff, 90-95%
Shale, green-grey, 1-5%; Chert,
a trace; Pyrite <1%

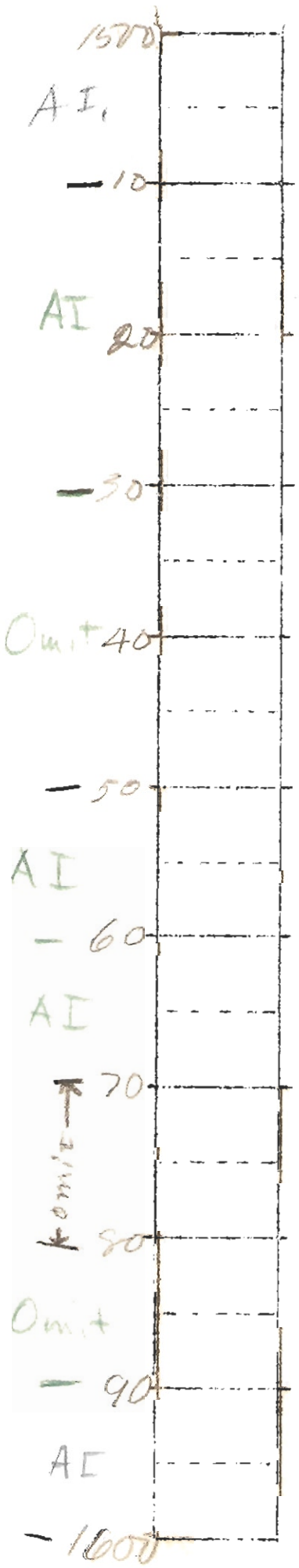
Dolomite, grey to buff, very pure,
90-98%; green-grey Shale 1-2%
Chert, a trace. Iron oxide ± 1%;
Probably from bit.
Dolomite, identical with that
in 1460-70.

100%

Dolomite, same as 1460-1470 ± 100%

Name of Well Grannell, Wells 1 Sheet No. 14

Depth Range 1500 - 1600 Scale: 1 inch=10 feet.



Dolomite, grey to buff, pure, 80-90%; Shale, light grey, 10-20% Chert, 1-5%

Dolomite, buff, slightly iron stained, 85-95%; chert, white, dense, 5-15%

Dolomite, similar to that in 1570-1590. Chert, 10-20%

Dolomite, brown to light buff, 85-95%; Chert, light grey to white, dense, 1-5%; Casing rust, 1 to 10% Kaolinite ± 1%

Dolomite, buff to grey, 80-90% Chert, white, dense, 5-5%; Shale, grey, 1-10%; Kaolin(?) ± 1%

Dolomite, buff to brown, some iron stained, 85-95%; Shale, grey, 1-10%; Kaolin(?) ± 1%

Dolomite, buff to cream, very pure, 95-98%; Pyrite, in very minute xls, <1%; Kaolin(?) ± 1%; Chert a trace.

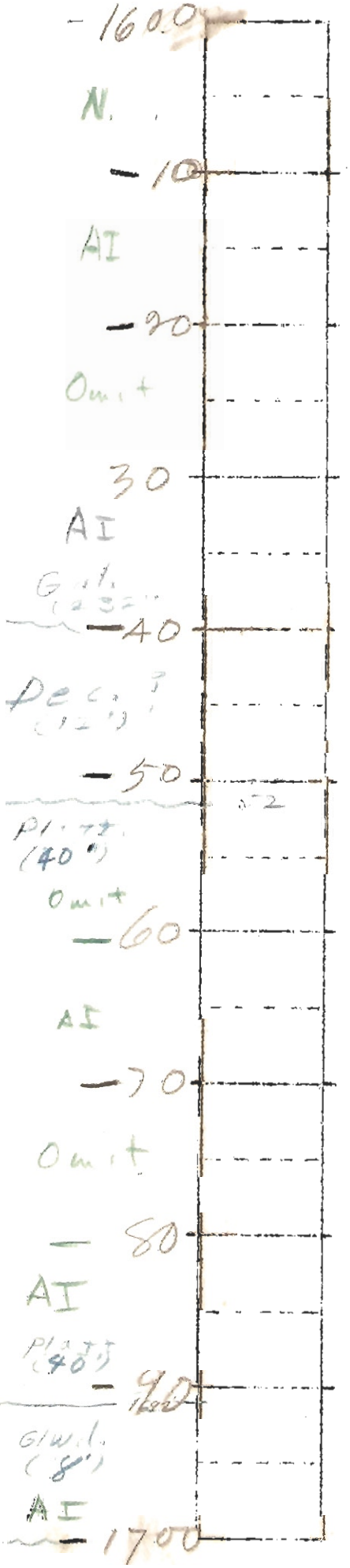
Dolomite, grey to light buff, 85-95%; Chert, white, 1-5%; Pyrite, or chalcopyrite 1 to 2%.

Dolomite, buff to grey, pure, 90-95%; Chert, 1-10%; Pyrite, a trace.

Dolomite, grey to light buff, Pure, 90-95%; Pyrite 1 to 5%; Chert to 2%;

Name of Well Grinnell unit 1 Sheet No. 15

Depth Range 1600 - 1700 Scale: 1 inch=10 feet.



No Sample

Dolomite, buff to brown, iron stained, 85-95%; Chert, white, not very dense, 5-15%; Pyrite 1 or 2%

Dolomite buff to brown Some slightly iron stained, 85-95% Chert, 1-5%; Pyrite <1%

Dolomite, buff to brown, 50-60% Ferrodolomite(?) in large flaky pieces, 40-50%; may be siderite, with iron staining; Qtz, Clear, XLs, ±1% Pyrite <1% Feldspar, a trace; Chert ±1%

No Sample

Dolomite, grey to light buff, 60-70%; Shale, green, some pyrite included, 10-20%; Qtz, 1-10%; Feldspar, <1% Ferrodolomite(?) as in 1650-60 <1%

Dolomite, buff to brown, Some iron stained, 70-80%; Qtz, in rounded sand, 1/4-1/8 average, 5-15%; Shale, green, 1-5%; Feldspar, <1%; Pyrite <1%

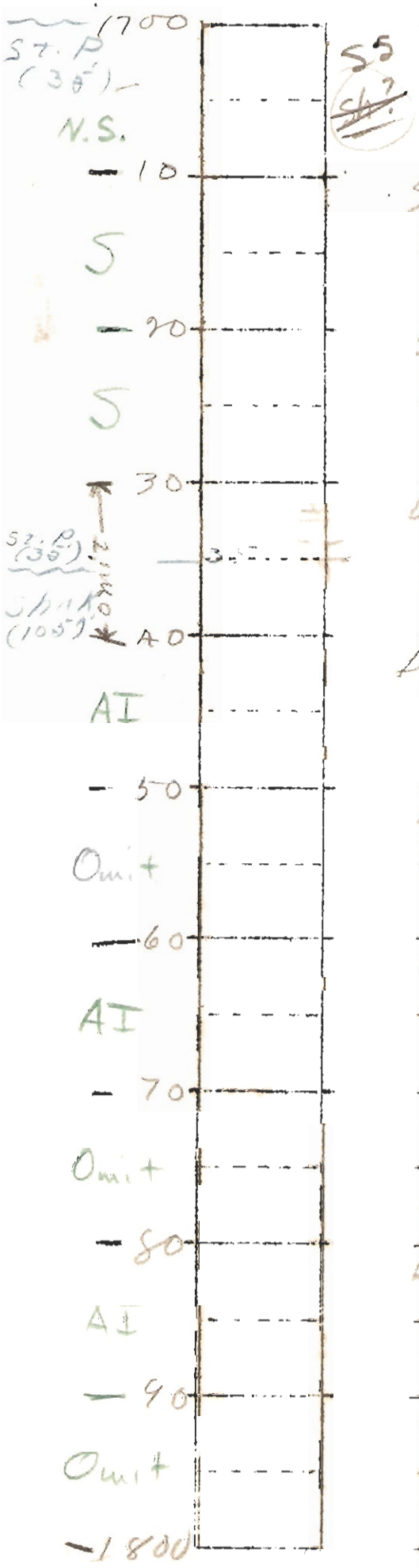
Dolomite, buff to brown, some iron stained 80-90%; Qtz, in rounded sand, 1/4-1/8 mm, 1-10% Pyrite <1%;

Dolomite, grey to buff, iron stained in part, 90-98%; Qtz, 1 or 2%; Pyrite, <1%.

Shale, dolomitic, grey-green, very fine, plastic when wet, 70-80%; Dolomite, similar to that in 1680-90, 10-20%; Qtz, ±1%.

Name of Well Grinnell/Wolfe Sheet No. 16

Depth Range 1700 - 1800 Scale: 1 inch=10 feet.



S5 Cl?

No Sample

Sandstone, pure Qtz, well rounded, size averaging ¼-⅛, sample nearly 100% sand, with exception of a few pieces of dolomite + green shale.

Sandstone, pure Qtz, well rounded, size averaging ¼-⅛, Sample nearly 100% sand; dolomite + green Shale ±2%.

Dolomite, buff to brown, 50-60%. Sand, similar to that found in 1720-1730, 40-50%; Chert, white, dense, 1-5%; Grn. Shale ±1%.

Dolomite, buff to brown, 60-70% Sand similar to that found in 1720-30, 30-40%; Chert, white dense 1-5%.

Dolomite, buff, 70-80%; Sand, Pure Qtz, 90-30%, ¼-⅛ predominating, some secondary enlargement, chert white, dense, 1-5%; Pyrite ±1%.

Dolomite, buff, 70-80%; Sand, Pure Qtz, well rounded, about 50% showing secondary enlargement, 20-30%; Pyrite ±1% Ortho. Feldspar <1%

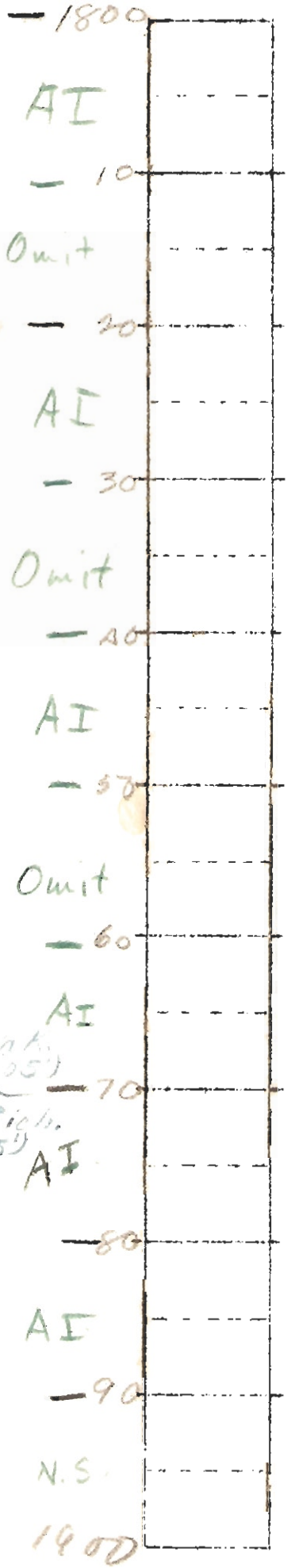
Dolomite, buff, 65-75%; sand, pure Qtz, well rounded, some showing secondary enlargement, 30-40% Orthoclase feldspar <1%; Pyrite ±1%

Dolomite, very finely crystalline, light cream to buff, nearly 100%; Qtz. sand ±1%

Dolomite, very finely crystalline, Lt. cream to buff, 80-90%; Qtz sand, 5-15%, Chert, some oölitic ~2%.

Name of Well Grinnell/Wolst Sheet No. 17

Depth Range 1800 - 1900 Scale: 1 inch=10 feet.



Dolomite, grey to buff finely crystalline, 40-50%; Qtz, fine grained, ¼-½, some ~~showing secondary enlargement 30-40%~~ Chert, white, some oölitic, 5-15%; ~~orth. feldspar <1%~~

Dolomite, buff to cream, 50-60% Qtz, similar to that in 1840-1850, 25-35% Chert, white, oolitic, 1-10%; grn. Shale, ±1%

Dolomite, light cream to buff, 50-60%; Qtz, in angular frag. some secondary enlargement, 40-50%, Chert, 1-5%.

Dolomite, cream to almost white, 80-90%; Qtz, in small fragments, some secondary enlargement, 10-20%, Chert <1%

Dolomite; cream to nearly white, 70-80%; Qtz, small fragments, secondarily enlarged.

Limestone, dolomitic, cream to nearly white, very finely crystalline, 85-95%; Qtz, similar to that in 1840-50, 1-10%.

Limestone, dolomitic, cream to nearly white, finely crystalline, 80-90%; Qtz, Like that in 1840-50, 5-15%; Pyrite <1%

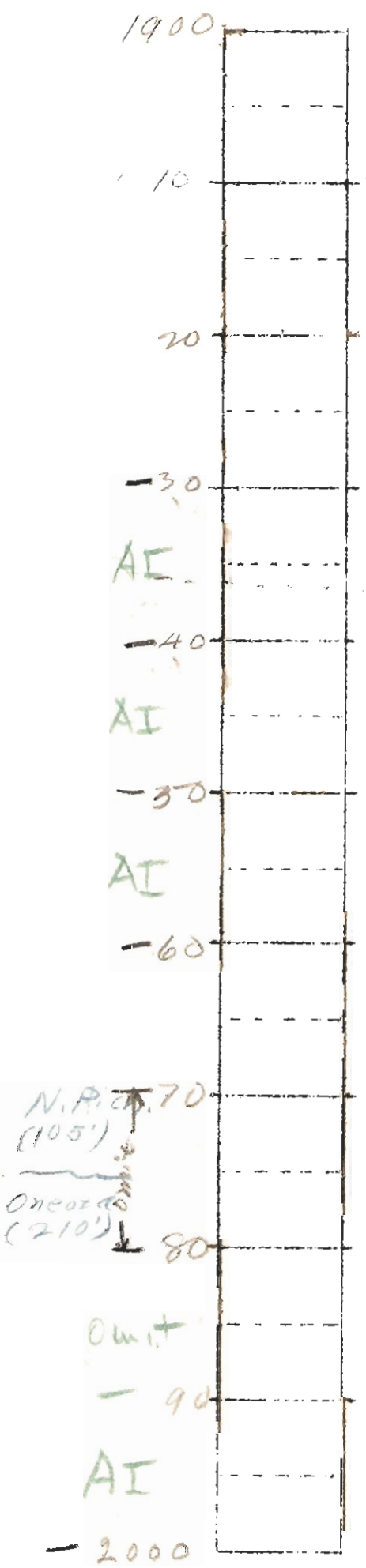
Sandstone, white, ½-¼ Predominating, 80-90% is sub-angular, showing secondary enlargement; Dolomite, 1-10% Orth. feldspar <1%

Dolomite, cream to light buff, 90-98%; Qtz, fine frag. some secondary enlargement, 1-5%.

No Sample

Name of Well Gunnell Wolsl Sheet No. 18

Depth Range 1900-2000 Scale: 1 inch=10 feet



No Sample

No Sample

No Sample

Sandstone, 80-90%; size 1/3-1/4 predominating, secondarily enlarged; Dolomite, buff, 5-15%; a large amt of Iron from casing + drill

Sandstone, 85-95%; size 1/4-1/8 predominating, subangular, Some secondary enlargement; Dolomite, 1-5%; a large amt of Fe from casing + drill

Sand stone, pure white, nearly 100%; Sand 1/4-1/8, angular to subang; some sec. enlargement. Orth. Feldspar a trace, Dolomite, 1%

No Sample

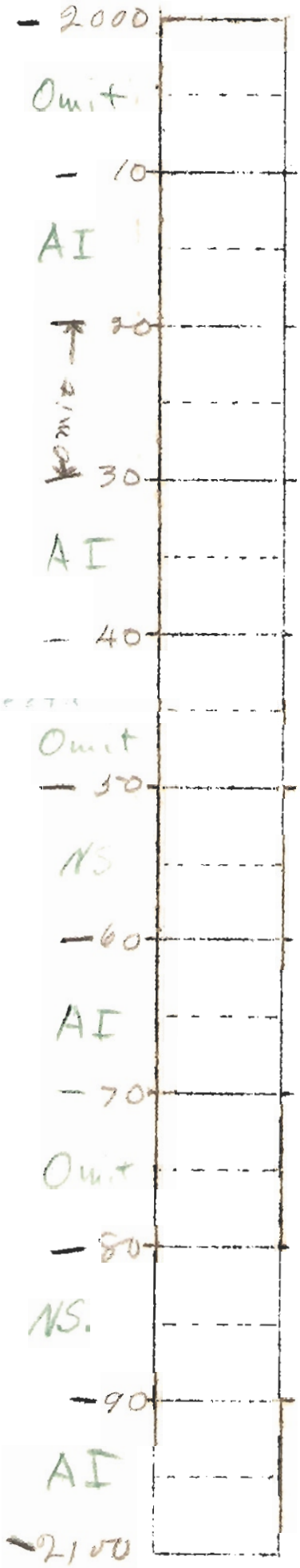
Dolomite, white to light grey, 40-50% Qtz in minute, angular fragments, 1/8-1/16 average, some showing sec. enlarg., 40-50%

Dolomite, white to grey, with some calcite, 85-90%; Qtz in minute angular frag, showing secondary enlargement, 10-20%

Dolomite, white to grey, some calcite, 90-95%, Qtz, minute fragments, some second. enlarg, 1-10%

Name of Well Gwinnell/WO151 Sheet No. 19

Depth Range 2000-2100 Scale: 1 inch=10 feet.



Dolomite cream to white, very fine grained, 90-99%; Qtz, 1-5%; Chert < 1%.

Dolomite cream to white, very finely xline, 90-95%; Qtz, in rounded grains & angular fragments, some secondary enlargement, 1-10%; Glauconite < 1%

Dolomite, pure white to cream, coarser x/s than in samples 2000-2020, nearly 100% pure; Qtz, 1-2%.

Dolomite cream to white, 60-60% Chert, dense, white 40-50% Qtz, clear, fresh x/s, 1-2% Glauconite < 1%

Dolomite cream to light buff, 60-70%; Chert, dense, white, 25-35%; Qtz, fresh x/s, some due to secondary enlargement, 1-10%

Dolomite, buff to cream, finely xline, 80-90%; Chert, white, dense, 10-20%; Qtz, 1-2%;

Dolomite, buff to cream, finely xline, 65-70%; Calcite, in water clear x/s, showing twinning, 1-10%; Chert, white, dense, 10-20%; Qtz, 1-5%.

No Sample

Dolomite, light grey, 80-90%; Calcite, clear x/s, showing twinning, 1-5%; Chert, 1-10%

Name of Well 2100 - 2200 Sheet No. 20

Depth Range _____ Scale: 1 inch=10 feet.

2100

N.S.

No Sample

—10

Dolomite, cream to buff, rather finely crystalline, 80-90%; Calcite clear, showing twinning ±1%; Qtz, 1-10%; Chert, white, 1-10%; Pyrite ±1%; ortho. feldspar ±1%

AI

—20

Dolomite cream to buff, rather finely crystalline, 80-90%; Chert, very white, 5-10%; Calcite clear xls, many of them twinned, 1 or 2%;

Omit

—30

Dolomite, cream to buff, 85-95%; Chert, 1 to 2%, very white Qtz, 1-5%.

AI

—40

Dolomite, cream to buff, nearly 100%; Chert, ±1%

Omit

—50

Dolomite, cream to light buff nearly 100%; finely crystalline; Chert ±1%; Qtz, ± 1 or 2%

AI

—60

Dolomite, very light buff to cream Colored, ±100% Perhaps a few minute fragments of Quartz.

Omit

—70

Dolomite, buff, much more coarsely xline than 2150-70, 85-95%; Sand, sub angular, 1/2-1/4, 1 to 10%

AI

2190
1014
1176

—80

Dolomite, Light buff, finely crystalline, Powdered in part by drill, 85-95%; Qtz, in sand & minute fragments 1-10%; Sandstone, 1/2-1/4 size predominating, subangular 85-95%; some show secondary enlargement. Dolomite 10-15%

Omit (2100) AI

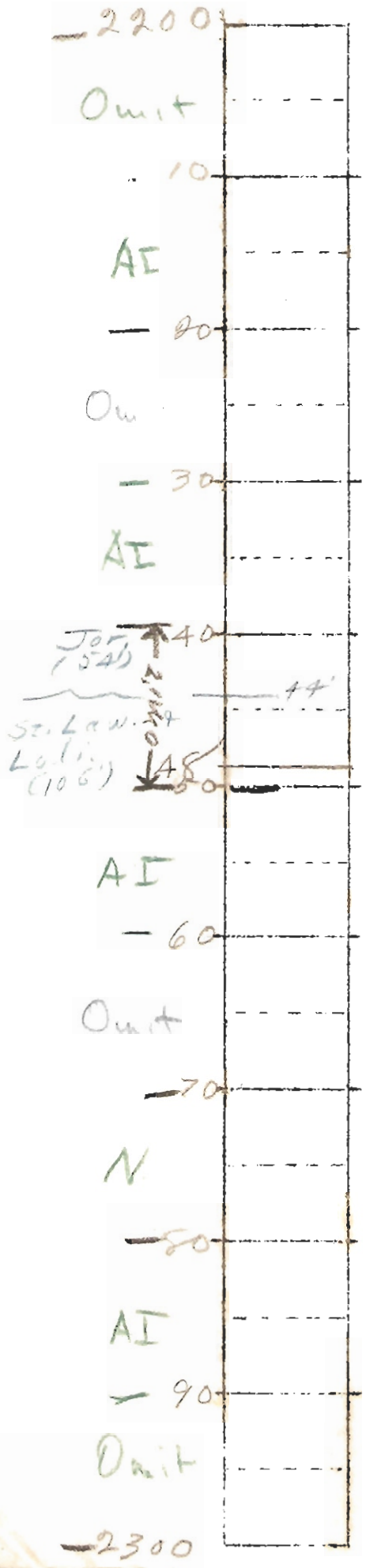
—90

Jor. (54) AI s(?)

—2200

Name of Well Grinnell Waist Sheet No. 21

Depth Range 2200-2300 Scale: 1 inch=10 feet.



Sandstone, white, qtz. sand, 1/2-1/4 predominating, secondary size 1-1/2; sub-round to subangular; sand = 60-70%; Dolomite, cream to buff, 40-50%.

Sandstone, white, 70-80%; sand 1/2-1/4 predominating, subangular to subround; some secondary enlargement; Dolomite 20-30%.

Sandstone, white, 1/4-1/8, subround, some secondary enlargement, 70-80; Dolomite, 20-30%.

Sandstone, white, 1/4-1/8 predominating, subangular secondary enlargement common, 80-90%; Dolomite, 10-20%

Dolomite, cream to light grey, very finely xline, 50-60%; Qtz fragments, 1/8-1/16, 40-50%; sand, 1/4-1/8 ± 2%;

Dolomite, grey to buff, fine-grained, 90-95%; Qtz, 1-10%; chiefly fragmental, but some rounded sand grains,

Dolomite, brown, iron stained, 60-70%; Qtz, well rounded to angular fragments, some iron stained, 30-40%; Iron oxide, 1-5%.

No Sample

Dolomite, dark grey to buff, 80-90%; Qtz, small angular fragments, showing secondary enlargement, 1-10%; Iron oxide abundant

Dolomite, light grey to buff, finely crystalline, 90-98%; Qtz, in fine fragments, showing secondary enlargement, 1-10%.

Name of Well Grinnell W0151 Sheet No. 22

Depth Range 1300-2400 Scale: 1 inch=10 feet.

2300

No Sample

— 10

AI

Dolomite, grey, rather dense, 85-95%; Qtz, in minute frag. showing secondary enlargement, 1-5% Pyrite ± 1%;

— 20

No sample

— 30

AI

Dolomite, medium grey, very finely crystalline, 90-98% Qtz, 1-5%; Pyrite <1%

— 40

St. Law. + Lodi. (106')

No sample

— 50

Fran. (150') ↓

AI

Dolomite, grey, finely crystalline, 85-95%; Qtz in minute fragments, a few larger sand grains, 1-5%; Pyrite <1%

— 60

70

No Sample

— 80

AI

Dolomite, light grey, pure, finely xline, 90-98%; Glauconite 1-2%; Pyrite <1%. Quartz 1-5%

— 90

AI

Dolomite, greenish-grey, very finely crystalline 90-98%; Glauconite, 1-2%; Quartz 1-5%

— 2400

Name of Well Grunnell West Sheet No. 23

Depth Range 2400 - 2500 Scale: 1 inch = 10 feet.

2400

Dolomite, grey, finely crystalline, 90-95%; Glauconite, 0-2%; Orth. Feldspar, a trace; Qtz, 1-3%.

Omit

10

Dolomite, grey to white, pure, 90-95%; Glauconite, 0-2%; Qtz, 1-5%

AI

20

No Sample

30

40

From ↓

50

60

Dolomite, grey, finely crystalline, 90-95%; Glauconite, 1%; Quartz, 1-5%, a little iron stain.

AI

70

Dolomite, grey to buff, finely crystalline dense, nearly 100%. Glauconite, <1%; included in some of the larger dol. fragments. Detrital Qtz, 1%

Omit

80

Dolomite, very finely crystalline, nearly a powder in sample, grey, 90-95%; Qtz in rounded 1/4 - 1/8, 1-10%; Glauconite, a trace.

AI

88

Dolomite, very finely crystalline, 85-95%; Glauconite, in very small rounded, 1-5%; Qtz, 1/4 - 1/8, 1-5%.

Omit

95

Dolomite, finely xline, similar to 2485-95'; Glauconite, 1-2%; Qtz, ang; 1-5%.

AI

2500

This Ltr. refers to Grinnell #6 Well

August 7, 1936

Reed Ice Cream Company
Des Moines, Iowa

Gentlemen:

As mentioned in our conversation last Monday, I am enclosing herewith a copy of the water analysis showing the composition of water developed from the new No. 6 well at Grinnell, Iowa. This well is 2498 feet deep. The casing is continuous and sealed to 1700 feet which is at the top of the St. Peter sandstone. Including and below the St. Peter the formations are open so that all water-bearing horizons can contribute to the total production from the well. The well is capable of producing better than 500 gallons per minute with a drawdown of about 15 feet below static level of 265 feet.

The composition of the water is quite different from that produced in the Des Moines area, and would be a very desirable type of water for your purposes. However, from the fact that your well shows a St. Peter production of poor quality, while the Grinnell also produces a part from the St. Peter, it is believed that the water from the Jordan might be of mineralization similar to that of the St. Peter at Des Moines.

The temperature of the water which is principally from the Jordan formation at Grinnell is 74.2° F. at an air temperature of 82° F. taken from within 2 feet of the ground in the large flow pipe off of the well.

I will make further studies concerning the possibilities of developing a reasonably good quality of water from the Jordan sandstone in the Des Moines locality and will be glad to discuss this with you at a later date.

Yours very truly,

A. C. Tester

ACT:A
Dictated August 6.