



The Rig at Lenox

LENOX, IOWA WELL LOG

Drilled 1934-35

Curb Elevation 1297 feet

Taylor Co

W-011-7

LEGEND



Loess

Gumbotil

Leached & Oxidized Drift

Oxidized & Unleached Drift

Unoxidized & Unleached Drift

Coarse sand or Gravel

Siltstone

Shale, gray and green

Shale, black

Coal

Shale, red

Limestone

Limestone, shaly

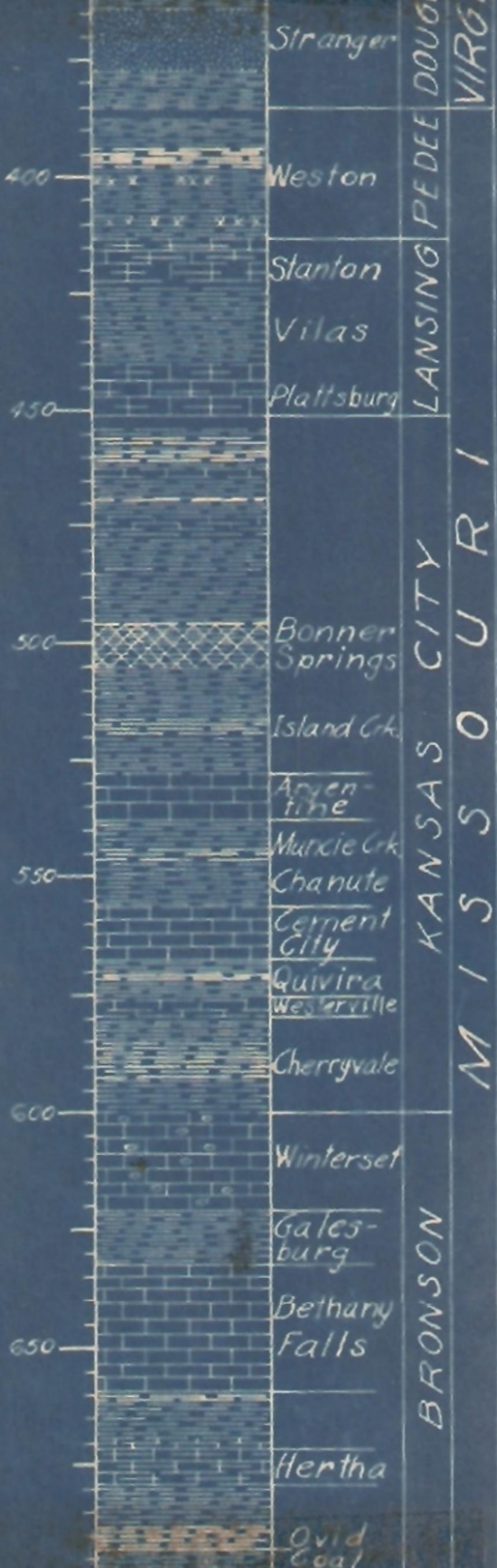
Limestone, cherty

Sandstone

Depth Correction

Interpretation
of Cable





Stranger

DOUGLAS

VIRGIL

400

Weston

PEDEE

Stanton

LANSING

Vilas

150

Plattsburg

CITY

500

Bonner Springs

KANSAS

UR I

Island Crk.

CITY

Argentine

Murcie Crk.

550

Chanute

MISSOURI

Cement City

Quivira

Westerville

Cherryvale

600

Winterset

BRONSON

Galesburg

Bethany Falls

650

Hertha

Ovid Coal

PENNSYLVANIAN

1100

1150

1200

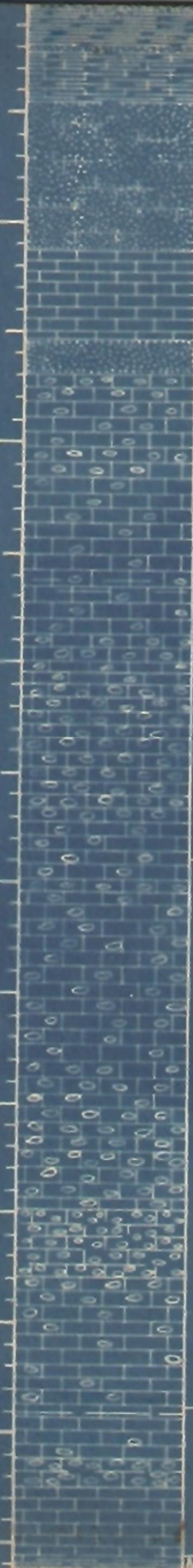
1250

1300

1350

CHEROKEE
DES MOINES SERIES
PENNSYLVANIAN

1750
1700
1650
1600
1550
1500
1450



Ste.
Genevieve

St. Louis

Keokuk

Burlington

Hampton

MERAMEC

OSAGE

KINDERHOOK

MISSISSIPPIAN

Maule Hill

Lenox Taylor
W-0117

100

200

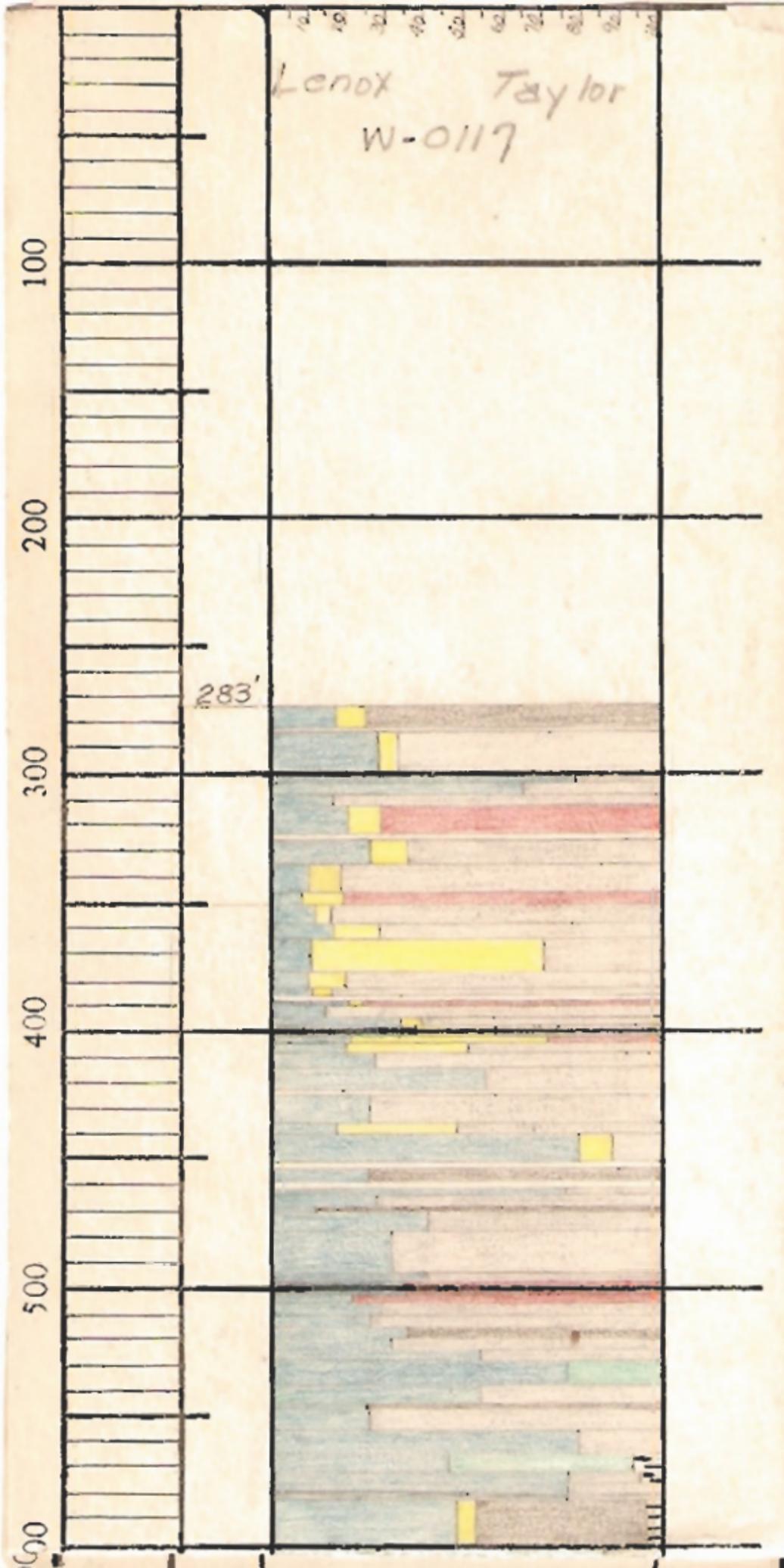
300

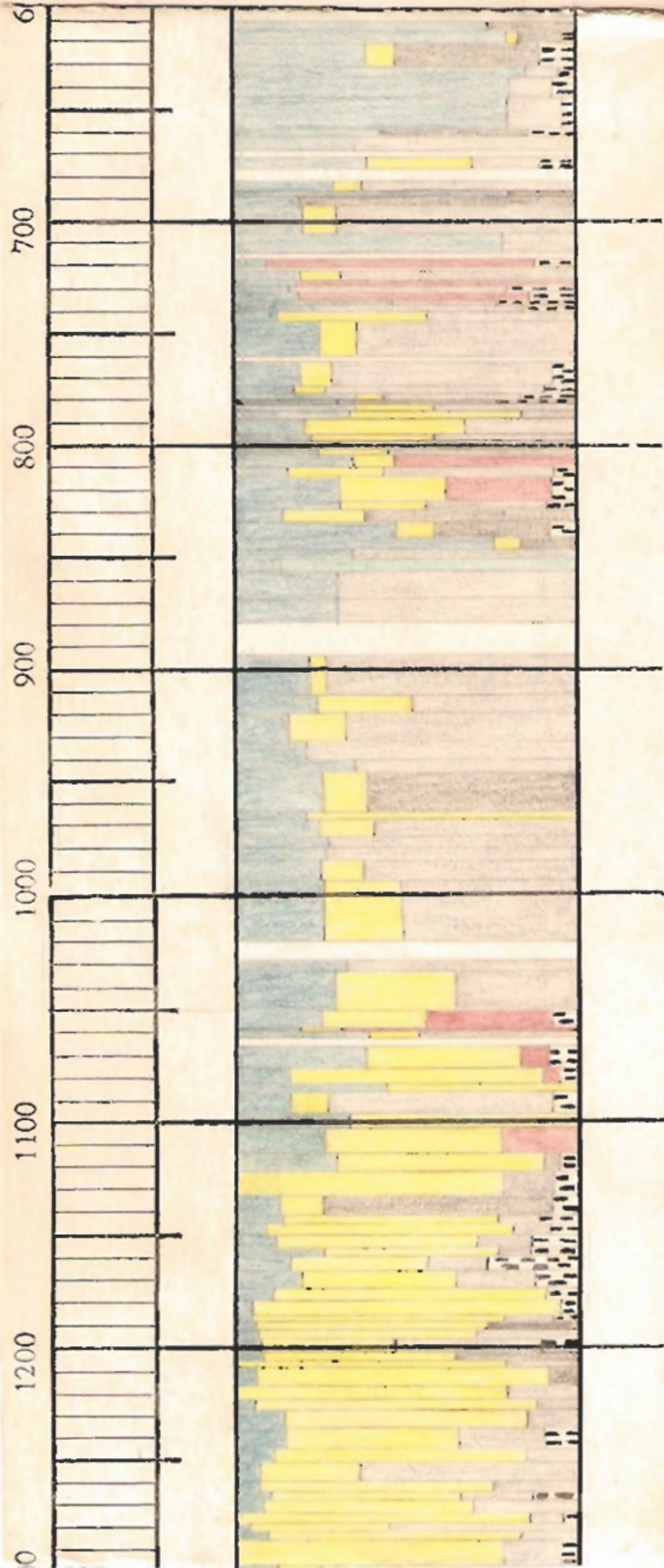
400

500

600

283'





IOWA

MISSOURI BUREAU OF GEOLOGY & MINES, ROLLA, MO.

MO SURVEY NO 3520	OWNER E. R. A.
----------------------	-------------------

COUNTY (Iowa) Taylor	FARM Lenox	WELL NO
-------------------------	---------------	---------

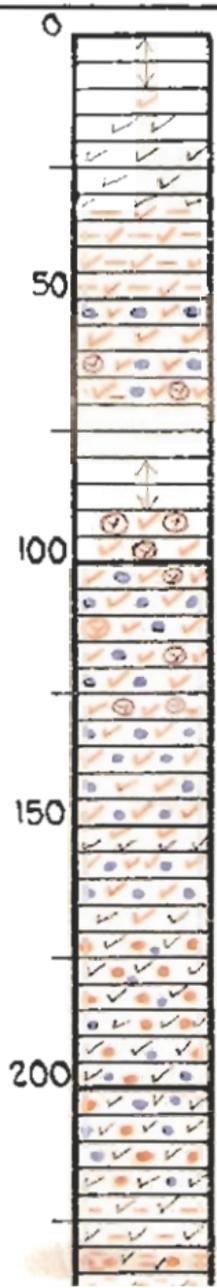
T 70 N	R 22 W	DRILLER
DATE		

	8		

ELEVATION 1297	PRODUCTION
-------------------	------------

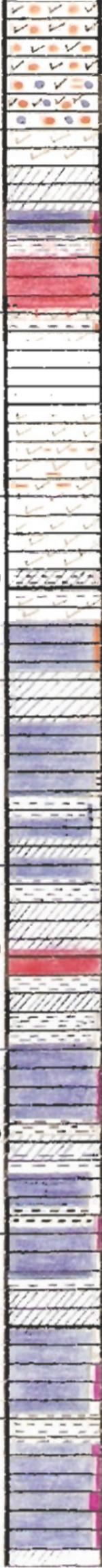
SAMPLES STUDIED Hundhausen

REMARKS



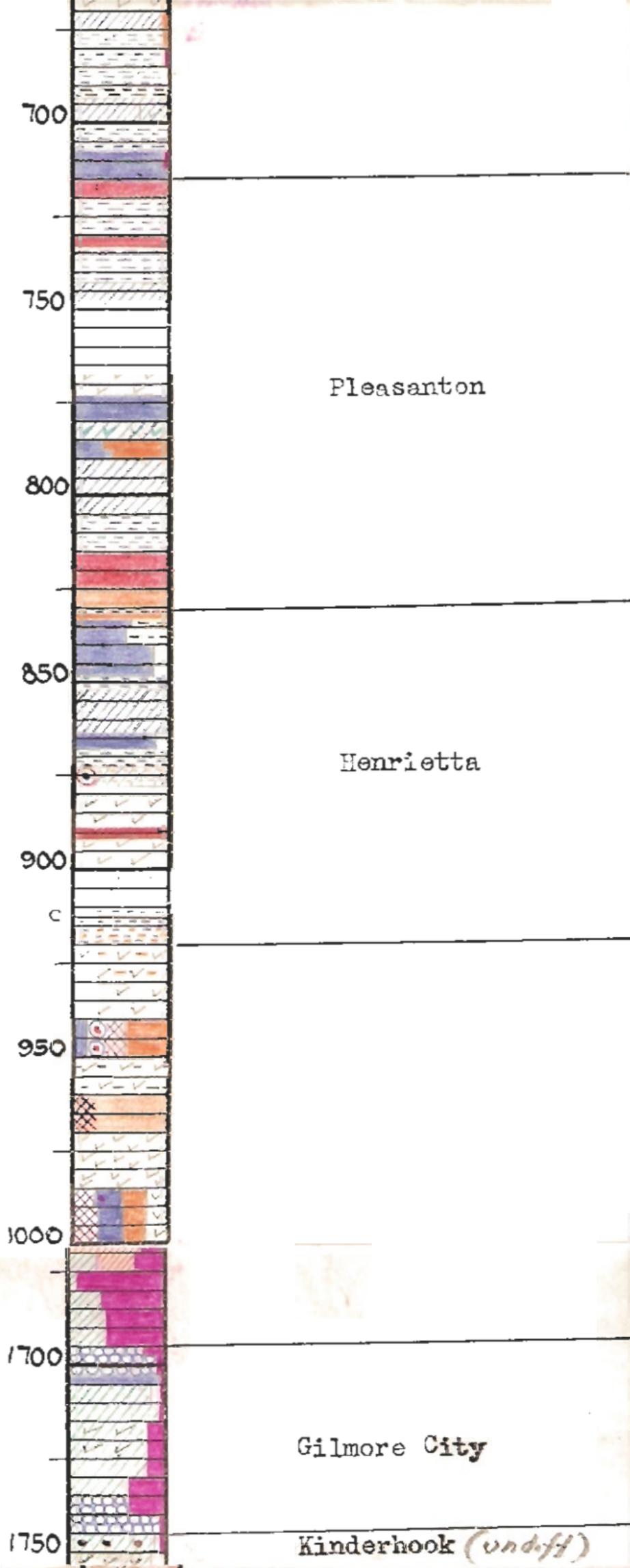
Glacial Drift

250
300
350
400
450
500
550
600
650



Douglas

Kansas City - Lansing



700

750

800

850

900

c

950

1000

1700

1750

Pleasanton

Henrietta

Gilmore City

Kinderhook (undiff)

1350

1400

1450

1500

1550

1600

1650

1700

1750

Ste. Genevieve ?

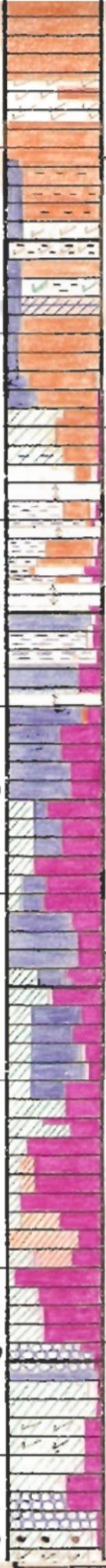
St. Louis

Warsaw

Burlington - Keokuk

Gilmore City

Kinderhook (*undiff*)



1800

1850

350

400

450

500

550

600

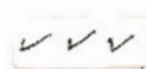
LEGEND



No Samples



Tan Silt



Gray Clay



Sand



Limestone Fragments



Igneous Fragments



Pebbles



Gray Shale



Calcareous Shale



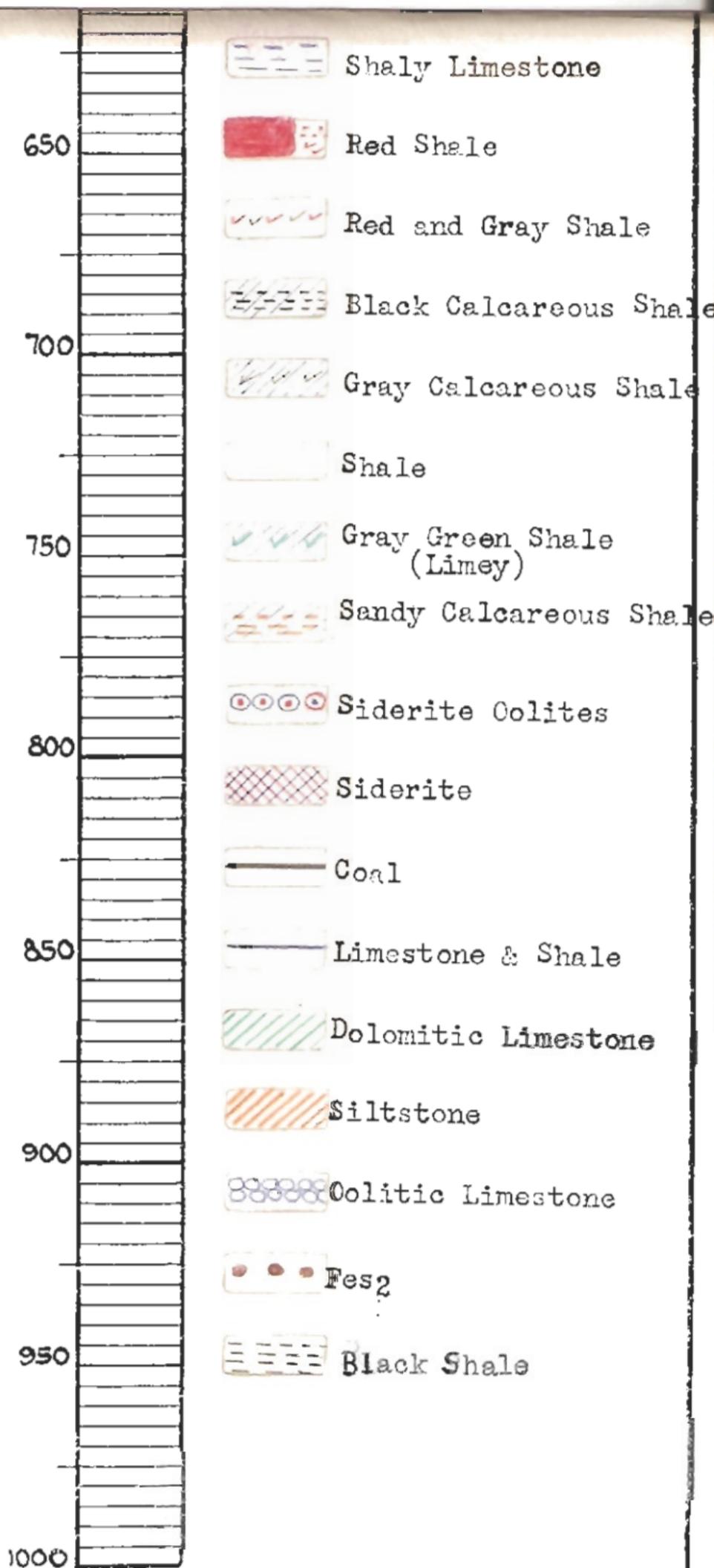
Limestone



Sandstone



Chert



WRD Exp. (OM)
Aug. 1964

Verified PMJ

U. S. DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

Water Resources Division Well Schedule Form

MASTER CARD

Record by D. AARONSON Source of data FILE Date 8/3/65 Map 1:63,360 COUNTY HWY
State IOWA County (or town) TAYLOR 87

Latitude: 40° 52' 41" N Longitude: 091° 43' 32.5" W Sequence number: 1

Lat-long accuracy: 2' T 700 S, R 32 Sec 8 NWNW1/4, SESE1/4, NW 1/4

Local well number: 07032W086d4b6 Other number: W-0117

Local use: 00117 CITY 1 Owner OF name: LENOX CITY #1

Owner or name: LENOX Address: LENOX, IOWA

Ownership: County, Fed Gov't, City, Corp or Co, Private, State Agency, Water Dist M

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

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

DATA AVAILABLE: Well data 1 Freq. W/L meas.: INVENTORY Field aquifer char. 0

Hyd. lab. data: 0

Qual. water data: type: COMPLETE

Freq. sampling: ORIGINAL Pumpage inventory: 0 period: 0

Aperture cards: 0

Log data: GEOLOGIST LOG

WELL-DESCRIPTION CARD

SAME AS ON MASTER CARD Depth well: 1757 ft 1757 Meas. rep. accuracy: 6

Depth cased: (first perf.) 1512' 7" ft 1513 Casing type: STEEL ; Diam. 8 5/8 in 9

Finish: (C) porous concrete, (P) gravel w. (S) horz. open (H) screen), (I) saltery, (N) and, (F) perf., (S) screen, (T) sd. pr., (W) shored, (X) X other 0

Method: (A) air, (B) bored, (C) C cable, (D) dug, (H) hyd, (J) jetted, (P) P percussive, (R) rotary, (S) reverse, (T) trenching, (U) driven, (W) drive wash, (Z) other 0

Date Drilled: 1934-5 9:35 Pump intake setting: 0 ft 0

Driller: THORPE WELL CO. address DES MOINES, IA

Lift (type): (A) air, (B) bucket, (C) cent, (D) jet, (E) multiple, (F) multiple, (G) none, (H) piston, (I) rot, (J) submerg, (K) turb, (L) other D Deep D Shallow 0

Power (type): 0 diesel, ch-c, gas, gasoline, hand, gas, wind; H.P. 0 Trans. or meter no. 0

Descrip. MP LSD ft above 0 below 0 lsd, Alt. MP 1297

Alt. LSD: 1297 1297 Accuracy: (source) ALTIMETER 7

Water Level 515 ft above 0 below 0 MP; Ft 515 lsd Accuracy: REPORTED 6

Date meas: 1935 35 Yield: 10 gpm 10 Method determined 0

Drawdown: 33 ft 33 Accuracy: 0 Pumping period 0 hrs 0

QUALITY OF WATER DATA: Iron 0.20 2 Sulfate 2519.0 9 Chloride 690.0 5 Hard. 1371 9

Sp. Conduct 0 K x 10 0 Temp. 0 Date sampled JULY 4, 35 735

Taste, color, etc. 0

070-32W-08 b d d b b

Well Number 40 52 41 ^N 094 33, 25

HYDROGEOLOGIC CARD

SAME AS ON MASTER CARD Physiographic Province: CENTRAL LOWLAND ¹ ² Section: DIVIDEDTILL PLAIN ¹⁹ ²⁰ ²¹ Basin: PLATE ²² Subbasin: ²⁴Topo of ²² (D) (F) (H) (S) (T) (V) well site: local depression, flat surface, hillock, hillside, terrace, valley flat, UPLAND ²⁷ ^HMAJOR AQUIFER: MISSISSIPPIAN, LOWER ²⁸ ²⁹ M.I. HAMPTON FM. ³⁰ ³¹ K.H. system series aquifer, formation, groupLithology: DOLOMITE ³² ³³ D ³⁴ Origin: MARINE ³⁵ ³⁶ 6 ³⁷ ³⁸ Aquifer Thickness: 38 ft³⁹ ⁴⁰ 3 ⁴¹ ⁴² 8 Length of well open to: 38 ft ⁴³ ⁴⁴ 3 ⁴⁵ ⁴⁶ 8 Depth to top of: 1699 ft ⁴⁷ ⁴⁸ A ⁴⁹ ⁵⁰ 7 ⁵¹ ⁵² 0MINOR AQUIFER: MISSISSIPPIAN MIDDLE ⁵³ ⁵⁴ M.2 KEOKUK-BURLINGTON ⁵⁵ ⁵⁶ aquifer, formation, groupLithology: COARSE LS. ⁵⁷ ⁵⁸ 9 ⁵⁹ ⁶⁰ V ⁶¹ ⁶² 6 ⁶³ ⁶⁴ 6 ⁶⁵ ⁶⁶ 196 ⁶⁷ ⁶⁸ ft⁶⁹ ⁷⁰ 1 ⁷¹ ⁷² 5 ⁷³ ⁷⁴ 6 Length of well open to: 188 ft ⁷⁵ ⁷⁶ 1 ⁷⁷ ⁷⁸ 8 ⁷⁹ ⁸⁰ 8 Depth to top of: 1504 ft ⁸¹ ⁸² A ⁸³ ⁸⁴ 5 ⁸⁵ ⁸⁶ 0

Intervals

Screened:

Depth to consolidated rock: 274 ft ⁸⁷ ⁸⁸ 2 ⁸⁹ ⁹⁰ 7 ⁹¹ ⁹² 4 Source of data: WELL CUTTINGS ⁹³ ⁹⁴ CDepth to ⁹⁵ ⁹⁶ ⁹⁷ ⁹⁸ ⁹⁹ ¹⁰⁰ ¹⁰¹ ¹⁰² ¹⁰³ ¹⁰⁴ ¹⁰⁵ ¹⁰⁶ ¹⁰⁷ ¹⁰⁸ ¹⁰⁹ ¹¹⁰ ¹¹¹ ¹¹² ¹¹³ ¹¹⁴ ¹¹⁵ ¹¹⁶ ¹¹⁷ ¹¹⁸ ¹¹⁹ ¹²⁰ ¹²¹ ¹²² ¹²³ ¹²⁴ ¹²⁵ ¹²⁶ ¹²⁷ ¹²⁸ ¹²⁹ ¹³⁰ ¹³¹ ¹³² ¹³³ ¹³⁴ ¹³⁵ ¹³⁶ ¹³⁷ ¹³⁸ ¹³⁹ ¹⁴⁰ ¹⁴¹ ¹⁴² ¹⁴³ ¹⁴⁴ ¹⁴⁵ ¹⁴⁶ ¹⁴⁷ ¹⁴⁸ ¹⁴⁹ ¹⁵⁰ ¹⁵¹ ¹⁵² ¹⁵³ ¹⁵⁴ ¹⁵⁵ ¹⁵⁶ ¹⁵⁷ ¹⁵⁸ ¹⁵⁹ ¹⁶⁰ ¹⁶¹ ¹⁶² ¹⁶³ ¹⁶⁴ ¹⁶⁵ ¹⁶⁶ ¹⁶⁷ ¹⁶⁸ ¹⁶⁹ ¹⁷⁰ ¹⁷¹ ¹⁷² ¹⁷³ ¹⁷⁴ ¹⁷⁵ ¹⁷⁶ ¹⁷⁷ ¹⁷⁸ ¹⁷⁹ ¹⁸⁰ ¹⁸¹ ¹⁸² ¹⁸³ ¹⁸⁴ ¹⁸⁵ ¹⁸⁶ ¹⁸⁷ ¹⁸⁸ ¹⁸⁹ ¹⁹⁰ ¹⁹¹ ¹⁹² ¹⁹³ ¹⁹⁴ ¹⁹⁵ ¹⁹⁶ ¹⁹⁷ ¹⁹⁸ ¹⁹⁹ ²⁰⁰ ²⁰¹ ²⁰² ²⁰³ ²⁰⁴ ²⁰⁵ ²⁰⁶ ²⁰⁷ ²⁰⁸ ²⁰⁹ ²¹⁰ ²¹¹ ²¹² ²¹³ ²¹⁴ ²¹⁵ ²¹⁶ ²¹⁷ ²¹⁸ ²¹⁹ ²²⁰ ²²¹ ²²² ²²³ ²²⁴ ²²⁵ ²²⁶ ²²⁷ ²²⁸ ²²⁹ ²³⁰ ²³¹ ²³² ²³³ ²³⁴ ²³⁵ ²³⁶ ²³⁷ ²³⁸ ²³⁹ ²⁴⁰ ²⁴¹ ²⁴² ²⁴³ ²⁴⁴ ²⁴⁵ ²⁴⁶ ²⁴⁷ ²⁴⁸ ²⁴⁹ ²⁵⁰ ²⁵¹ ²⁵² ²⁵³ ²⁵⁴ ²⁵⁵ ²⁵⁶ ²⁵⁷ ²⁵⁸ ²⁵⁹ ²⁶⁰ ²⁶¹ ²⁶² ²⁶³ ²⁶⁴ ²⁶⁵ ²⁶⁶ ²⁶⁷ ²⁶⁸ ²⁶⁹ ²⁷⁰ ²⁷¹ ²⁷² ²⁷³ ²⁷⁴ ²⁷⁵ ²⁷⁶ ²⁷⁷ ²⁷⁸ ²⁷⁹ ²⁸⁰ ²⁸¹ ²⁸² ²⁸³ ²⁸⁴ ²⁸⁵ ²⁸⁶ ²⁸⁷ ²⁸⁸ ²⁸⁹ ²⁹⁰ ²⁹¹ ²⁹² ²⁹³ ²⁹⁴ ²⁹⁵ ²⁹⁶ ²⁹⁷ ²⁹⁸ ²⁹⁹ ³⁰⁰ ³⁰¹ ³⁰² ³⁰³ ³⁰⁴ ³⁰⁵ ³⁰⁶ ³⁰⁷ ³⁰⁸ ³⁰⁹ ³¹⁰ ³¹¹ ³¹² ³¹³ ³¹⁴ ³¹⁵ ³¹⁶ ³¹⁷ ³¹⁸ ³¹⁹ ³²⁰ ³²¹ ³²² ³²³ ³²⁴ ³²⁵ ³²⁶ ³²⁷ ³²⁸ ³²⁹ ³³⁰ ³³¹ ³³² ³³³ ³³⁴ ³³⁵ ³³⁶ ³³⁷ ³³⁸ ³³⁹ ³⁴⁰ ³⁴¹ ³⁴² ³⁴³ ³⁴⁴ ³⁴⁵ ³⁴⁶ ³⁴⁷ ³⁴⁸ ³⁴⁹ ³⁵⁰ ³⁵¹ ³⁵² ³⁵³ ³⁵⁴ ³⁵⁵ ³⁵⁶ ³⁵⁷ ³⁵⁸ ³⁵⁹ ³⁶⁰ ³⁶¹ ³⁶² ³⁶³ ³⁶⁴ ³⁶⁵ ³⁶⁶ ³⁶⁷ ³⁶⁸ ³⁶⁹ ³⁷⁰ ³⁷¹ ³⁷² ³⁷³ ³⁷⁴ ³⁷⁵ ³⁷⁶ ³⁷⁷ ³⁷⁸ ³⁷⁹ ³⁸⁰ ³⁸¹ ³⁸² ³⁸³ ³⁸⁴ ³⁸⁵ ³⁸⁶ ³⁸⁷ ³⁸⁸ ³⁸⁹ ³⁹⁰ ³⁹¹ ³⁹² ³⁹³ ³⁹⁴ ³⁹⁵ ³⁹⁶ ³⁹⁷ ³⁹⁸ ³⁹⁹ ⁴⁰⁰ ⁴⁰¹ ⁴⁰² ⁴⁰³ ⁴⁰⁴ ⁴⁰⁵ ⁴⁰⁶ ⁴⁰⁷ ⁴⁰⁸ ⁴⁰⁹ ⁴¹⁰ ⁴¹¹ ⁴¹² ⁴¹³ ⁴¹⁴ ⁴¹⁵ ⁴¹⁶ ⁴¹⁷ ⁴¹⁸ ⁴¹⁹ ⁴²⁰ ⁴²¹ ⁴²² ⁴²³ ⁴²⁴ ⁴²⁵ ⁴²⁶ ⁴²⁷ ⁴²⁸ ⁴²⁹ ⁴³⁰ ⁴³¹ ⁴³² ⁴³³ ⁴³⁴ ⁴³⁵ ⁴³⁶ ⁴³⁷ ⁴³⁸ ⁴³⁹ ⁴⁴⁰ ⁴⁴¹ ⁴⁴² ⁴⁴³ ⁴⁴⁴ ⁴⁴⁵ ⁴⁴⁶ ⁴⁴⁷ ⁴⁴⁸ ⁴⁴⁹ ⁴⁵⁰ ⁴⁵¹ ⁴⁵² ⁴⁵³ ⁴⁵⁴ ⁴⁵⁵ ⁴⁵⁶ ⁴⁵⁷ ⁴⁵⁸ ⁴⁵⁹ ⁴⁶⁰ ⁴⁶¹ ⁴⁶² ⁴⁶³ ⁴⁶⁴ ⁴⁶⁵ ⁴⁶⁶ ⁴⁶⁷ ⁴⁶⁸ ⁴⁶⁹ ⁴⁷⁰ ⁴⁷¹ ⁴⁷² ⁴⁷³ ⁴⁷⁴ ⁴⁷⁵ ⁴⁷⁶ ⁴⁷⁷ ⁴⁷⁸ ⁴⁷⁹ ⁴⁸⁰ ⁴⁸¹ ⁴⁸² ⁴⁸³ ⁴⁸⁴ ⁴⁸⁵ ⁴⁸⁶ ⁴⁸⁷ ⁴⁸⁸ ⁴⁸⁹ ⁴⁹⁰ ⁴⁹¹ ⁴⁹² ⁴⁹³ ⁴⁹⁴ ⁴⁹⁵ ⁴⁹⁶ ⁴⁹⁷ ⁴⁹⁸ ⁴⁹⁹ ⁵⁰⁰ ⁵⁰¹ ⁵⁰² ⁵⁰³ ⁵⁰⁴ ⁵⁰⁵ ⁵⁰⁶ ⁵⁰⁷ ⁵⁰⁸ ⁵⁰⁹ ⁵¹⁰ ⁵¹¹ ⁵¹² ⁵¹³ ⁵¹⁴ ⁵¹⁵ ⁵¹⁶ ⁵¹⁷ ⁵¹⁸ ⁵¹⁹ ⁵²⁰ ⁵²¹ ⁵²² ⁵²³ ⁵²⁴ ⁵²⁵ ⁵²⁶ ⁵²⁷ ⁵²⁸ ⁵²⁹ ⁵³⁰ ⁵³¹ ⁵³² ⁵³³ ⁵³⁴ ⁵³⁵ ⁵³⁶ ⁵³⁷ ⁵³⁸ ⁵³⁹ ⁵⁴⁰ ⁵⁴¹ ⁵⁴² ⁵⁴³ ⁵⁴⁴ ⁵⁴⁵ ⁵⁴⁶ ⁵⁴⁷ ⁵⁴⁸ ⁵⁴⁹ ⁵⁵⁰ ⁵⁵¹ ⁵⁵² ⁵⁵³ ⁵⁵⁴ ⁵⁵⁵ ⁵⁵⁶ ⁵⁵⁷ ⁵⁵⁸ ⁵⁵⁹ ⁵⁶⁰ ⁵⁶¹ ⁵⁶² ⁵⁶³ ⁵⁶⁴ ⁵⁶⁵ ⁵⁶⁶ ⁵⁶⁷ ⁵⁶⁸ ⁵⁶⁹ ⁵⁷⁰ ⁵⁷¹ ⁵⁷² ⁵⁷³ ⁵⁷⁴ ⁵⁷⁵ ⁵⁷⁶ ⁵⁷⁷ ⁵⁷⁸ ⁵⁷⁹ ⁵⁸⁰ ⁵⁸¹ ⁵⁸² ⁵⁸³ ⁵⁸⁴ ⁵⁸⁵ ⁵⁸⁶ ⁵⁸⁷ ⁵⁸⁸ ⁵⁸⁹ ⁵⁹⁰ ⁵⁹¹ ⁵⁹² ⁵⁹³ ⁵⁹⁴ ⁵⁹⁵ ⁵⁹⁶ ⁵⁹⁷ ⁵⁹⁸ ⁵⁹⁹ ⁶⁰⁰ ⁶⁰¹ ⁶⁰² ⁶⁰³ ⁶⁰⁴ ⁶⁰⁵ ⁶⁰⁶ ⁶⁰⁷ ⁶⁰⁸ ⁶⁰⁹ ⁶¹⁰ ⁶¹¹ ⁶¹² ⁶¹³ ⁶¹⁴ ⁶¹⁵ ⁶¹⁶ ⁶¹⁷ ⁶¹⁸ ⁶¹⁹ ⁶²⁰ ⁶²¹ ⁶²² ⁶²³ ⁶²⁴ ⁶²⁵ ⁶²⁶ ⁶²⁷ ⁶²⁸ ⁶²⁹ ⁶³⁰ ⁶³¹ ⁶³² ⁶³³ ⁶³⁴ ⁶³⁵ ⁶³⁶ ⁶³⁷ ⁶³⁸ ⁶³⁹ ⁶⁴⁰ ⁶⁴¹ ⁶⁴² ⁶⁴³ ⁶⁴⁴ ⁶⁴⁵ ⁶⁴⁶ ⁶⁴⁷ ⁶⁴⁸ ⁶⁴⁹ ⁶⁵⁰ ⁶⁵¹ ⁶⁵² ⁶⁵³ ⁶⁵⁴ ⁶⁵⁵ ⁶⁵⁶ ⁶⁵⁷ ⁶⁵⁸ ⁶⁵⁹ ⁶⁶⁰ ⁶⁶¹ ⁶⁶² ⁶⁶³ ⁶⁶⁴ ⁶⁶⁵ ⁶⁶⁶ ⁶⁶⁷ ⁶⁶⁸ ⁶⁶⁹ ⁶⁷⁰ ⁶⁷¹ ⁶⁷² ⁶⁷³ ⁶⁷⁴ ⁶⁷⁵ ⁶⁷⁶ ⁶⁷⁷ ⁶⁷⁸ ⁶⁷⁹ ⁶⁸⁰ ⁶⁸¹ ⁶⁸² ⁶⁸³ ⁶⁸⁴ ⁶⁸⁵ ⁶⁸⁶ ⁶⁸⁷ ⁶⁸⁸ ⁶⁸⁹ ⁶⁹⁰ ⁶⁹¹ ⁶⁹² ⁶⁹³ ⁶⁹⁴ ⁶⁹⁵ ⁶⁹⁶ ⁶⁹⁷ ⁶⁹⁸ ⁶⁹⁹ ⁷⁰⁰ ⁷⁰¹ ⁷⁰² ⁷⁰³ ⁷⁰⁴ ⁷⁰⁵ ⁷⁰⁶ ⁷⁰⁷ ⁷⁰⁸ ⁷⁰⁹ ⁷¹⁰ ⁷¹¹ ⁷¹² ⁷¹³ ⁷¹⁴ ⁷¹⁵ ⁷¹⁶ ⁷¹⁷ ⁷¹⁸ ⁷¹⁹ ⁷²⁰ ⁷²¹ ⁷²² ⁷²³ ⁷²⁴ ⁷²⁵ ⁷²⁶ ⁷²⁷ ⁷²⁸ ⁷²⁹ ⁷³⁰ ⁷³¹ ⁷³² ⁷³³ ⁷³⁴ ⁷³⁵ ⁷³⁶ ⁷³⁷ ⁷³⁸ ⁷³⁹ ⁷⁴⁰ ⁷⁴¹ ⁷⁴² ⁷⁴³ ⁷⁴⁴ ⁷⁴⁵ ⁷⁴⁶ ⁷⁴⁷ ⁷⁴⁸ ⁷⁴⁹ ⁷⁵⁰ ⁷⁵¹ ⁷⁵² ⁷⁵³ ⁷⁵⁴ ⁷⁵⁵ ⁷⁵⁶ ⁷⁵⁷ ⁷⁵⁸ ⁷⁵⁹ ⁷⁶⁰ ⁷⁶¹ ⁷⁶² ⁷⁶³ ⁷⁶⁴ ⁷⁶⁵ ⁷⁶⁶ ⁷⁶⁷ ⁷⁶⁸ ⁷⁶⁹ ⁷⁷⁰ ⁷⁷¹ ⁷⁷² ⁷⁷³ ⁷⁷⁴ ⁷⁷⁵ ⁷⁷⁶ ⁷⁷⁷ ⁷⁷⁸ ⁷⁷⁹ ⁷⁸⁰ ⁷⁸¹ ⁷⁸² ⁷⁸³ ⁷⁸⁴ ⁷⁸⁵ ⁷⁸⁶ ⁷⁸⁷ ⁷⁸⁸ ⁷⁸⁹ ⁷⁹⁰ ⁷⁹¹ ⁷⁹² ⁷⁹³ ⁷⁹⁴ ⁷⁹⁵ ⁷⁹⁶ ⁷⁹⁷ ⁷⁹⁸ ⁷⁹⁹ ⁸⁰⁰ ⁸⁰¹ ⁸⁰² ⁸⁰³ ⁸⁰⁴ ⁸⁰⁵ ⁸⁰⁶ ⁸⁰⁷ ⁸⁰⁸ ⁸⁰⁹ ⁸¹⁰ ⁸¹¹ ⁸¹² ⁸¹³ ⁸¹⁴ ⁸¹⁵ ⁸¹⁶ ⁸¹⁷ ⁸¹⁸ ⁸¹⁹ ⁸²⁰ ⁸²¹ ⁸²² ⁸²³ ⁸²⁴ ⁸²⁵ ⁸²⁶ ⁸²⁷ ⁸²⁸ ⁸²⁹ ⁸³⁰ ⁸³¹ ⁸³² ⁸³³ ⁸³⁴ ⁸³⁵ ⁸³⁶ ⁸³⁷ ⁸³⁸ ⁸³⁹ ⁸⁴⁰ ⁸⁴¹ ⁸⁴² ⁸⁴³ ⁸⁴⁴ ⁸⁴⁵ ⁸⁴⁶ ⁸⁴⁷ ⁸⁴⁸ ⁸⁴⁹ ⁸⁵⁰ ⁸⁵¹ ⁸⁵² ⁸⁵³ ⁸⁵⁴ ⁸⁵⁵ ⁸⁵⁶ ⁸⁵⁷ ⁸⁵⁸ ⁸⁵⁹ ⁸⁶⁰ ⁸⁶¹ ⁸⁶² ⁸⁶³ ⁸⁶⁴ ⁸⁶⁵ ⁸⁶⁶ ⁸⁶⁷ ⁸⁶⁸ ⁸⁶⁹ ⁸⁷⁰ ⁸⁷¹ ⁸⁷² ⁸⁷³ ⁸⁷⁴ ⁸⁷⁵ ⁸⁷⁶ ⁸⁷⁷ ⁸⁷⁸ ⁸⁷⁹ ⁸⁸⁰ ⁸⁸¹ ⁸⁸² ⁸⁸³ ⁸⁸⁴ ⁸⁸⁵ ⁸⁸⁶ ⁸⁸⁷ ⁸⁸⁸ ⁸⁸⁹ ⁸⁹⁰ ⁸⁹¹ ⁸⁹² ⁸⁹³ ⁸⁹⁴ ⁸⁹⁵ ⁸⁹⁶ ⁸⁹⁷ ⁸⁹⁸ ⁸⁹⁹ ⁹⁰⁰ ⁹⁰¹ ⁹⁰² ⁹⁰³ ⁹⁰⁴ ⁹⁰⁵ ⁹⁰⁶ ⁹⁰⁷ ⁹⁰⁸ ⁹⁰⁹ ⁹¹⁰ ⁹¹¹ ⁹¹² ⁹¹³ ⁹¹⁴ ⁹¹⁵ ⁹¹⁶ ⁹¹⁷ ⁹¹⁸ ⁹¹⁹ ⁹²⁰ ⁹²¹ ⁹²² ⁹²³ ⁹²⁴ ⁹²⁵ ⁹²⁶ ⁹²⁷ ⁹²⁸ ⁹²⁹ ⁹³⁰ ⁹³¹ ⁹³² ⁹³³ ⁹³⁴ ⁹³⁵ ⁹³⁶ ⁹³⁷ ⁹³⁸ ⁹³⁹ ⁹⁴⁰ ⁹⁴¹ ⁹⁴² ⁹⁴³ ⁹⁴⁴ ⁹⁴⁵ ⁹⁴⁶ ⁹⁴⁷ ⁹⁴⁸ ⁹⁴⁹ ⁹⁵⁰ ⁹⁵¹ ⁹⁵² ⁹⁵³ ⁹⁵⁴ ⁹⁵⁵ ⁹⁵⁶ ⁹⁵⁷ ⁹⁵⁸ ⁹⁵⁹ ⁹⁶⁰ ⁹⁶¹ ⁹⁶² ⁹⁶³ ⁹⁶⁴ ⁹⁶⁵ ⁹⁶⁶ ⁹⁶⁷ ⁹⁶⁸ ⁹⁶⁹ ⁹⁷⁰ ⁹⁷¹ ⁹⁷² ⁹⁷³ ⁹⁷⁴ ⁹⁷⁵ ⁹⁷⁶ ⁹⁷⁷ ⁹⁷⁸ ⁹⁷⁹ ⁹⁸⁰ ⁹⁸¹ ⁹⁸² ⁹⁸³ ⁹⁸⁴ ⁹⁸⁵ ⁹⁸⁶ ⁹⁸⁷ ⁹⁸⁸ ⁹⁸⁹ ⁹⁹⁰ ⁹⁹¹ ⁹⁹² ⁹⁹³ ⁹⁹⁴ ⁹⁹⁵ ⁹⁹⁶ ⁹⁹⁷ ⁹⁹⁸ ⁹⁹⁹ ¹⁰⁰⁰

W0017

750-755 Very hard drilling

738-743 - hit coal - no cap rock

473-475 - Coal traces from that
dumped in at 470.470-473 coal dumped in hole to
mix up this shale

385-392 Saltwater

2455-2465 Unable to catch cuttings
at 2460 (see over)

- 2307-2323 Unable to catch cuttings for 15'
- 1994-1996 Steel line connection
- 2875-2879 Shale caving in from above
- 2866-2873 Shale is caving
- 3390 no cuttings - chips of rock
- 3394 bailings with sand pump - no cuttings
- 3965 no gap between 3965 & 4006
- 4164 1 1/2 ft sand next shale
- 4416 sandy shale
- 5055 Caving of wall after standing 1 mo.
- 4936-41 some chucks white shale did not
cut for time.

DRILLER'S NOTEBOOK

WELL RECORD

Driller Thorpe Well Co

Address Des Moines Iowa

W-0117

Farm or Town Lenox

Owner IERA

RETURN TO
IOWA GEOLOGICAL SURVEY
Des Moines, Iowa

SUGGESTIONS TO DRILLERS.

1. Samples should be taken from each bed passed through, and never more than 10 feet apart, even in the same bed.
 2. Samples should not be washed, as washed samples give a wrong idea of the character of the bed.
 3. Sacks will be furnished by the Survey.
 4. All oyster, clam, or other fossil shells should be placed in the bags with the material in which they are found, and marked with the depth from which obtained.
 5. Fill out the label on each bag.
 6. Note depth and thickness of all water-bearing layers.
 7. Note the quality of the water from each layer: As hard, soft, salty, alkaline, or sulphur bearing.
 8. Note height to which water from each layer rises in well, and give flow in gallons per minute.
 9. Make frequent use of the "Description" column to explain your notes.
 10. If you do not understand what is wanted, or desire information on any point, write to this office.
 11. Sacks may be boxed and sent to IOWA GEOLOGICAL SURVEY, DES MOINES, IOWA, by express collect.
- The Survey desires to assist and cooperate with owners and drillers in every way possible, and will be glad to answer questions.

WELL RECORD.

Well is located _____ miles in a Lenox direction
 from _____ in _____, in the
(Post office.) (State.)

_____ $\frac{1}{4}$ _____ $\frac{1}{4}$ sec. _____ T. _____ R. _____

Owner, I.E.R.A.

Address, Oransky Building, Des Moines Ia

Contractor, Thorppe Well Co

Address, Des Moines Ia

Well begun Dec., 1929; completed _____, 192

Rig used—cable, rotary, jet, or _____

Maker, Thorppe

Diameter of well at mouth, 16" OD; at bottom, _____
(Inches.) (Inches.)

Depth of well, _____; Length and size of casing, _____
(Feet.)

Water at _____ ft.
(Depths in feet.)

Main supply at _____ ft.

Water head _____ ft.

Is well pumped? _____; Yield, _____
(Gallons per minute.)

Recorded by N. C. Georgesen

Address, Lenox Iowa

Sample No.	DEPTH		THICKNESS	DESCRIPTION OF BEDS
	From	To		KIND OF ROCK, COLOR, HARD OR SOFT WATER, ETC.
	0	10	10	Soil mixed with Loess
1.	10	15	5	Loess, Light brown to buff
2	15	20	5	Loess; Less oxidation, buff to dull gray, smooth texture
3	20	25	5	Loess; slightly darker than 15-20
4	25	28	3	Loess & K-g-til mixed, sticky Lighter color than 20-25
5	28	33	5	G-til, Kansan, Light gray, sticky Typical
6	33	36	3	some G-til, Mostly, oxidized, and showing some reaction with HCl
7	36	40	4	Till, K, unk & ox, very little
8	40	45	5	" " " " " Typical Hanson Till
9	45	49	4	Till, Kan, Some unoxidized, unleached.
10	49	52	3	Till Kan, about same as 45-49. Little more unoxidized
11	52	56	4	Till, Kan, still ox. unleached. Sandy
12	56	63	7	Till, Kan, some unox. unleached Sandy, Few pebbles
13	63	66	3	Till, Kan. Small specks blue (unox) still largely oxidized

Sample No.	DEPTH		THICKNESS	DESCRIPTION OF BEDS
	From	To		KIND OF ROCK, COLOR, HARD OR SOFT WATER, ETC.
14	66	68	2	Till, Kansan, unleached, oxidized considerable gravel, little sand
15	68	72	4	Till, Kansan, beginning to show unoxidation, buff to olive green, less gravel
16	72	74	2	Till, Kansan, getting more bluish green. Some gravel, little water
17	74	77	3	Till, Kansan, unleached, nearly all unoxidized, sandy material mostly med
18	77	83	6	Till, Kansan, unox, unleached, same sd
19	83	87	4	Till, Kansan, unL & unox, some sand & gravel
20	87	91	4	Till and, probably Neb-G-til, little or no. HCl reaction, but low in colloidal material material came in at about 90 ft
21	91	93	2	G-til, Neb, top about 90' very dense mixes very slowly, med gray.
22	93	95	2	G-til, Neb, dense, mixes slowly low in colloidal material, trace of oxid ^{ation}
23	95	99	4	G-til & Till, shows some HCl reaction bottom of G-til about 97 ft, some oxidation
24	99	101	2	Till, Neb, unL & ox, yellowish-green more sticky than Kan.
25	101	105	4	Till, Neb unL & ox, Tan to L brown some bluish green, mixes slowly
26	105	108	3	Till, Neb unL & ox, reddish brown some sd & Gr
27	108	110	2	Till, about same as 105-108
28	110	113	3	Till, still, uniform

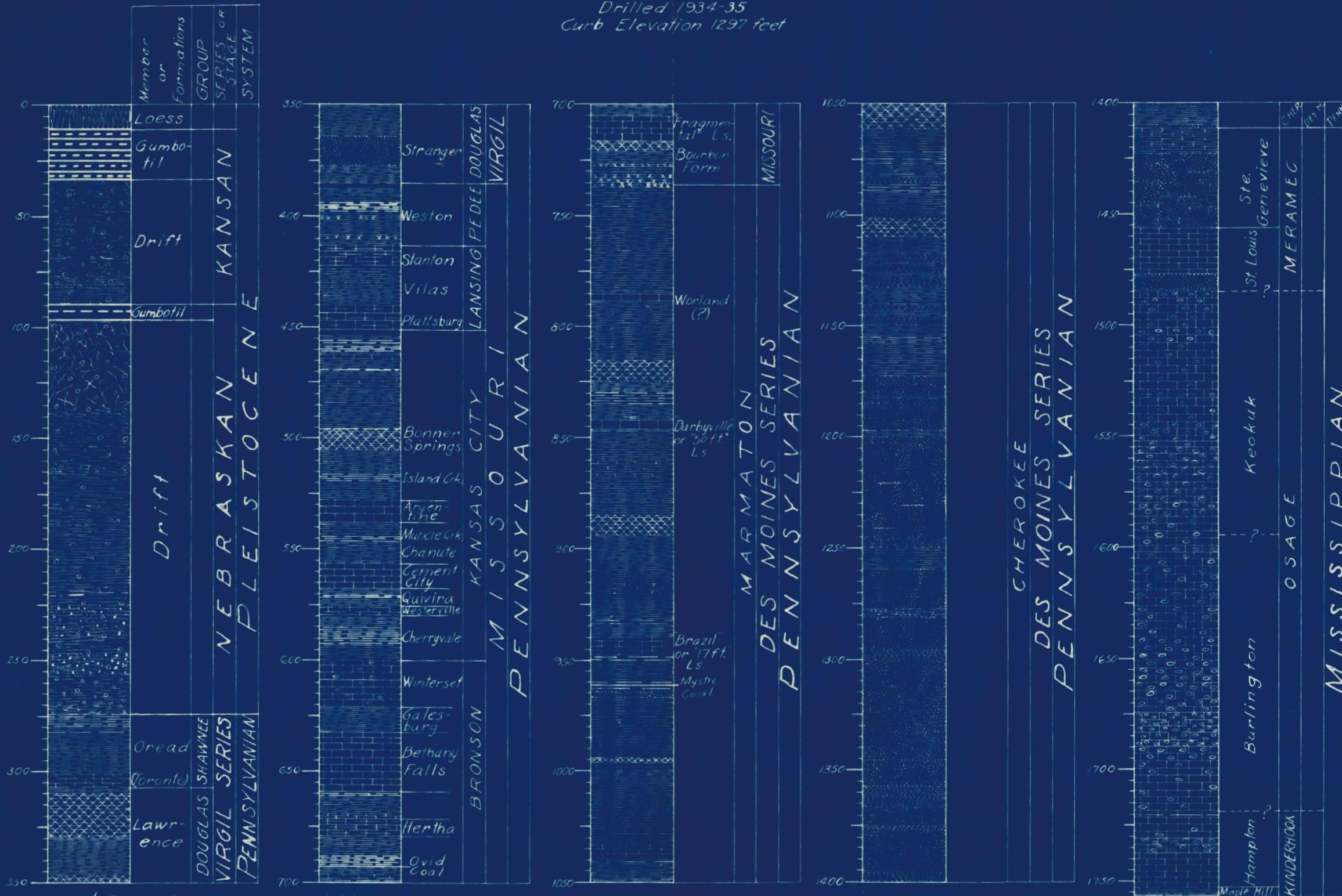
Sample No.	DEPTH		THICKNESS	DESCRIPTION OF BEDS
	From	To		KIND OF ROCK, COLOR, HARD OR SOFT WATER, ETC.
29	113	115½	2½	Till, Neb reddish tan to brown some sand, un ^{der} 4 ox
30	115½	119	3½	Till, Neb, still ox, Buff to L Brown, little water, bails down redly
31	119	124	5	Till, Neb, oxidized, Buff to L brown,
32	124	128	4	Till, Neb, oxidized, about same as 119-124
33	128	132	4	Till, Neb, Nearly all oxidized, few unoxidized streaks,
34	132	135	3	Till, Neb about same as 128-132 section in ox, Neb running very uniform
35	135	138	3	Till, Neb, still uniform except for few large cobbles
36	138	140	2	Till, Neb, about same as 135-138 still oxidized
37	140	143	3	Till, Neb, about as 138-140
38	143	144	1	" " " " " "
39	144	147	3	Till, Neb oxidized, about same as 143-144
40	147	150	3	" " " " " "
41	150	154	4	Till, Neb, showing some blue dense shaly massive material. <small>may be dense massive till</small> Massive blue material Labeled on bag as 153-154

Sample No.	DEPTH		THICKNESS	DESCRIPTION OF BEDS
	From	To		KIND OF ROCK, COLOR, HARD OR SOFT WATER, ETC.
42	154	155	1	Till, Neb, blue shaley clay at 153-154 Probably, boulder within the till, still mostly ^{OX till}
43	155	157	2	Till, Neb, buff to light brown about same as foregoing.
44 → 6 PM, Dec 13	157	162	5	About same as 155-157, still oxidized
45	162	165	3	Till, Neb, buff, oxidized
46	165	168	3	Till, Neb, Mixed OX & Un ox some dark blue shows up at about 167.
47 Tower	168	169	1	Till Neb Nearly all Fresh Un ox & Un ox
48	169	172	3	Till, Neb, Fresh, dark blue gray very sticky for fresh till
49	172	175	3	About same as 169-172
50 → Dec 14, 6 PM	175	178	3	Till, Neb, Fresh, dark gray to blue seems to be becoming more sticky, slow ^{Mixing}
51	178	180	2	Till, Neb, Fresh, dark gray, containing many Ls pebbles but these are well rounded ^{in some cases}
52	180	183	3	Till, Neb, Fresh but Less Ls pebbles brown mottles resembling carbonaceous matter ⁱⁿ
53	183	186	3	Till, Neb, Fresh, Dark blue, Less pebbles, very tenacious. Mixes slowly
54	186	190	4	About same as 183-186. Possibly fewer pebbles & slightly denser
55 Dec 18, 6 PM	190	195	5	Till, Neb, Fresh, some pebbles. dark gray to blue

Sample No.	DEPTH		THICKNESS	DESCRIPTION OF BEDS
	From	To		KIND OF ROCK, COLOR, HARD OR SOFT WATER, ETC.
56	195	197	2	Till, Neb, some pebbles, Fresh, Dark blue, to Gray. Mixes slowly.
57	197	200	3	Till, about same as 195-197
58	200	204	4	" " " " " "
59	204	206	2	" " " " " " dense becoming little lighter gray, little less
60	206	208	2	Till, Neb, Dark gray. Some pebbles. Considerable ls pebbles
61	208	211	3	Till, Neb, More pebbles. Dup sample. Massive arenaceous shale, very similar to Dup shown at 150-154. Possibly contamination from that horizon. Probably a piece of shale incorporated in the till.
61 Hole measured with steel tape				
Depth 211 ft to derrick floor				
Ground surface 2 ft below derrick floor, actual depth of drilled hole 209'				

LENOX, IOWA WELL LOG

Drilled 1934-35
Curb Elevation 1297 feet



LEGEND

- Loess
- Gumbotil
- Leached & Oxidized Drift
- Oxidized & Unleached Drift
- Unoxidized & Unleached Drift
- Coarse sand or Gravel
- Siltstone
- Shale, gray and green
- Shale, black
- Coal
- Shale, red
- Limestone
- Limestone, shaly
- Limestone, cherty
- Sandstone
- Depth Correction

Interpretation based on Binocular Study and Insoluble Residues of Cable Tool Cuttings at intervals of 5 feet or less.

Vertical Scale: 1 in. = 50 ft.

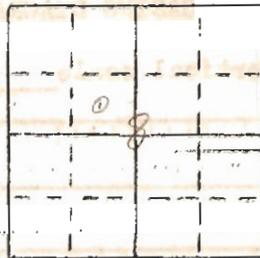
A.C. Tester
Iowa Geological Survey

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

W-0117

RECORD OF WELL

Location:



Town: Lenox (N E)
(S W): County Taylor

C-SE-NW sec. 8 T 70 N., R. 32 W. Twp.

Well name and number CITY Well IERA

Owner _____ Address _____

Tenant _____ Address _____

Contractor Thorp Well Co Address Des Moines

Drillers _____

Drilling dates 1934-35

Well data:

Elevations: Drilling curb 1297 feet; Land surface _____ feet

Determined by _____

Topographic position Upland - tabular Divide

Total depth: Reported _____ feet; Measured 1757.3' feet

Drilling method cable

Hole and casing data steel casing 10 3/4" to 1024' 3", 8 5/8" surface to 1512.7"

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

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

Sources of water: Principal _____ ; Others _____

Production data: _____ Date _____

Static depth to water 575 Measuring point 7500 ft. below surface
Pumping level 548 at _____ g.p.m.

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

Pump data: Type pump _____ Column Dia. _____ Length _____
Cylinder or bowls: Dia. _____ Length _____ Suction pipe _____

Power _____ Airline _____

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

Use of water _____

WATER ANALYSES (in parts per million)

Date samples	<u>June 14, 1935</u>	_____	_____
Sampled by	<u>A.C. Tarter</u>	_____	_____
Total solids	<u>519.5</u>	_____	_____
Insoluble matter	<u>29.0</u>	_____	_____
Alkalinity (Meo)	<u>356</u>	_____	_____
Alkalinity (Phn)	_____	_____	_____
pH	<u>7.1</u>	_____	_____
Fe ₂ O ₃ + Mn ₂ O ₃ + Al ₂ O ₃	<u>9.2</u>	_____	_____
Alkali as sodium	<u>1113.2</u>	_____	_____
Calcium	<u>441.4</u>	_____	_____
Magnesium	<u>65.4</u>	_____	_____
Iron (unfiltered)	<u>0.20</u>	_____	_____
Manganese	<u>0.07</u>	_____	_____
Nitrate	<u>0.0</u>	_____	_____
Fluoride	<u>2.5</u>	_____	_____
Chloride	<u>140.0</u>	_____	_____
Sulfate	<u>2514.0</u>	_____	_____
Bicarbonate	<u>434.3</u>	_____	_____
Hardness (ppm)	<u>1371</u>	_____	_____
Hardness (gpg)	<u>80.1</u>	_____	_____

Remarks _____

Laboratory data: _____ Sample storage location _____

Sample range 0-1757'3" No. spls. 717 No. dupls. & cond. 692 Good

Spls. prepared by _____ Washed range _____ by _____

Driller's log and cond. _____

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

Microscopic study Elmer Tarter strip log Elmer Tarter

Gen. log _____ Correl. by Elmer Tarter

UNITED STATES DEPARTMENT OF THE INTERIOR
Geological Survey
Water Resources Division

MKH

W-0117

Water Quality
(ppm)

Card Q

State: IOWA 1 2 County: TAYLOR 5 7 Town: LENOX

Well No. Latitude 405291N Longitude 014325 Seq. No. 1 Date M 0 D 7 Y 135

Sampling Depth 1757 Type 1 Kx10⁶ pH 71 Temp. °F

SiO₂ . Ca 441. Mg 65. Na 1110. K .C

HCO₃ 437 CO₃ SO₄ 2510. Cl 540. Source No. 3 4

Card R

Duplicate Columns 1-25 from Card Q

F 215 NO₃ .0 PO₄ .0 B . Al 415 Fe .2

Mn .07 Cu . Pb . Zn .

Determined 5200 Solids Ca, Mg 1370 Hardness Non-Carb. 1020

Color No. R

Card S

Duplicate Columns 1-25 from Card Q

Br . I . Alk. as CaCO₃ 356 Free CO₂ . SAR .

RSC . ABS . .

Alpha (pc/l) . Beta (pc/l) . Ra (pc/l) . U (ug/l) .

Verified PMJ

No. 5
80

Punched FCH

Recorded by: D. HARRISON

Punched by: _____ Date: _____

Published: _____

GEOLOGICAL REPORT ON WATER RESOURCES

AT

LENOX, IOWA

PART I

STATEMENT OF FACTS

Introduction

The town of Lenox is located in Platte township (T. 70 N., R. 32 W.) in the northeast part of Taylor County. The official census of 1930 shows a population of 1172 people living in the town.

Lenox is located on the flat divide at an elevation of about 1295 feet above sea level. The town is not located along any stream, both East and Middle One Hundred and Two rivers find their source near the town. The northernmost branch of the former stream is dammed at the upper part to form the reservoir for the present water supply of Lenox. The city water reservoir tank stands on a tower near the center of the town.

The citizens have the usual occupations of a typical Iowa town surrounded by a farming district. There are no industries of importance which are water consumers.

Under the direction of the Iowa Geological Survey this study was made by Dr. P. T. Miller who visited this area during the latter part of August and early part of September, 1934.

Normal Water Supply

The town of Lenox has in years past depended for its entire water supply on a reservoir made by two dams across a branch of the East One Hundred and Two river valley. volume XXXIII of the Iowa Geological Survey makes the following statements: The dam is built with a core of cement. At Lenox two reservoirs comparatively low dams furnish the storage that in a single reservoir would require a higher dam. The amount of storage in dry seasons of course may be much less than the total capacity of the reservoir. Thus at Lenox the maximum depth of water, 28 feet, may be drawn down in drought to 10 feet. The reservoir is formed by an earth dam 1,000 feet long and 30 feet high. It is located 1 mile north of town and has a 50,000,000 gal. capacity.

This plant has two dams, one which was built first is about 20 feet high and impounds water which covers 8 acres. The new dam built farther down the valley to such a height that the water backs up almost to the foot of the old dam impounds about $39\frac{1}{2}$ acres. The watershed for the two dams includes about 750 acres all of which are close.

The water is pumped through the treating plant to the reservoir for distribution through the water mains.

Present Water Supply

At the present time the town is taking water from their reservoir. They have pumped all of the water from the new reservoir back into the old reservoir in order that the loss may be reduced. They have had no rains and the supply is so low that most of it should be reserved for fire protection. I do not understand how they can get along much longer without hauling water.

Geology of Area

The bedrock surface is not exposed around Lenox and no wells report its depth. Three wells were drilled into the bedrock but no records are available other than their depths, 320, 340, and 600 feet. Only the 340 foot well is now producing water and it appears to have an almost inexhaustible artesian supply.

Overlying the bedrock is the Nebraskan drift which is probably about 100 to 150 feet thick at Lenox. During the Aftonian interglacial interval, gumbotil about 8 to 9 feet thick formed an impervious layer over its relatively flat surface. During the latter part of the interval much of the gumbotil was removed by erosion.

The Kansan drift overlies the Nebraskan drift and has an average thickness of about 50 feet above the surface of the Nebraskan gumbotil. It like the Nebraskan drift formed a relatively flat plain upon which a layer of gumbotil about 11 to 13 feet was formed during the

Yarmouth interglacial interval. Much of this gumbotil was removed during the latter part of the Yarmouth interval and during subsequent time before the deposition of the loess which now mantles most of the surface. This gumbotil now exists on many of the higher hills and underlies the flat tabulat divides such as that upon which Lenox stands.

Loess of Peorian and Loveland ages mantles the old eroded Kansan drift surface. In many places it is not possible at present to differentiate between the two loess deposits and for this report, differentiation would be of no practical importance. In general their combined thickness is between 5 and 20 feet. Loveland silt, sand, and gravel are abundant in the major valleys but none these valleys are closer than a mile from town.

Present Water Resources

Previous to the construction of the present water supply, Lenox received its water from shallow wells in the glacial drift. These wells were bored and dug to various depths but generally about 50 feet. The records of these wells are inaccurate and difficult to obtain. On the farms around Lenox much of the water supply still comes from such wells, many of which became dry during the past summer. In the major valleys a short distance from Lenox the wells sunk in the valleys afford a good supply of water and have not gone dry this past summer.

Deep Wells.-

Only three deep wells have been drilled in this part of the county. These were to depths of 320, 340, and 6000 feet. Only the one 340 feet deep was of any value and it is a good well. The only records of these wells are their depth and that they were in rock.

Surface Flow.-

No surface flow is available except by damming an intermittent (Middle One Hundred and Two) about one mile west of town. It however would be little better than the present reservoir.

GEOLOGICAL REPORT ON WATER RESOURCES

AT

LENOX, IOWA

PART I

STATEMENT OF FACTS

Introduction

The town of Lenox is located in Platte township (T. 70 N., R. 32 W.) in the northeast part of Taylor County. The official census of 1930 shows a population of 1172 people living in the town.

Lenox is located on the flat divide at an elevation of about 1295 feet above sea level. The town is not located along any stream, both East and Middle One Hundred and Two rivers find their source near the town. The northernmost branch of the former stream is dammed at the upper part to form the reservoir for the present water supply of Lenox. The city water reservoir tank stands on a tower near the center of the town.

The citizens have the usual occupations of a typical Iowa town surrounded by a farming district. There are no industries of importance which are water consumers.

Under the direction of the Iowa Geological Survey this study was made by Dr. P. T. Miller who visited this area during the latter part of August and early part of September, 1934.

Normal Water Supply

The town of Lenox has in years past depended for its entire water supply on a reservoir made by two dams across a branch of the East One Hundred and Two river valley. Volume XXXIII of the Iowa Geological Survey makes the following statements: The dam is built with a core of cement. At Lenox two reservoirs comparatively low dams furnish the storage that in a single reservoir would require a higher dam. The amount of storage in dry seasons of course may be much less than the total capacity of the reservoir. Thus at Lenox the maximum depth of water, 28 feet, may be drawn down in drought to 10 feet. The reservoir is formed by an earth dam 1,000 feet long and 30 feet high. It is located 1 mile north of town and has a 50,000,000 gal. capacity.

This plant has two dams, one which was built first is about 20 feet high and impounds water which covers 8 acres. The new dam built farther down the valley to such a height that the water backs up almost to the foot of the old dam impounds about $39\frac{1}{2}$ acres. The watershed for the two dams includes about 750 acres all of which are close.

The water is pumped through the treating plant to the reservoir for distribution through the water mains.

Present Water Supply

At the present time the town is taking water from their reservoir. They have pumped all of the water from the new reservoir back into the old reservoir in order that the loss may be reduced. They have had no rains and the supply is so low that most of it should be reserved for fire protection. I do not understand how they can get along much longer without hauling water.

Geology of Area

The bedrock surface is not exposed around Lenox and no wells report its depth. Three wells were drilled into the bedrock but no records are available other than their depths, 320, 340, and 600 feet. Only the 340 foot well is now producing water and it appears to have an almost inexhaustible artesian supply.

Overlying the bedrock is the Nebraskan drift which is probably about 100 to 150 feet thick at Lenox. During the Aftonian interglacial interval, gumbotil about 8 to 9 feet thick formed an impervious layer over its relatively flat surface. During the latter part of the interval much of the gumbotil was removed by erosion.

The Kansan drift overlies the Nebraskan drift and has an average thickness of about 50 feet above the surface of the Nebraskan gumbotil. It like the Nebraskan drift formed a relatively flat plain upon which a layer of gumbotil about 11 to 13 feet was formed during the

Yarmouth interglacial interval. Much of this gumbotil was removed during the latter part of the Yarmouth interval and during subsequent time before the deposition of the loess which now mantles most of the surface. This gumbotil now exists on many of the higher hills and underlies the flat tabular divides such as that upon which Lenox stands.

Loess of Peorian and Loveland ages mantles the old eroded Kansan drift surface. In many places it is not possible at present to differentiate between the two loess deposits and for this report, differentiation would be of no practical importance. In general their combined thickness is between 5 and 20 feet. Loveland silt, sand, and gravel are abundant in the major valleys but none these valleys are closer than a mile from town.

Present Water Resources

Previous to the construction of the present water supply, Lenox received its water from shallow wells in the glacial drift. These wells were bored and dug to various depths but generally about 50 feet. The records of these wells are inaccurate and difficult to obtain. On the farms around Lenox much of the water supply still comes from such wells, many of which became dry during the past summer. In the major valleys a short distance from Lenox the wells sunk in the valleys afford a good supply of water and have not gone dry this past summer.

January 21, 1939

Thorpe Well Company
2340 Sixth Avenue
Des Moines, Iowa

Gentlemen:

In Dr. Hershey's absence, I am enclosing a copy of the generalized log for the Lenox city well. I sincerely hope the delay has not greatly inconvenienced you, since it was necessary to prepare this log from our detailed descriptive logs, and it was found necessary to check at several points.

Very truly yours,

WCS:LM
Enc.

W. C. Schuldt

Copy for Adams Equip. / Rep

GENERALIZED LOG LENOX CITY WELL

Drilled 1934-1935

Curb Elevation 1297'

<u>No.</u>	<u>Description</u>	<u>Thick</u> <u>Ft.</u>	<u>From</u> <u>Ft.</u>	<u>To</u> <u>Ft.</u>
PLEISTOCENE SYSTEM				
	Recent			
1.	Loess and soil	10	0	10
	Kansan			
2.	Gumbotil, brown	23	10	33
3.	Drift, light brown, sandy, pebbly	44	33	77
4.	Drift, gray, sandy, pebbly	10	77	87
	Nebraskan			
5.	Gumbotil, gray, sandy	10	87	97
6.	Drift, light brown, sandy	70	97	167
7.	Drift, dark gray, pebbly, gravelly between 160-165', 225-240', 245-255'	89	167	256
8.	Drift, buff and light gray (reworked weathered Pennsylvanian	18	256	274
PENNSYLVANIAN SYSTEM				
	Virgil Series			
	Shawnee Group			
	Oread Shale			
9.	Shale, black, calcareous	8	274	282
10.	Shale, gray, calcareous	18	282	300
	Toronto Limestone			
11.	Limestone, light gray, with bands of shale	7	300	307
	Douglas Group			
	Lawrence Shale			
12.	Shale, green gray, calcareous, thinly bedded	4	307	311
13.	Shale, red, calcareous, with thin bands of limestone	14	311	325
14.	Shale, light gray, calcareous, with red shale band between 347-350	39	325	364
	Stranger Sandstone			
15.	Sandstone, gray, calcareous, micaceous, shaly	13	364	377
16.	Shale, gray, calcareous, with red bands between 377-380	6	377	385
	Missouri Series			
	Pedee Group			
	Weston Shale			
17.	No sample	2	385	387
18.	Shale, gray, calcareous, with red shale band between 388' and 390'	7	387	394
19.	Shale, black, calcareous	4	394	398
20.	Shale, gray, calcareous, with red shale bands between 401-403' and 408- 410'	15	398	413

		<u>Thick</u> Ft.	<u>From</u> Ft.	<u>To</u> Ft.
	Lansing Group			
	Stanton Limestone			
21.	Limestone, buff to light gray	9'6"	413	422'6"
	Vilas Shale			
22.	Shale, gray green, calcareous, with occasional bands of limestone	17'6"	422'6"	440
	Plattsburg Limestone			
23.	Limestone, light gray, fine grained, dense	11	440	451
	Kansas City Group			
24.	Shale, gray, calcareous, with thin limestone bands	5	451	456
25.	Shale, dark gray to black	4	456	460
26.	Shale, red and gray calcareous	2	460	462
27.	Limestone, buff, dense	2	462	464
28.	Shale, light to dark gray, calcareous, with band red shale between 464-468', band limestone between 476-478'	30	464	494
29.	Shale, dark gray to black, calcareous	2	494	496
	Bonner Springs Shale			
30.	Shale, dark red, calcareous	9	496	505
31.	Shale, gray, calcareous	11'6"	505	516'6"
	Island Creek Shale			
32.	Shale, dark gray to black, with thin limestone bands	11'6"	516'6"	528'
	Argentine Limestone			
33.	Limestone, buff, fine crystalline, dense	10	528	538
	Muncie Creek Shale			
34.	Shale, light gray, calcareous	6	538	544
35.	Shale, black, carbonaceous, calcareous	2	544	546
	Chanute Shale			
36.	Shale, light gray, calcareous	10	546	556
	Cement City Limestone			
37.	Limestone, light buff, dense	10	556	566
	Quivira Shale			
38.	Shale, black	6	566	572
39.	Shale, gray, calcareous, friable	4	572	576
	Westerville Limestone			
40.	Limestone, medium to dark gray, with a shale band from 579'6" to 580'	6	576	582
	Cherryvale Shale			
41.	Shale, dark gray to black, calcareous, with thin lenses of limestone	18	582	600
	Bronson Group			
	Winterset Limestone			
42.	Limestone, light gray to buff, shaly, with red and green shale bands	21	600	621
	Galesburg Shale			
43.	Shale, dark gray to black, calcareous, pyritic	10'6"	621	631'6"

		<u>Thick</u> Ft.	<u>From</u> Ft.	<u>To</u> Ft.
	Bethany Falls Limestone			
44.	Limestone, cream to light gray, soft, fossiliferous, cherty	27'6"	631'6"	659
45.	Shale, dark gray to black	2'6"	659	661'6"
46.	Shale, gray, calcareous	9'6"	661'6"	671
	Hertha Limestone			
47.	Limestone, brown, medium crystalline	8	671	679
48.	Shale, light gray, calcareous	4'6"	679	683'6"
49.	Limestone, buff, fine crystalline, dense	1'6"	683'6"	685
50.	Shale, light gray, friable, cal- careous	1'6"	685	686'6"
51.	Limestone, light gray, dense	1'6"	686'6"	688
	Ovid Coal			
52.	Shale, dark gray to black, cal- careous	5	688	693
53.	Shale, light gray, calcareous, smooth	13	693	706
	Fragmental Limestone			
54.	Limestone, buff, dense	10	706	716
	Bourbon Formation			
55.	Shale, gray, calcareous	2	716	718
56.	Shale, red and gray, calcareous, with thin bands limestone	4	718	722
57.	Shale, gray, calcareous	4	722	726
58.	Shale, red and gray	11	726	737
	Des Moines Series			
	Marmaton Group			
59.	Shale, light gray to green gray with red bands between 760-762' and 1' dark red band between 780' and 781'	48	737	785
	Worland Limestone?			
60.	Limestone, buff, dense	3	785	788
61.	Shale, gray, calcareous, with red bands between 806' and 810'	27'6"	788	815'6"
62.	Shale, red with gray bands, calcareous	9'6"	815'6"	825
63.	Shale, gray, calcareous	4	825	829
64.	Shale, dark gray to black, calcareous	6	829	835
65.	Shale, light gray, calcareous	7	835	842

		<u>Thick</u> Ft.	<u>From</u> Ft.	<u>To</u> Ft.
66.	Darbyville or "50 Ft." limestone Limestone, buff, medium crystal- line	5	842	847
67.	Shale, gray to green gray, cal- careous	39	847	886
68.	Shale, red and gray, calcareous, blocky	8	886	894
69.	Shale, gray, calcareous	37'6"	894	931'6"
70.	Shale, dark gray, to nearly black Brazil or "17 Ft." Limestone	8'6"	931'6"	940
71.	Limestone and shale bands, gray, calcareous	7	940	947
72.	Shale, dark gray to black, fissil, thinly laminated, calcareous in parts, "Mystic Coal" at 962'	17	947	964
73.	Sandstone, dark gray, fine, micaceous	3	964	967
74.	Shale, medium gray, calcareous	12'6"	967	979'6"
75.	Shale, dark gray, calcareous, fissil, micaceous	4'6"	979'6"	984
76.	Shale, light gray, calcareous	10'6"	984	994'6"
77.	Shale, dark red to light gray, calcareous, friable, pyritic	2'6"	994'6"	997
78.	Shale, light gray, calcareous, friable	23	997	1020
79.	Shale, dark gray, soft, unctuous	13	1020	1033
80.	Shale, gray, calcareous, soft	17	1033	1050
81.	Shale, red, brown, and gray bands, with a black band from 1058 to 1059'	12	1050	1062
82.	Shale, light to medium gray, calcareous, soft, with 4' dark gray shale at the top	20	1062	1082
83.	Siltstone, to sandstone, light gray, calcareous	3	1082	1085
84.	Shale, dark gray to black, firm, calcareous	12	1085	1097
85.	Siltstone, light gray, non- calcareous, sandy friable	5	1097	1102
86.	Shale, red and gray, firm, soapy	12	1102	1114
87.	Siltstone and shale, gray, non- calcareous, sandy	18'6"	1114	1132'6"
88.	Shale, dark gray to black, cal- careous, soapy	3'6"	1132'6"	1136
89.	Shale, medium gray, firm, soapy	5	1136	1141
90.	Shale and siltstone, gray and red	4	1141	1145
91.	Siltstone, gray, calcareous	4'6"	1145	1149'6"
92.	Shale, gray to dark gray with red and black bands	23	1149'6"	1172'6"

		<u>Thick</u> Ft.	<u>From</u> Ft.	<u>To</u> Ft.
93.	Sandstone, fine grained, silty	7	1172'6"	1179'6"
94.	Siltstone and shale, red and gray and black banded, grading to black at base	12	1179'6"	1191'6"
95.	Sandstone, fine grained	5	1191'6"	1196'6"
96.	Shale, medium gray, calcareous	4	1196'6"	1200'6"
97.	Sandstone, fine grained	45	1200'6"	1245'6"
98.	Siltstone, dark gray to black, non-calcareous, firm	5	1245'6"	1250'6"
99.	Shale, gray to black, sandy	9	1250'6"	1259'6"
100.	Sandstone, fine grained, shaly	18	1259'6"	1277'6"
101.	Shale, gray, massive, non-calcareous	4	1277'6"	1281'6"
102.	Sandstone, fine grained	15	1281'6"	1296'6"
103.	Siltstone, light to dark gray, massive, non-calcareous	5	1296'6"	1301'6"
104.	Sandstone, gray, fine grained, with occasional stringers, gray to black shale	55'6"	1301'6"	1357
105.	Siltstone, light to dark gray, thinly laminated, firm	9	1357	1366
106.	Sandstone, fine to medium grained, non-calcareous	30'6"	1366	1396'6"
107.	Siltstone, dark gray and dark red, non-calcareous	5	1396'6"	1401'6"
108.	Shale, dark gray, calcareous	7'6"	1401'6"	1409
109.	Sandstone, fine grained	1'6"	1409	1410'6"
Mississippian System				
Meramec Series				
Ste. Genevieve Formation				
110.	Limestone, shaly, sandy, calcareous	12	1410'6"	1422'6"
111.	Sandstone, fine to medium grained	33	1422'6"	1455'6"
St. Louis Formation				
112.	Limestone, brownish buff, fine to medium grained, dense	22	1455'6"	1477'6"
113.	Sandstone, fine grained	7	1477'6"	1484'6"
Osage Series (?)				
Keokuk Formation				
114.	Limestone, light gray to buff, medium grained	8	1484'6"	1492'6"
115.	Limestone, light to dark brown, fine to medium crystalline, pyritic, cherty, fossiliferous, some horizons containing glauconite	82'6"	1492'6"	1575
116.	Limestone, chert, gray, light brown or dark brown	19'6"	1575	1594'6"
Burlington Formation (?)				
117.	Limestone, cream to buff, medium crystalline, cherty	5'6"	1594'6"	1600

		<u>Thick</u> Ft.	<u>From</u> Ft.	<u>To</u> Ft.
118.	Limestone, light buff to light gray, medium crystalline cherty, granular texture	11'6"	1600'	1611'6"
119.	Limestone, light to medium gray, fine crystalline	25	1611'6"	1636'6"
120.	Limestone, buff and light gray, medium crystalline, cherty	9	1636'6"	1645'6"
121.	Limestone, light gray, medium crystalline, cherty	10	1645'6"	1655'6"
122.	Limestone, buff to light gray, cherty	5	1655'6"	1660'6"
123.	Limestone, light to medium gray, granular, porous, cherty	14	1660'6"	1674'6"
124.	Limestone, with much chert, light gray	15	1674'6"	1689'6"
125.	Limestone, buff and light gray, granular, porous, cherty	9	1689'6"	1698'6"
	Kinderhook Series			
	Hampton Formation			
126.	Limestone, buff to brown, medium to fine crystalline, cherty	19	1698'6"	1717'6"
127.	Limestone, medium to dark gray, medium crystalline, granular, porous, shale band at base	4	1717'6"	1721'6"
128.	Limestone, light gray to dark brown, medium crystalline	9'6"	1721'6"	1731
129.	Chert and brown limestone, chert gray	6'6"	1731'	1737'6"
130.	Limestone, buff, oolitic	10	1737'6"	1747'6"
131.	Limestone, buff, medium crystalline, granular, porous	5'6"	1747'6"	1753
	Maple Mill Shale			
132.	Shale, light gray, calcareous, soft, friable	4'3"	1753'	1757'3"

IOWA STATE COLLEGE
OF AGRICULTURE AND MECHANIC ARTS
AMES, IOWA

*Mr. Drawbridge: I should
like to have this and the
strips when you have gone
over them.*

Lennox well / *1122*

DEPARTMENT OF GEOLOGY

November 30, 1940

Dr. H. G. Hershey
Iowa Geological Survey
Iowa City, Iowa

Dear Garland:

It was good news to learn that young Garland is improving satisfactorily.

At long last I have found time to get the information that you requested on the Lenox and Phillips wells. After taking the three days in the middle of last week for the trip with the Kansas people, it took me until Tuesday to bring my class work up-to-date. I was therefore not able to look at the logs until Wednesday. I worked Thursday and Friday looking over all of the plotted logs that I have of southwestern Iowa and I believe now we have sufficient information to make some pretty good correlations in the Pennsylvanian section. Four of the logs were studied carefully: the Lenox, Bedford, Creston, and New Market holes, and they compare favorably.

The Bedford and Lenox logs were sent to me by McQueen and I think I sent them to you some time ago that you might copy them. If you have not already done so, you will probably want to copy them now. I would like them returned when you have finished. I have today plotted to scale the log of the New Market coal test that Frank Green sent me; I seem to remember your copying it too. I would also like the plotted log returned after you have compared it with the other three. The fourth strip log is the Creston well; I presume this is the only plotted section you have, but if you can prevail on one of your boys to copy it, I would appreciate a duplicate. I think it is smart to use the same scale on the strip logs as that used by the Missouri Survey, for then comparison is easy. You will note that I had to use a ruler in drawing up the New Market log. Could you spare me about two dozen blank log strips?

If you disagree with any of the correlations, let me know why.

Cordially yours,

L. E. Cline

L. E. Cline

LMC/b
Enc: 3

Lenox Well

The description of samples by the Missouri Survey seems to be more complete than Tester's description. This is not so apparent until the two descriptions are compared with the log of the Bedford well. When the strip logs of the Bedford and Lenox wells which were compiled by the Missouri Survey are placed side-by-side, it is quite evident that the Missouri description of the Lenox well is more thorough, or at least is better interpreted than Tester's. Compare them and you will see what I mean.

Comments

1. In answer to your question about the Toronto ls., Garland, I would say that Tester has correctly named it. It is present in the Lenox, Bedford, and New Market holes and in each case the red shale of the Lawrence fm. is immediately below it.
2. The term Lawrence-Stranger should be used to describe the shale and sandstone from 303-408. It should be hyphenated, as I have it here.

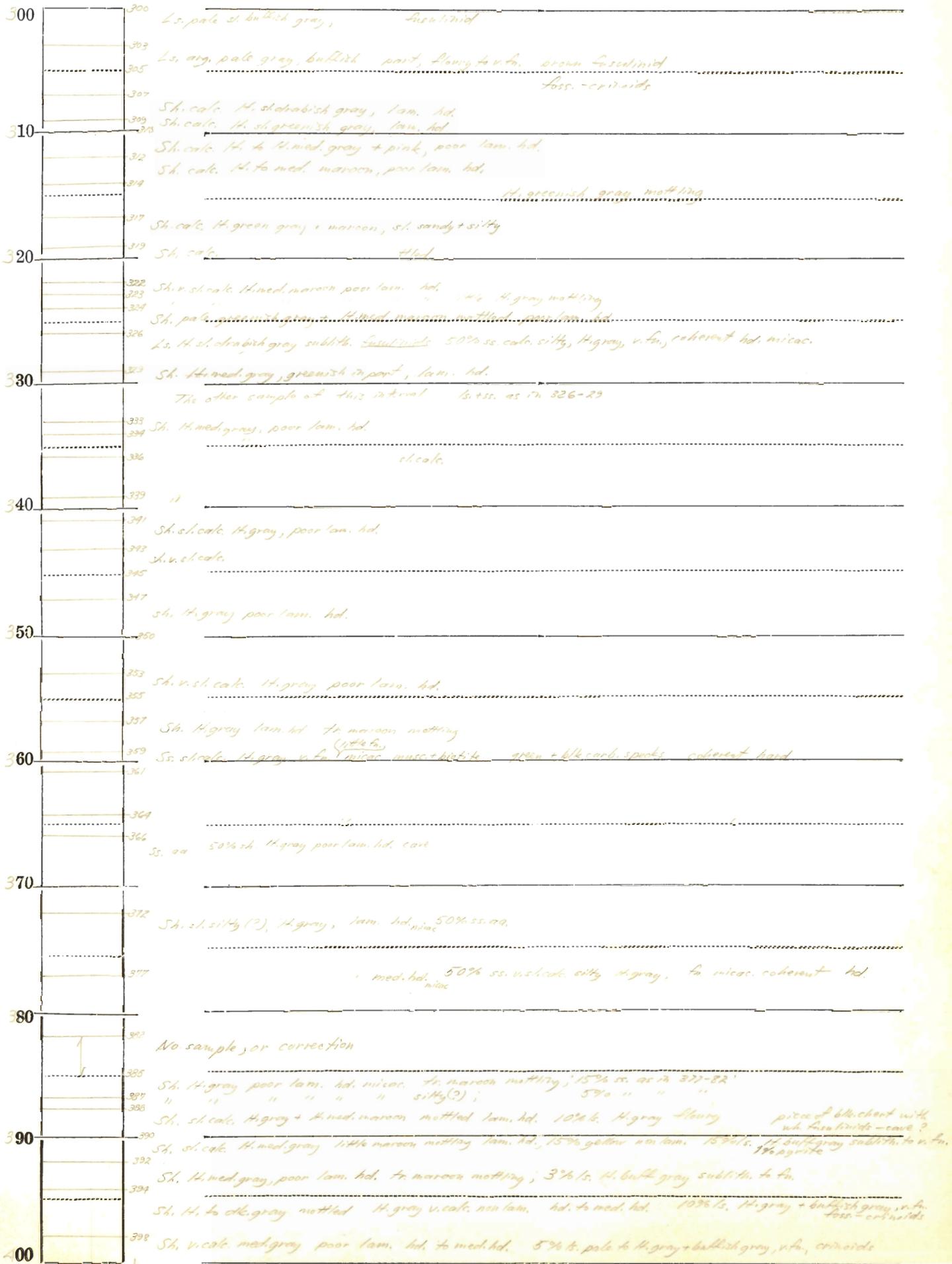
Note.-I will not bother to give thicknesses and depths for the various units; they can be obtained by referring to the names which I have penciled in on the strip log. The typed names, i.e., glacial drift, Douglas, Kansas City - Lansing, Pleasanton, Henrietta, Cherokee, etc. were put there by the Missouri Survey.

I would draw the base of the Virgil series at the top of the Iatan limestone. The Lawrence-Stranger is thinner at Lenox than at Bedford; this may be owing to the general tendency of the shales of the Virgil to thin northeastward toward that margin of the Forest City Basin or it may be because of the unconformity at the base of the Virgil, or it may be the result of both.

3. The Missouri log shows limestone from 408-422, though Tester logs the zone as occurring between 415-422. In either case it appears to be Iatan. Tester calls it Stanton.
4. I would call Tester's Vilas, Weston.
5. Tester's Plattsburg is Stanton
6. The shaly limestones around 463 and 476 in both logs (Tester's and Missouri's) are Plattsburg.

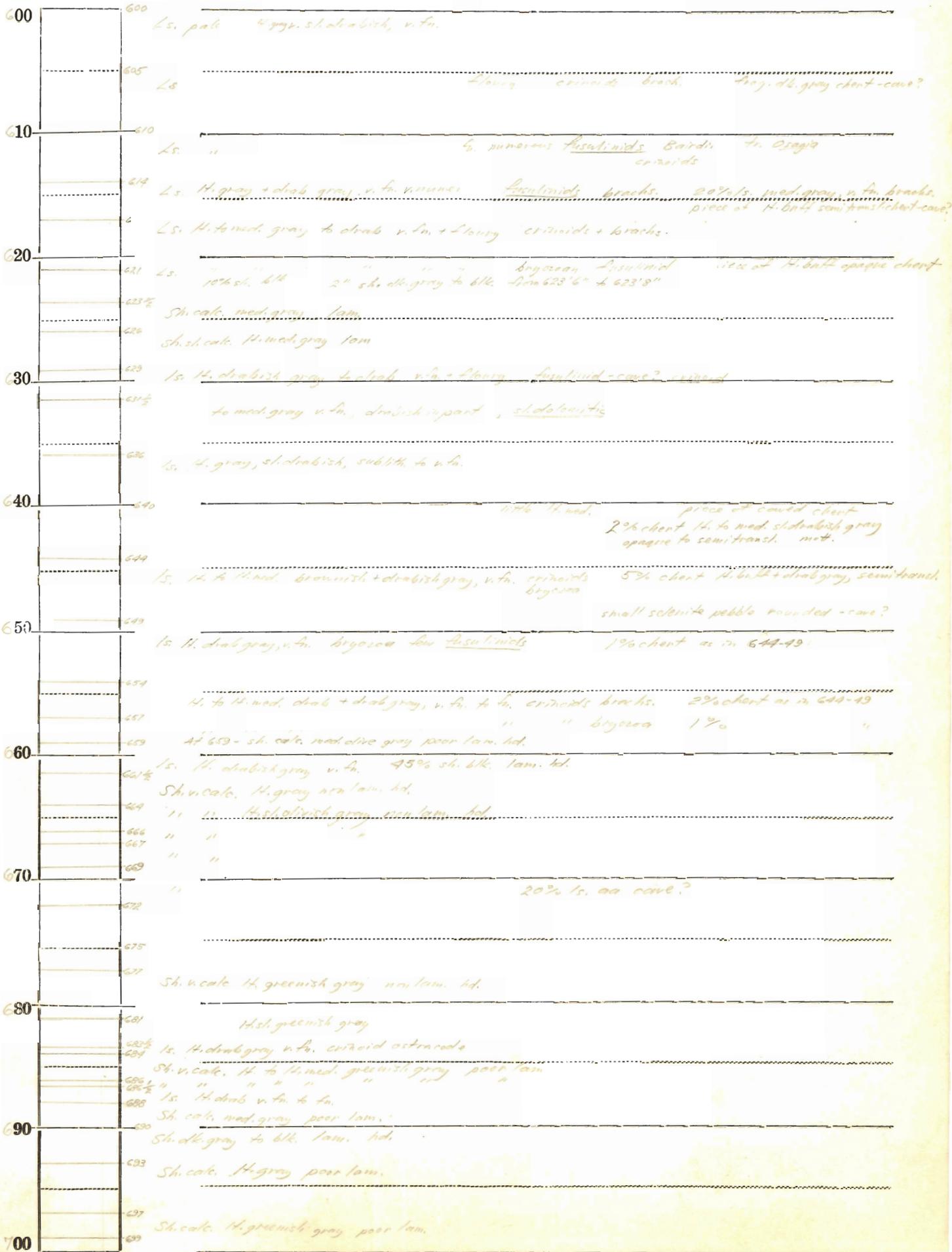
7. The red shale around 500 feet is almost certainly Bonner Springs, as Tester has correctly named it. This is a fairly dependable horizon.
8. Tester's Argentine is o.k.
9. Tester's Muncie Creek-Chanute shales are o.k.
10. Tester has correctly picked the top of the Cement City ls. but the base of it extends downward to include what he has called Westerville. The dark shale that he calls Muncie Creek is a dark shale in the Cement City; this member is considerably thicker on the outcrop in north-western Decatur County than in Madison County; Tester evidently relied on the Madison Co. thickness.
11. I would place the top of the Westerville at 600ft., which is where he places the top of the Winterset. Missouri fails to check his observation that chert is abundant.
12. His Galesburg sh. is Cherryvale sh.
13. His Bethany Falls is Winterset. He does not record chert from this horizon; Missouri shows it to be abundant, as it should be.
14. His Hertha is Bethany Falls. I am surprised that this limestone, normally 22 ft. and plenty hard, does not show better in the Lenox well. It is recorded as shaly limestone by Missouri. Probably owing to poor sampling, as it has its normal development in the Bedford, New Market, and Creston holes.
It is not hard to see why Tester picked this as the Hertha; he expected a thick, hard, medium to light-gray limestone at this position.
15. Tester's Ovid is the black shale of the Hushpuckney.
16. Tester's "Fragmental" is the Hertha
17. Tester's Worland is the "Fragmental".
18. Tester's Darbyville is Worland.
19. Missouri logs a black shale and coal at 912 ft.; this should be Mystic; its caprock, the Pawnee limestone, is normally about a foot thick and could easily have been missed in sampling; further, the caprock is absent in some places.
Note that the Worland ls. and Mystic coal are at respectively comparable horizons in the Bedford log; right on the head.

20. Tester's "Brazil" is probably the lower Fort Scott
(= Blackjack Creek limestone of new terminology).
21. Tester's Mystic coal is the Mulky.
22. Tester's limestone at 1035-1040 is the Ardmore. A
look at the Bedford well shows the limestone too, and
just above it in its proper place, the Bevier coal.

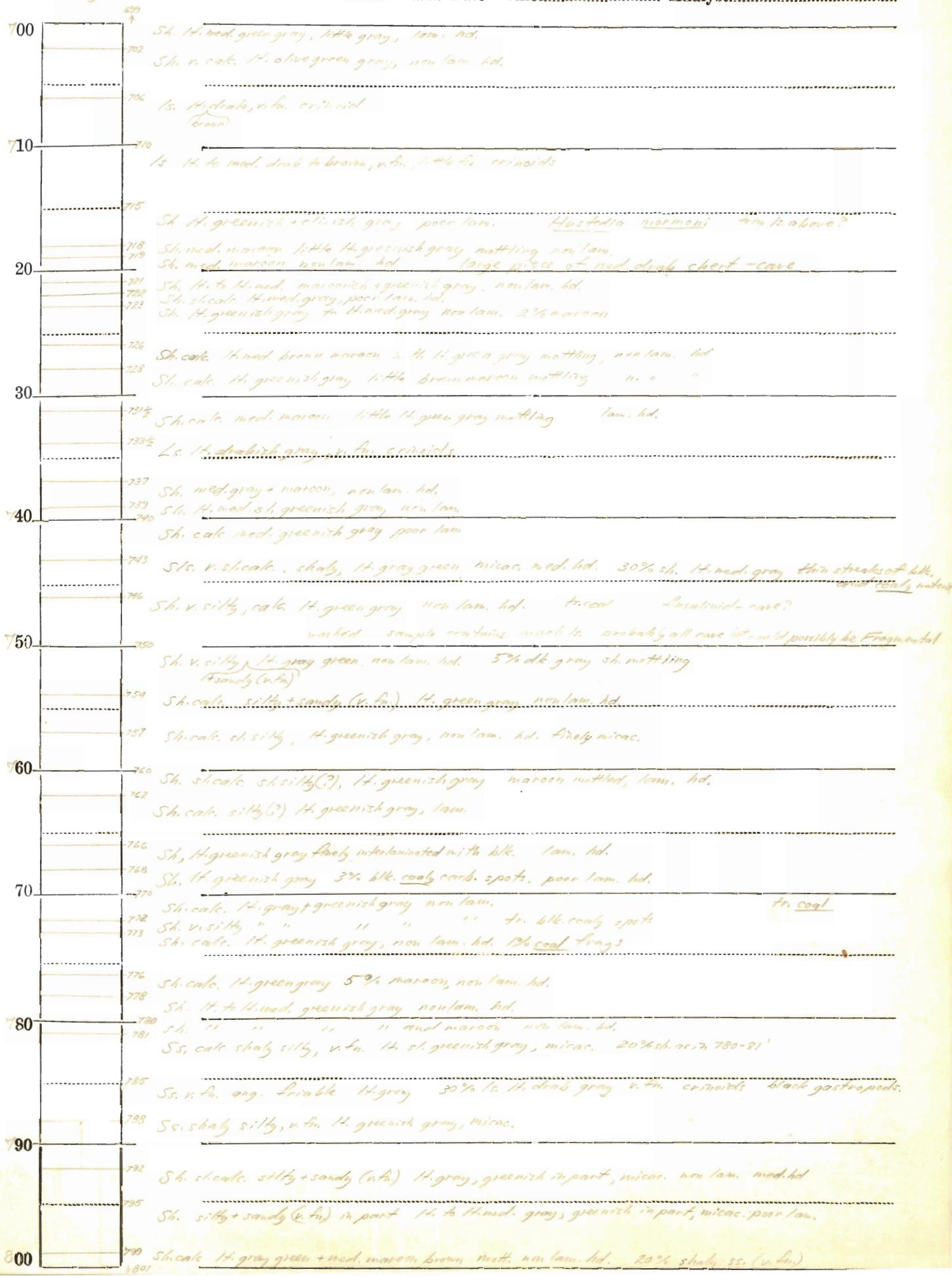


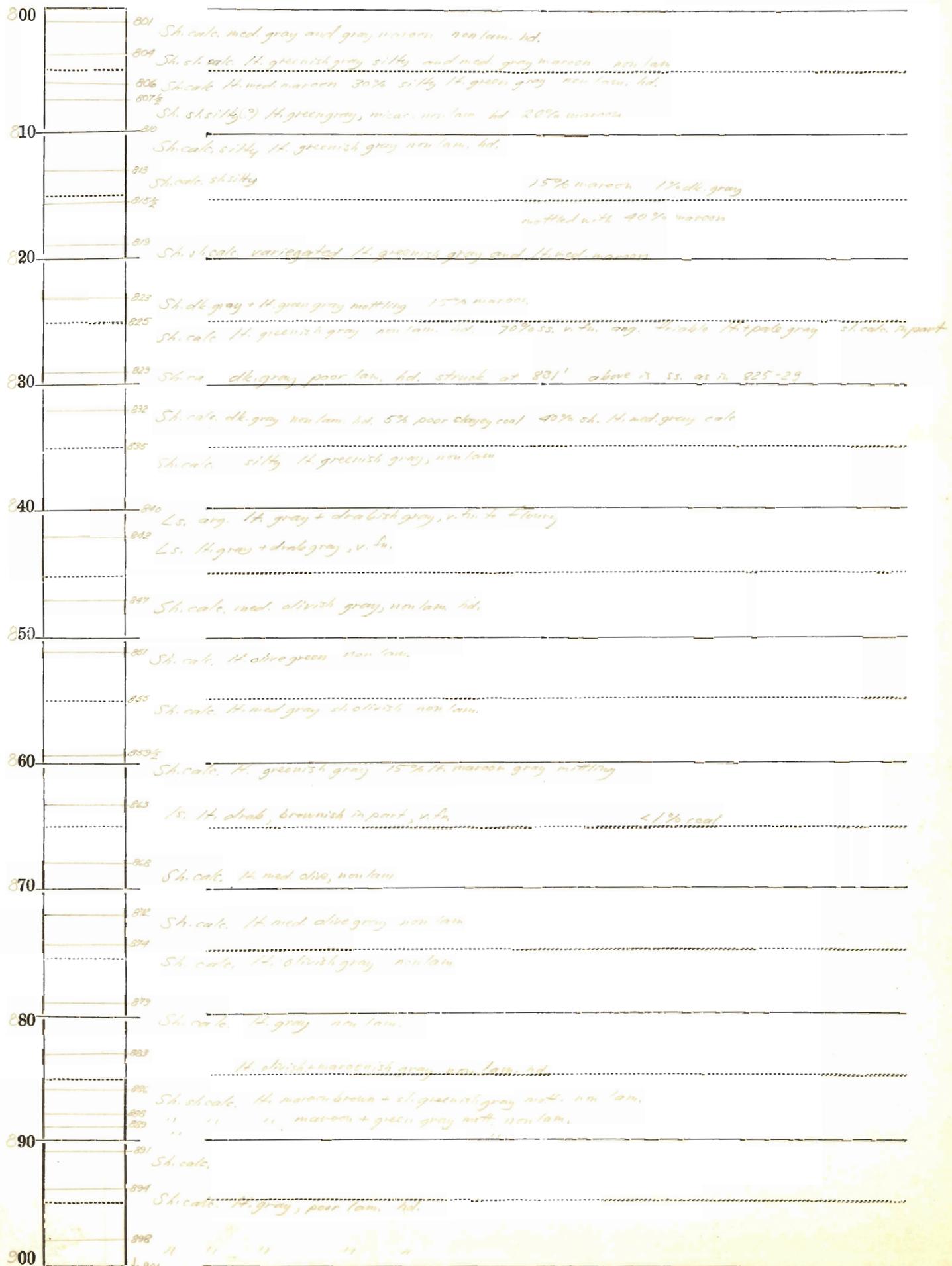
500	500 Sh. calc. H. med. maroon + H. greenish gray mottled non lam. hd.
	502 Sh. calc. H. med. maroon non lam. hd.
	505 Sh. calc. H. greenish gray non lam. hd.
	506 Sh. v. calc. H. sl. greenish gray " "
	507 Sh. calc. H. med. gray, non lam. hd.
510	510 Sh. calc. med. gray, " lam. hd.
	515 " "
	516 1/2 Sh. calc. H. to med. gray little maroon, non lam. hd.
520	519 Sh. calc. H. to dk. gray non lam. hd. cased ls.
	520 1/2 Sh. calc. H. gray non lam. hd. <i>Ambocoelia</i>
	522 Sh. calc. H. gray non lam. hd.
	524 Ls. arg. H. gray, shaly, <i>Leptæa brachs. crinoids</i> ; 20% sh. calc. H. gray
530	528 Ls. pale to H. sl. br. bluish gray, v. fm.
	532 " " <i>crinoids</i>
	534 Ls. H. gray + bluish gray <i>brachs. crinoids</i>
540	538 Ls. as in 534-38' 30% sh. calc. H. gray + sl. greenish gray poor lam. hd.
	541 Ls. as in 534-38' 50% sh. calc. " " <i>Ambocoelia</i>
	543 Sh. calc. H. to med. gray, non lam. hd. <i>brachs.</i>
	544 Sh. dk. gray to bl. <i>brachs. crinoids</i> , poor lam. hd.
	546 Sh. v. calc. H. gray poor lam. hd. <i>tr. maroon mottling</i>
	548 " " " non lam. hd. <i>tr. blk</i>
550	550 " " " "
	553 Sh. calc. H. gray, v. sl. greenish, non lam. hd.
	556 Ls. pale to H. gray + bluish gray, v. to <i>brachs. fusulinid crinoids</i>
560	560
	564 Ls. H. brown gray v. fm. <i>brachs. crinoids</i> 6" of sh. at base, calc. H. sl. greenish gray
	567 Sh. sl. calc. dk. med. gray 5% med. maroon + H. greenish gray mottled
570	569 Sh. calc. H. gray, v. sl. greenish non lam. hd. <i>much low-cored?</i>
	572 Ls. arg. H. gray + drabish gray v. fm. + shaly <i>small clastic(?) in frags.</i> <i>conc. med. brown chert with fusulinids</i>
	576 Ls. H. brownish gray, v. fm. <i>numerous fusulinids to Oragis</i> <i>piece of chert black + H. gray mottled opaque</i> <i>astracode crinoids</i>
580	579 1/2 Ls. v. arg. H. gray shaly <i>brachs. crinoids</i>
	582 Ls. H. sl. brownish drab, v. fm. <i>brachs. crinoids numerous; Oragis</i>
	584 Sh. v. calc. med. gray non lam. hd. <i>piece of coal</i>
	586 " "
90	589 Sh. calc. med. gray non lam. hd.
	591 " "
	593 " " " and H. olivish gray, non lam. hd.
	595 Sh. calc. H. med. gray non lam. hd.
00	599 Sh. sl. calc. H. olivish gray non lam. shaly <i>brachs. crinoids</i> hd.
	600

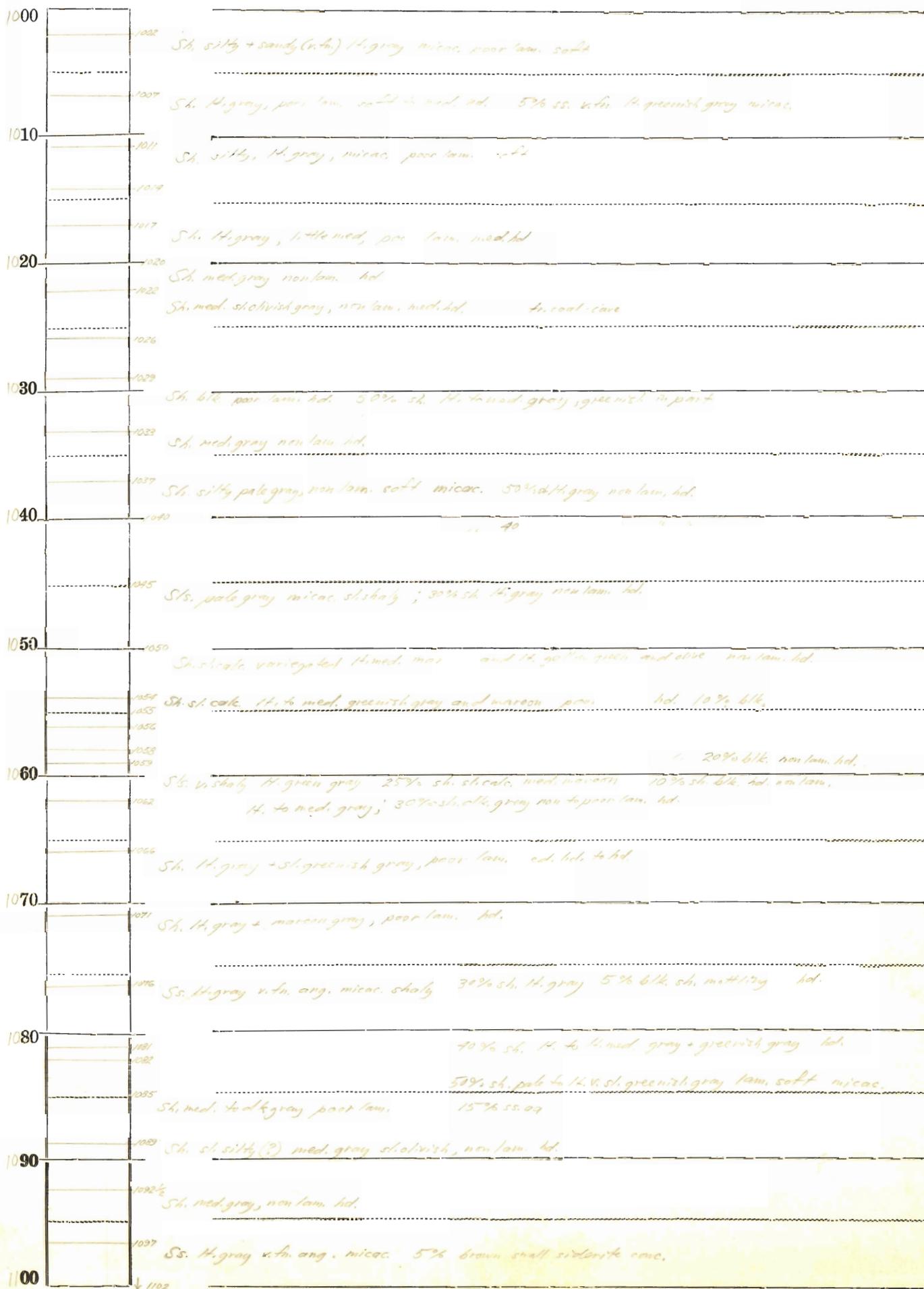
Location Taylor Co. Date Drilled _____ Analyst Elias Dec 9 1940

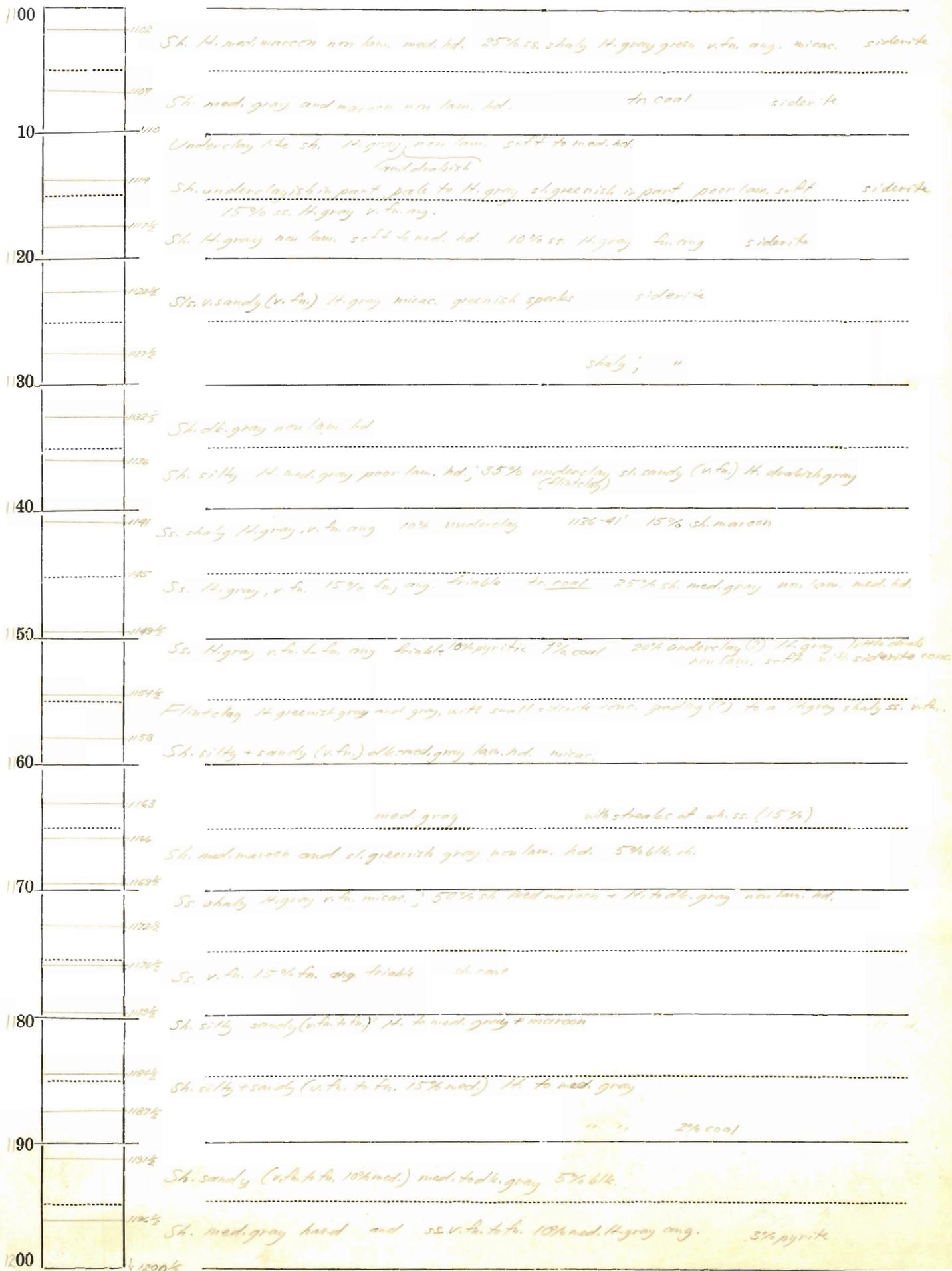


Location Taylor Co Date Drilled _____ Analyst Elmer D. A. 1922



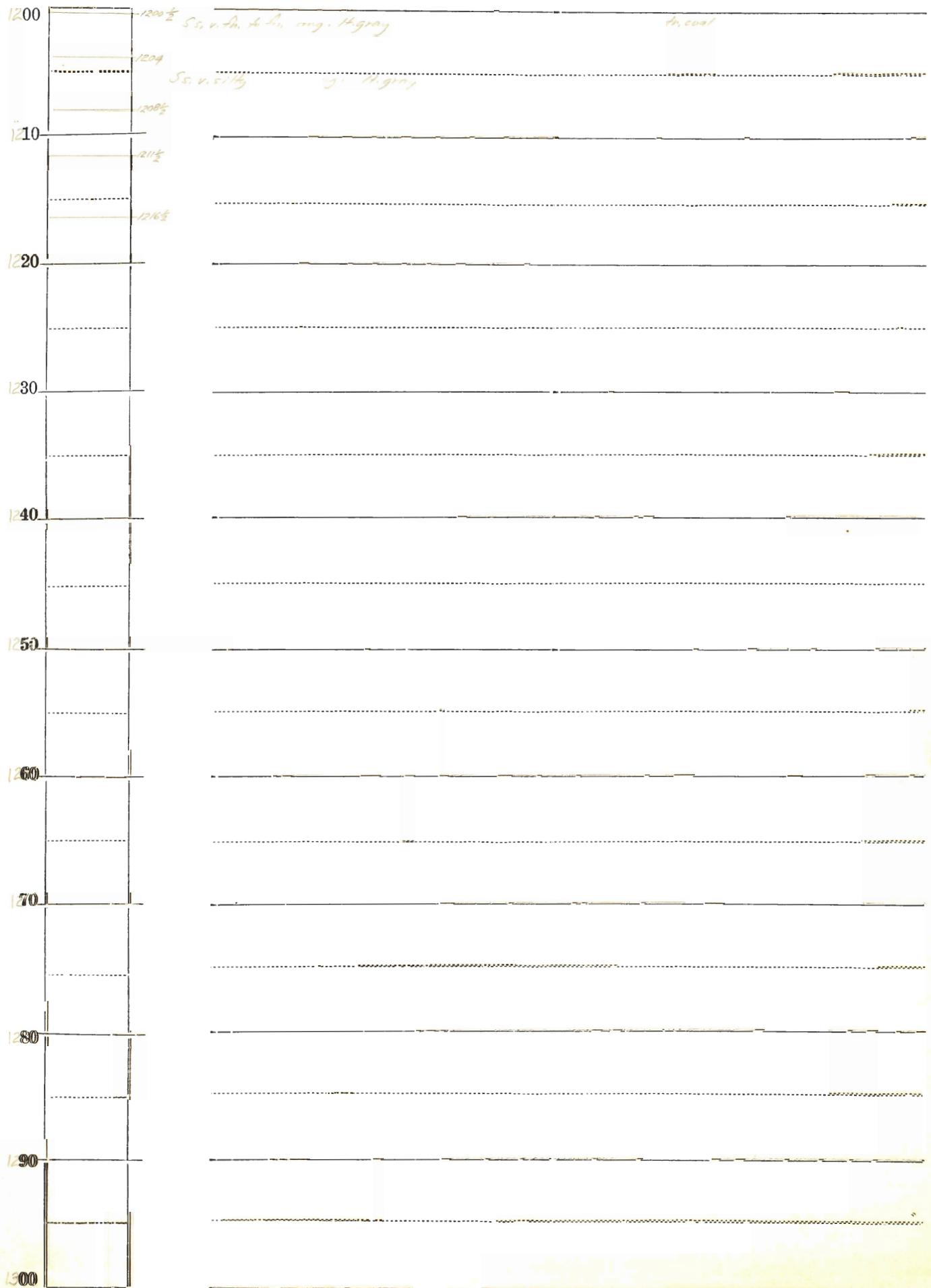




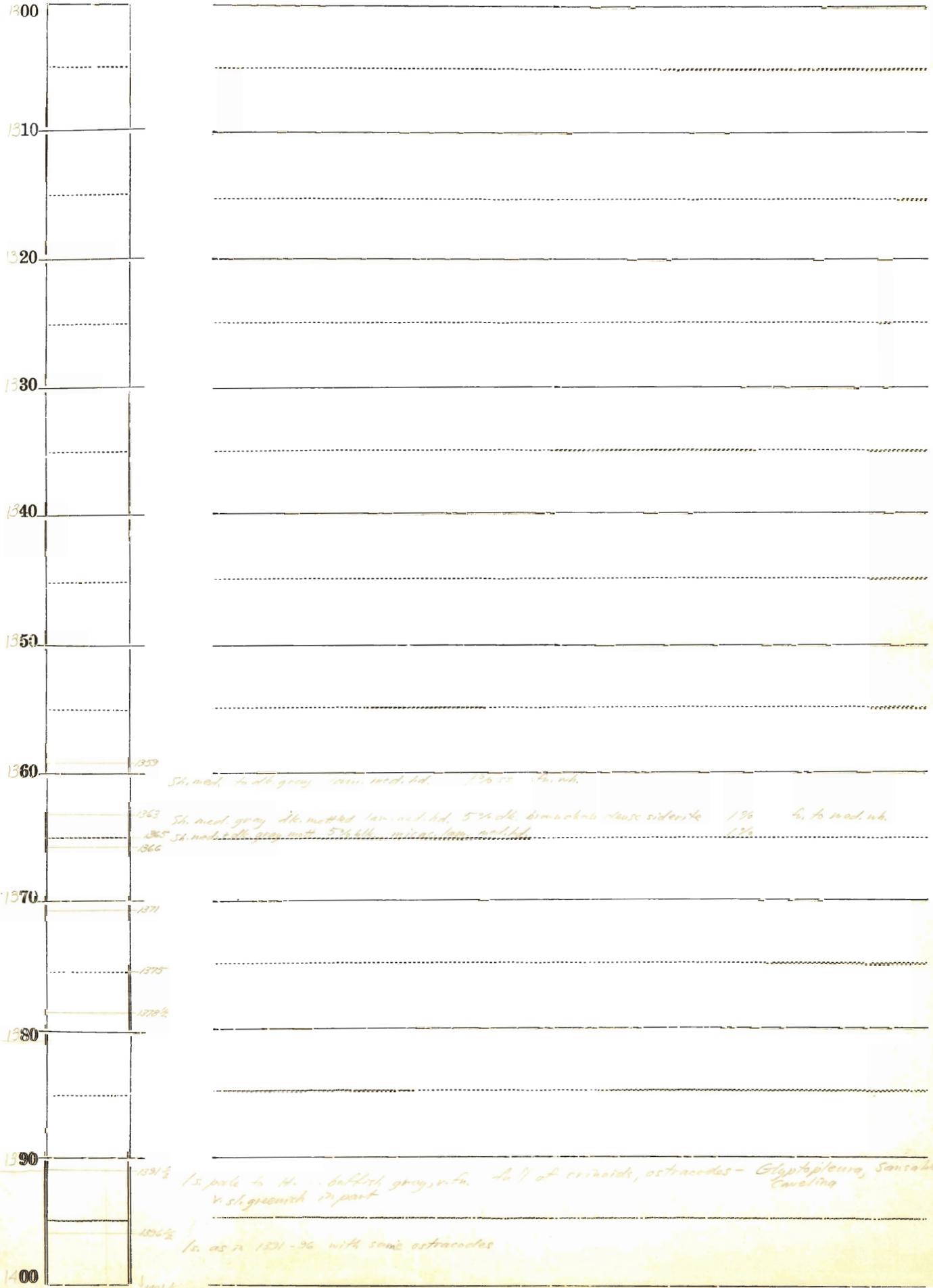


Sheet No. 13 Name of Well Lenox Town Well Survey No. W-0117

Location Taylor Co Date Drilled _____ Analyst Elias Dec 6 1940



Location Taylor Co Date Drilled Analyst M. Elias Nov 25 1940



1360 Sh. med. to dk. gray calc. med. hd. 1363 to 1366 sh. wh.

1363 Sh. med. gray dk. mottled lam. med. hd. 5 1/2 dk. brachiozoa dense siderite 1% 4. to med. wh.

1365 Sh. med. to dk. gray med. 5 1/2 dk. micae low med. hd. 1%

1366

1371

1375

1378 1/2

MISS? 1380

MISS? 1390

1390 1/2 ls. pale to dk. buffish gray, v. fr. ls. of corals, ostracodes - *Glyptopleura*, *Sarcosphaera*?, *Camelina*
v. sh. greenish in part

1396 1/2 ls. as in 1391-96 with some ostracodes

1400 1/2

Location Taylor Co. Date Drilled Analyst Elmer Nov. 25, 1940

1400	1401 1/2 1402 1/2	only bit sample which is Penn. lg med. to dk. gray sh. 15% ss.
	1405 1/2	ls. med. to dk. olive gray, sub. to ss. 20% green sh. - conc.
1410	1409 1410 1/2	sh. calc. H. green + green gray 35% ls. H. gray brachs. + corinoids v. med. H. green gray sub. to ss.
	1414 1/2	ls. pale to H. gray, v. to sub. to ss. 5% H. green sh.
1420	1418 1/2	ls. pale gray shaly
	1422 1/2	25% ls. pale to H. sh. to sub. to ss. 10% H. green sh. + corinoids 65% ss. ls. little to med. gray. 11% sh. H. green calc.
	1427	ls. H. drabish gray, v. to ss. 65% ss. ls. 10% v. to med. A-a 10% sh. H. green calc.
1430	1432	ls. drabish + green to gray, v. to ss. 10% ss. as in 1427-32 15% sh. H. green v. calc.
	1435 1/2	ls. drab. gray, clastic in part 10% sh. H. green v. calc.
1440	1439 1/2	trace orange opaque chert
	1443 1/2	chalcedony or chalcedonic chert
	1447 1/2	to. laminae mottling in ls. 5% chalcedony 10% drab v. to little drab, mottling
1450	1451 1/2	Dolo. H. to med. drab + trace lg, v. to ss. 10% ss. 10% chalcedony wh. trace pink little ls. - conc.?
	1455 1/2	Dolo. H. to H. med. brown brown drab v. to. 10% dr. gray chert 10% ss. aa
1460	1460	Do brown + brown drab v. to 5% + green sh. conc.
	1465 1/2	
1470	1470 1/2	Dolo. med. brown + brown drab v. to. 10% chert + opaque wh. 10% H. to dk. gray mottling 5%
	1474 1/2	
	1477 1/2	
1480	1479 1/2	ls. v. to brownish gray, sub. to. to v. to ss. 30% ss. aa conc. sh. conc.
	1481 1/2	ls. H. gray + drab gray v. to. 30% ss. aa conc. sh. conc. H. drab sh. gray, v. to "
	1484 1/2	ls. H. drabish gray, v. to. 40% chalcedony to some harsh chert wh. + pink
1490	1488	sh. calc. green gray neolite, unctious looking, med. to. 30% ls. 15% chalcedony + some pink chert
	1492 1/2 1493 1/2	Dolo. med. to dk. drab, v. to. 20% sh. aa. 5% chalcedony
	1498 1/2	Dolo. H. to dk. drab, v. to. 5% chalcedony H. gray
1500	1498 1/2	

Location Taylor Co. Date Drilled Analyst Elias Nov. 25 1940

K
B
L

1600	1600	ls. H. to med. drab to buff, pteroclastic, many <u>tentaculites</u>	25% chert wh. to H. gray opaque translucent
	1602 1/2	ls. pale to H. buff to drab, med. drab less pteroclastic	18% chert pale to H. gray opaque
	1605 1/2	10% sh. calc. H. med. gray, no fossils, bed	semitransl. mottling blk. bryozoa
	1608 1/2	ls. pale to H. buff, med. drab less, pteroclastic	tr. glauc. 11% chert wh. to pale gray opaque
	1610	ls. pale to H. buff + gray, pteroclastic, 1% glauc.	tracode 7% chert wh. to pale gray opaque to semitransl.
	1611 1/2	ls. pale gray pteroclastic, tentaculite	25% chert wh. opaque dead and vitreous to semitransl.
	1615 1/2		1 1/4% sh.-conc
	1620		4% sh. conc
	1620		tr. glauc. little sh.-conc
	1620		5% chert wh. opaque semitransl. dk. spotted
	1625		tentaculite conc
	1630	ls. pale to H. sh. buffish gray, pteroclastic, tr. glauc.	30% chert wh. to pale gray opaque to semitransl. mottling, little dead
	1630	Dolo. calc. H. buff to tan, sach.	20% chert wh. opaque to transl. little dead, 10% gran. qtz. white
	1633	Dolo. H. buffish gray, tan, sach.	40% chert wh. opaque to transl. little dead
	1636 1/2	Dolo. calc. H. sh. buffish gray, tan, sach.	1% glauc. 30% chert
	1640		
	1640 1/2	Dolo. v. calc. pale to H. sh. buffish gray, v. tan to tan, sach. porous	tr. glauc. 55% chert wh. opaque vitreous + dead to semitransl.
	1645 1/2		transl. 35% dolo. H. to med. gray v. tan to tan.
	1650		
	1650 1/2		chert wh. to H. gray opaque vitreous + dead to chalcedony + clear qtz.
	1655 1/2		30% dolo. H. gray v. tan to tan.
	1660		
	1660 1/2		chert wh. to H. gray, shaly buffish in part opaque to semitransl.
	1664 1/2		38% dolo. arg. H. to med. gray v. tan.
	1665 1/2		
	1670		
	1670 1/2		Dolo. H. gray drabish, v. tan to tan. 10% pale gray chalcedony
	1674 1/2		
	1674 1/2		chert H. gray s.l. bluish + v. drabish, opaque shaly looking, small semitransl. mottling,
	1679 1/2		20% dolo. pale to H. buffish drabish gray v. tan to tan, sach.
	1680		
	1680		chert as in 1674-79 45% dolo. as in 1674-79
	1684 1/2		tentaculite frag. conc?
	1689 1/2		
	1689 1/2		chert wh. to pale gray opaque dead + vitreous, small transl. mottling
	1693 1/2		50% dolo. pale buffish gray tan, sach. transl.
	1690		
	1690		As in 1684-89
	1693 1/2		
	1693 1/2		Dolo. H. to H. med. drab, v. tan to tan, sach. 25% chert as
	1698 1/2		
	1698 1/2		ls. dolomitic H. buff drab, v. tan to coarse, buff is <u>Osgood</u> 1% chert as
	1700		tentaculite - conc?

Location Taylor Date Drilled Analyst Elias Nov 25 1940

	1700	1701 1/2	ls. H. buff drab med. drab foss. fm. to coarse foss. pyrite scapolite 2% chert ag
		1705	
		1707 1/2	bragosa brachi
	1710		scapolite
Lassenville		1711 1/2	Dolo. calc. med. gray drab, fm. scapolite astracods 10% chert pale to dk. gray, sh. drabish in part, opaque little dead
		1715 1/2	
		1717 1/2	Dolo. " " bragosa 1% chert " " "
	1720		ls. dolo. med. drab, pyritic (1%) v. fine tab. br. astracods etc., 15% chert pale to dk. gray opaque dull to dead
		1721 1/2	At 1720 is sh. calc. dk. gray, lam. sand, finely micae
		1724 1/2	Dolo. sh. calc. in part, med. brown drab, fm., 5% chert pale to dk. gray opaque dull to dead
		1726 1/2	15%
		1728 1/2	Dolo. calc. H. to med. gray drab v. to fm. 2%
	1730		2%
		1731	Chert H. gray, opaque dull 25% dolo. dk. drab, fm.
		1734 1/2	30% " " " some fossil ls. Tr. scapolite
North Hill		1737 1/2	ls. H. buff, almost all Osage or irregular oolites.
	1740		
		1742 1/2	
		1744 1/2	(silty) Dolo. sh. calc. in part, H. buff + gray buff, v. to fm. subconc.
English R.		1750	3% dk. purple red hematite
		1753	(slightly greenish) Sh. calc. dk. gray pinkish mottling, poor lam. finely micae med. hd.
		1756	Sh. calc. med. gray, poor lam. med. hd. much oolitic ls. + silty dolo. as covered?
		1757 1/2	
	1760		
	1770		
	1780		
	1790		
	1800		

Location Lenox Iowa

Date Drilled Dec. 1934 Analyst T. H. P. Y.

00

Loess Soil

10

Gumbotil leached and oxidized, brwn. soapy; gtz. frags. A 4-2 mm.

15

Gumbotil - leached and oxidized, brwn. soapy

20

Gumbotil - leached and oxidized brwn. soapy

25

Gumbotil - leached and oxidized, brwn, soapy;

28

Gumbotil - leached and oxidized, brwn, soapy; gtz fragments A to C, 2-1 mm.

30

33

Drift - unleached and oxidized in part H. brwn blocky, micac IR contains clay, 40% silt 40% and sand 20% A to C, 2-1 mm.

36

Drift - unleached and oxidized in part, H. brwn. blocky, micac, IR contains clay 30% silt 50% and sand 20% A to C, maj. gr. 1/2-1/4

40

Drift - H. brwn unleached, oxidized in part, blocky micac. IR contains clay, 50% silt 25% sand 25% A to C, maj. gr. 1-1/2. Glacial pebbles principally 15-100 mm.

45

Drift - dk. brwn unleached, oxidized, soapy, micac IR contains clay, 60% silt 20% sand 20% A maj. gr. 2-1. Glacial pebbles 20-2

49

50

Drift - similar to 45-49.

52

Drift - H. brwn unleached, oxidized, in part, blocky, micac, IR contains clay 60% silt 20% sand 20% A, maj. gr. 1/2

56

Drift - H. brwn unleached, oxidized, blocky micac; IR contains clay 60% silt 20% sand 20% A to C maj. gr. 1/2-1/4

60

63

Drift - H. brwn unleached, oxidized, blocky micac; IR contains clay 40% silt 30% sand 30% A to C maj. gr. 1/2-1/4

66

Drift - H. brwn unleached, oxidized, micac; IR contains clay 50% silt 30% sand 20% A, maj. gr. 1/2-1/4. Glacial pebbles 15-20%

68

70

Drift - similar to 66-68.

72

Drift - H. brwn unleached, oxidized, micac; IR contains clay 20% silt 50% and sand A, maj. gr. 1/2-1/4.

74

Drift - similar to 72-74

77

Drift - gry. unleached unoxidized, micac; IR contains silt 50% clay 30% and sand, 20% A to C, maj. gr. 1/2-1/4. Glacial pebbles 5-10%

79

80

Drift - similar to 77-79

83

Drift - gry. unleached unoxidized, micac; IR contains silt 60% sand, A to C, maj. gr. 1/2-1/4. Glacial pebbles 5-10%

87

Drift - gry. leached in part, unoxidized, micac; IR contains silt 20% clay 50% sand, 30% A to C, maj. gr. 1-1/2. Some gumbotil (?)

90

91

Drift - gry. leached in part, oxidized, micac; IR contains clay 60% silt 20% sand 20% A, maj. gr. 1-1/2. Gumbotil (?)

93

Drift - gry. leached in part, similar to 91-93 Gumbotil (?)

95

Drift - gry. brn. unleached, unoxidized, micac. IR contains silt, 70% sand 20% A, maj. gr. 1/2-1/4. clay 10%

00

Drift - H. brwn. leached oxidized, micac; IR contains clay 50% silt 10% sand 40% A

2 samples
1.77-79
2.77-83

89-97
Gumbotil

Location Lenox, Iowa

Date Drilled Dec. 1934

Analyst Talley

100	Drift - Similar to 99-101 Glacial pebbles 5-10%
105	Drift - H. brwn. unbleached, oxidized; IR contains clay 40% silt 40%
108	Drift - sand 20% A to C, maj. gr. 1/2-1/4. H. brwn. unbleached, oxidized; IR contains clay 20% silt 10% sand 20% A, 1-1/2
110	Drift - Similar to 108-110
113	Drift - H. brwn. unbleached, oxidized, micae; IR contains clay 70% silt 10% and sand 20% A, maj. gr. 1/2-1/4
115 1/2	Drift - H. brwn. unbleached, oxidized, micae; IR contains clay 90%
119	Silt 10% sand 20% A to C, 2-1mm
120	Drift - H. brwn. unbleached, oxidized; micae; IR contains silt 30% clay 30%, sand 20% A to C, maj. gr. 2-1.
124	Drift - H. brwn. similar to 119-124
128	Drift - H. brwn. unbleached, oxidized, micae; IR contains silt 50%
130	clay 25% sand 25% A to C, maj. gr. 1-1/2. Glacial pebbles 5-10%
132	Drift - H. brwn. similar to 128-132
135	Drift - H. brwn. similar to 128-132
138	Drift - H. brwn. unbleached, unoxidized, micae; IR contains silt 50% clay
140	20% sand 30% A to C, maj. gr. 1-1/2 Drift - H. brwn. similar to 138-140, with glacial pebbles 5-10%
143	Drift - similar to 138-140
144	Drift - H. brwn. similar to 138-140 with glacial pebbles 5-20%
147	Drift - H. brwn. unbleached, unoxidized, micae; IR contains silt 20% clay 60%
50	sand, 20% A to C, maj. gr. 1-1/2. Glacial pebbles principally gr. 15-20%
153	Drift - H. brwn. unbleached, oxidized, micae; IR contains silt 60% clay 10% sand,
154	30% A, maj. gr. 1-1/2
155	Drift - gry, unbleached, oxidized in part, micae; washed sample contains sand maj. gr. 1/2-1/4 prin. silt 1/2 A to C. Drift - H. brwn. unbleached, unoxidized, micae
157	Drift - H. brwn. similar to 154-155
60	Drift - H. brwn. unbleached, oxidized, micae (lots of muscovite); IR contains
162	silt 60%, clay 10% sand 30% A, maj. gr. 1-1/2. Drift - H. brwn. similar to 157-162
167	Drift - H. brwn. to gry. unbleached, unoxidized in part; IR contains
168	clay 60% silt 10% sand 30% A to C, maj. gr. 2-1. Glacial pebbles 5-10%
169	Drift - similar to 165-168
70	Drift - gry to dk gry. unbleached, unoxidized, micae; IR contains
172	silt 70% sand 20% A, maj. gr. 1-1/2. Glacial pebbles 1-5%
175	Drift - gry unbleached, unoxidized, micae; IR contains silt 70% clay 10%
178	and sand 20% A, maj. gr. 1/2-1/4. Drift - gry unbleached, similar to 172-175
180	Drift - gry unbleached, unoxidized, micae; IR contains silt, 70% clay 10%
183	sand 20% A, maj. gr. 1/2-1/4. Glacial pebbles 5-10% Drift - gry. similar to 180-183
186	Drift - dk gry. unbleached, unoxidized, micae; IR contains silt 70%, clay
190	10%, sand 20% A, maj. gr. 1/2-1/4. Glacial pebbles 5-10% Drift - Similar to 186-190
195	Drift - gry, unbleached unoxidized, micae; IR contains silt 70% clay 10%
197	sand 20% A, maj. gr. 1/2-1/4. Glacial pebbles 5-10%
200	Drift - Similar to 195-197

Location Lenox, Iowa Date Drilled Dec. 1934 Analyst Talley

200	Drift - gry unleached, unoxidized, micae; IR contains silt 70% sand 30% A to C, maj. gr. 1/2-1/4. Glacial pebbles 5-10%.
204	Drift - Similar to 200-204
206	Drift - gry unleached, unoxidized, micae; IR contains silt 80% sand 20% A to C, maj. gr. 1/2-1/4
208	Drift - similar to 206-208
10	
211	Drift - gry. unleached, unoxidized, micae. IR contains silt, 80% sand 20% A to C, maj. gr. 1/2-1/4. Glacial pebbles 5-10%.
215	Drift - gry, unleached, unoxidized, micae; IR contains silt 80% sand 20% A, maj. gr. 1/2-1/4
217	Drift - similar to 215-217
220	Drift - gry unleached, unoxidized, micae; IR contains silt 80%, sand 20% A to C, maj. gr. 1/2-1/4.
223	Drift - gry unleached unoxidized, micae; IR contains silt 70% sand 30% A to C maj. gr. 1/2-1/4
226	Drift - gry unleached similar to 223-226; washed sample contains gravel 50% sand 48% maj. gr. 1/2-1/4 A to C, pyrite 2%.
230	Drift - gry unleached, unoxidized, micae; IR contains silt, 70% clay 10% sand 20% A, maj. gr. 1-1/2. washed sample contains gravel 50% sand 48% A to C, maj. gr. 1-1/2. pyrite 2%.
235	Drift - Similar to 230-235
239	Drift - gry unleached, unoxidized micae; IR contains silt 80% sand 20% A, maj. gr. 1/2-1/4
240	Drift - gry unleached, unoxidized, micae; IR contains silt 80% sand 20% A, maj. gr. 1-1/2. Glacial pebbles 5-15%
245	Drift - Similar to 240-245
249	Drift - gry unleached, unoxidized, micae; IR contains silt 80% sand 20% A, maj. gr. 1-1/2; washed sample contains gravel 50%, sand 48% A to C, maj. gr. 1/2-1/4,
253	Drift - gry, unleached, similar to 249-253
256	Drift - bf. and H. gry unleached, oxidized in part; IR contains silt 50% clay 30% sand 20% A maj. gr. 1-1/2
60	
261	Drift - bf. and H. gry unleached, oxidized in part; IR contains silt, 50% clay 30% sand 20% A maj. gr. 1/2-1/4
263	Drift - bf and H. gry unleached, oxidized micae; IR contains silt 20% clay 60% sand 20% A-2-1. Washed sample prin. gravel, very fls, brachs fusol. crinoid stems and a fish tooth see capsule
266	Drift - bf and H. gry. unleached, micae; washed sample principally gravel, very fls. fusulinids - see capsule
269	Drift - bf. grnb. unleached, oxidized micae fls crinoid stems, Glacial pebbles 10%
70	
272	Drift - gry unleached, unoxidized, micae; washed sample contains fusulinids (see capsule)
273	Drift - bf. unleached, oxidized in part; washed sample fls. crinoid stems fusulinids (see capsule)
274	AT Sh. 80-90% blk. carb. calc. 30-35% sol. Drift, 70-80% bf. unleached, oxidized
277	Sh. 95-100% blk and brown carb. calc. 30-35% sol; washed sample contains ls pebbles, shale frags; fls. fusulinids crinoid stems, corals, brachs etc
280	Sh. 97-100% blk carb. calc. 20-30% sol. massive;
282	Sh. 97-100% gry and blk carb calc 25-35% sol. massive fls. brachs. fusulinids
283	Sh. 97-100% gry calc 30-35% sol. massive;
284	Sh. 97-100% blk carb. calc. 30-35% sol. massive. fls. fusulinids
285	Sh. 97-100% gry calc. 25-35% sol. soapy. massive;
287	Sh. 97-100% gry calc. 25-30% sol. massive.
289	Sh. 97-100% gry calc 30-40% sol. blocky
90	
291	Sh. 97-100% gry calc. 30-40% sol. blocky micae;
293	Sh. 97-100% gry calc. 20-30% sol. blocky micae.
295	Sh. 97-100% similar to 293-295
297	Sh. 97-100% H. gry calc 30-40% sol. micae; fls-fusulinids; Pyrite 1-3%
300	

249
256

274

282

289

297

Location Lema, Iowa Date Drilled Dec. 1934 Analyst Talley

300	AI	LS	85-90% H. gry fine xline dense; Sh. 10-15% H. gry, calc
303			30-40% sol. micac
305	AI	Sh	80-90% H. gry calc. 30-40% sol. micac. blocky; LS. 10-20% H. gry. fine xline dense
307			20-40% similar to 303-305
309	AI	Sh	90-100% gry grth. calc. 30-40% sol. thinly laminated; LS. 1-10% bt. fine xline dense
310			Similar to 307-309
312			Sh. 90-100% gry. and dk. red, calc. 30-40% sol. micac.; LS. 1-10% bt. fine xline dense
314			Sh. 95-100% red, calc. 25-35% sol. blocky ferruginous; LS. 1-5% bt. fine xline dense
317			Sh. 95-100% red, calc. 25-35% sol. blocky ferruginous; LS. 1-4% bt. fine xline dense
319			Gypsum 1%.
320	AI	Sh	95-100% red and H. gry calc. 25-35% sol. ferruginous; LS. 1-5% bt. fine xline dense
322			Gypsum, tr.
323			Sh. 97-100% red calc. 20-30% sol. blocky ferruginous; LS. 1-3% bt. fine xline dense
324			Sh. 97-100% similar to 322-323
326	O	Sh	90-100% red and gry. grth. calc. 25-35% sol. thinly laminated, ferruginous; LS. 1-10% bt. fine xline dense. Pyrite, tr.
328	AI	Sh	95-100% H. gry. grth. and red, calc. 30-40% sol. micac, ferruginous; LS. 1-5% bt. fine xline dense.
330	AI	Sh	95-100% H. gry. grth. calc. 20-30% sol. micac, soapy, 1-3% bt. fine xline dense. Fls. bryozoan frags.
333			Sh. 95-100% similar to 328-333
334			Sh. 95-100% gry. calc. 20-30% sol. micac, soapy, LS. 1-5% bt. fine xline dense.
336			Pyrite, tr.
339	AI	Sh	Similar to 334-336
340			Sh. 97-100% gry calc. 20-30% sol. micac, soapy;
341			Sh. 97-100% gry calc. 25-35% sol. micac, soapy.
343			Sh. 97-100% gry calc. 25-35% sol. micac, soapy.
345			Sh. 97-100% gry calc. 25-35% sol. micac, pyrite 1-3%.
347	AI	Sh	97-100% gry and red, calc. 25-35% sol. micac.
350	AI	Sh	95-100% gry calc. 25-35% sol. micac; LS. 1-5% bt. fine xline dense.
353			Sh. 95-100% similar to 350-353
355			Sh. 97-100% gry calc. 25-35% sol. micac;
357			Sh. 97-100% similar to 355-357
359	AI	Sh	95-100% gry and red calc. 25-35% sol. micac; LS. gry med. xline, sandy micac. firm.
361			Sh. 95-100% similar to 359-361
364	AI	Sh	95-100% gry calc. 30-40% sol. micac; LS. 1-5% gry med. xline firm, sky.
366			Sh. 95-100% gry calc. 30-40% sol. micac; LS. 1-5% bt and gry med xline firm.
368			Sh. 95-100% gry calc. 30-40% sol. micac; LS. 1-5% gry med xline firm
370			Sh. 95-100% gry calc. 30-40% sol. micac; LS. 1-5% gry med xline firm
372			Sh. 95-100% gry. calc. 30-40% sol. micac; LS. 1-5% gry med xline firm.
377	AI	Sh	80-90% gry and red, calc. 30-40% sol. micac; LS. 10-20% gry, firm.
380			
382	AI	Sh	95-100% gry calc. 30-40% sol. micac; LS. 1-5% gry, med xline firm.
385			
387			Correction of depth
388			Sh. 95-100% gry calc. 20-30% sol. micac. blocky; LS. 1-5% gry med. xline, firm.
390	AI	Sh	80-90% gry and red, calc. 20-30% sol. micac. blocky; LS. 10-20% H. gry fine xline dense
392	AI	Sh	97-100% gry and bt. calc. 20-30% sol. micac. blocky; LS. 1-3% gry. fine xline dense.
394			Sh. similar to 390-392
396	AI	Sh	90-100% blk. calc. 30-40% sol. carb. blocky; LS. 1-10% gry med. xline firm
398	AI	Sh	95-100% gry calc. 30-40% sol. blocky; LS. 1-5% gry fine xline dense
400			

55.4%

55.9%

307

316

325

345

359

377

385

394

Location Lenox, Iowa Date Drilled Dec. 1934 Analyst Talley

400			
403	AI	Sh.	97-100% gry. and red calc. 30-40% sol. blocky;
	AI	Sh.	90-100% gry calc. 30-40% sol. blocky ls. 1-10% bt. fine xline dense
408			
10	AI	Sh.	90-100% gry and red calc 30-40% sol. blocky; ls. 1-10% bt. tolt. gry fine xline, dense. flts - crinoid stems
412			
413	AI	Sh.	97-100% H. gry. grnh calc. 30-40% sol., blocky
416		LS.	70-80% bt. fine xline dense; Sh. 20-30% gry calc 30-40% sol. blocky
417		LS.	70-80% bt. tolt. gry fine xline dense; Sh. 20-30% gry calc 30-40% sol. blocky
418			
20		LS.	70-80% H. gry fine xline dense; Sh. 20-30% gry calc. 30-40% sol. blocky
422 1/2			
422 3/4			
424	AI	Sh.	70-80% gry grnh. calc. 30-40% sol.; blocky; ls. 20-30% lt. gry. fine xline dense
426		Sh.	70-80% similar to 424-426
428			
30		Sh.	80-90% gry grnh. calc 30-40% sol. blocky; ls. 10-20% H. gry. fine xline dense
431		Sh.	80-90% gry grnh. calc 30-40% sol. blocky; ls. 10-20% H. gry. fine xline dense.
436			
440	AI	Sh.	95-100% gry calc. 25-35% sol. blocky; ls. 1-5% bt. fine xline dense
440	AI	LS.	70-80% H. gry fine xline dense; Sh. 20-30% gry calc 30-40% sol. blocky.
443		LS.	70-80% similar to 440-443
448			
50		LS.	70-80% H. gry fine xline, dense; Sh. 20-30% gry calc 30-40% sol. blocky.
451			
451			
454			
456	AI	Sh.	80-90% gry calc 30-40% sol. blocky; ls. 10-20% H. gry. fine xline, dense
459		Sh.	70-80% dk. gry. to blk. calc. 25-35% sol., carb. ls. 1-2% gry. fine xline, dense
60		Sh.	90-100% red, gry and blk. calc 25-35% sol. blocky; ls. 1-10% lt. gry. fine xline dense
462		LS.	80-90% bt. fine xline, dense; Sh. 10-20% gry grnh. calc 20-30% sol. blocky; ls. 1-5% bt. fine xline dense
464		Sh.	70-80% gry and red. calc. 25-35% sol.; ls. 1-5% H. gry. fine xline dense. flts - crinoid stems, bryozoans, gastropod see capsule, Gypsum, tr. Pyrite, tr. (Washed Sample?)
468		Sh.	95-100% dk. gry. to blk. calc. 30-40% sol. blocky ls. 1-5% bt. fine xline dense
469		Sh.	Similar to 468-469
470	AI	Sh.	97-100% gry. grnh. calc. 30-40% sol.; ls. 1-3% bt. fine xline dense.
473		Sh.	90-100% H. gry. calc 30-40% sol., friable; ls. 1-10% bt. fine xline, dense. Sand present - probably used as aid in drilling.
476			
478		Sh.	60-70% H. gry. grnh. calc 30-40% sol. friable, micac. ls. 30-40% bt. fine xline dense; sand present probably used as aid in drilling.
80	AI	Sh.	70-80% dk. gry. calc. 25-35% sol. blocky; ls. 20-30% bt. fine xline dense; sand present; flts. crinoid stems - brach. fragments Gypsum, tr.
481		Sh.	95-100% dk. gry. calc. 30-40% sol. blocky; ls. 1-5% bt. fine xline dense.
485			
486		Sh.	95-100% dk. gry. calc. 30-40% sol. blocky; ls. 1-5% bt. fine xline dense
490		Sh.	90-100% dk. gry. calc 30-40% sol. blocky; ls. 1-10% bt. fine xline dense.
492		Sh.	Similar to 488-490
494		Sh.	95-100% gry calc 30-40% sol. blocky; ls. 1-5% H. gry. fine xline dense; Gypsum, tr. flts. ostracod(?) see capsule
496	AI	Sh.	95-100% dk. gry. to blk. calc 30-40% sol.; ls. 1-5% H. gry. fine xline dense.
498			
499	AI	Sh.	97-100% dk. red, calc. 30-40% sol. blocky, ferruginous; ls. 1-3% H. gry. med xline, firm.
500		Sh.	97-100% dk. red and gry. grnh. calc 30-40% sol. blocky ferruginous.

Location Lenox Iowa Date Drilled Dec. 1934 Analyst Talley

500		Sh. 95-100% red and gray gran. calc. 30-40% sol. blocky; ls. 1-5% bt. fine xline dense.
502	AI	Sh. 95-100% red calc. 30-40% sol. blocky ferruginous; ls. 1-5% bt. fine xline dense
505		45-100% gray gran. calc. 30-40% sol. blocky; ls. 1-5% bt. fine xline dense.
506		Sh. 95-100% lt. gray. calc. 30-40% sol. friable; ls. 1-5% bt. med. xline sandy, saccharoidal.
507	AI	Sh. 95-100% gray calc. 30-40% sol. blocky, ls. 1-5% gray fine xline dense.
510	AI	Sh. 45-100% dk. gray calc. 30-40% sol. blocky. ls. 1-5% gray fine xline, dense.
515		Sh. 95-100% gray calc. 30-40% sol. blocky. ls. 1-5% lt. gray fine xline, dense
516 1/2	AI	Sh. 95-100% dk. gray to blk. calc. 30-40% sol. carb. & ls. 1-5% gray fine xline, dense
519		Sh. 95-100% dk. gray to blk. calc. 30-40% sol. carb. ls. 1-5% gray fine xline dense
520		fifs. crinoid stems, bryozoans, brachs. (brachs. crinoid stems)
521 1/2	AI	Sh. 95-100% gray calc. 30-40% sol. blocky; ls. 1-5% lt. gray fine xline, dense. fifs.
522	AI	Sh. 95-100% gray calc. 30-40% sol. blocky; ls. 1-5% lt. gray fine xline, dense; fifs. brachs
524	AI	Sh. 95-100% dk. gray gran. calc. 30-40% sol. ls. 2-10% bt. fine xline dense; fifs. crinoid stems.
528		Ls. 70-80% bt. fine xline dense; Sh. 20-30% grn. calc. 15-25% sol. blocky
30	AI	firm.
532		Ls. 80-90% bt. fine xline dense; Sh. 10-20% grn. calc. 15-25% sol. blocky.
534		Ls. 80-90% bt. fine xline dense; Sh. 10-20% grn. calc. 15-25% sol. blocky.
538	AI	Sh. 10-80% lt. gray calc. 25-35% sol. blocky; ls. 20-30% bt. to lt. gray fine xline, dense.
40		Sh. 90-100% lt. gray calc. 25-35% sol. friable; ls. 1-10% bt. fine xline, dense
541		fifs. crinoid stems.
543	AI	Sh. 95-100% gray calc. 30-40% sol. blocky; ls. 1-5% bt. fine xline dense
544		Sh. 95-100% blk. carb. calc. 25-35% sol. friable; ls. 1-5% bt. fine xline, dense.
546	AI	Sh. 90-100% gray calc. 30-40% sol. blocky; ls. 1-10% brown to gray. fine xline dense.
548	AI	Sh. similar to 546-548
550		Sh. 90-100% lt. gray calc. 30-40% sol., blocky; ls. 1-10% bt. to brown fine xline, dense.
553	25% sol.	Sh. 90-100% lt. gray calc. 30-40% sol. blocky; ls. 1-10% bt. to brown fine xline, dense. fifs. crinoid stems.
556	AI	Ls. 95-100% cream. fine xline dense; Shale 1% pyrite, 1% fifs. brach fragments, bryozoans, fusulinids (see capsule).
560		Ls. 95-100% similar to 556-560.
564		Ls. 80-90% cream. fine xline dense; Sh. 10-20% gray gran. calc. 30-40% sol. firm; pyrite, tr. fifs. crinoid stems.
566	AI	Sh. 80-90% dk. gray to blk. calc. 30-40% sol. blocky. ls. 10-20% bt. fine xline, dense.
567		Sh. 90-100% blk. carb. calc. 30-40% sol. blocky. ls. 1-10% bt. fine xline dense.
569	AI	Sh. 60-70% lt. gray calc. 30-40% sol. friable; ls. 30-40% lt. gray fine xline dense. fifs. crinoid stems.
570		Ls. 50-60% med. to dk. gray; friable; clay content - 30-40%; fossils abundant - Fusulina particularly; s.d. - 10-20%; Qtz, chiefly a & C; Pyrite common
572	AI	Sh. 95-100% gray; very calc. - 80-90% soluble; friable; some pyrite; ls. 5-10% like 576-579. Fusulina common.
576	AI	Ls. - 80-70%; impure; 1% to dk. gray; friable - easily broken; sh; clay content 30-40%; s.d. - 10-20%; a to C;
578	AI	sh; 70-80%; dk. gray to nearly blk; calcareous - 30-35% soluble; 25-20-30%; soft, sh; similar to 580 to 582.
580	AI	sh; 90-100%; dk. gray to nearly blk; carbonaceous; calc; 20-30% soluble; s.d. - 5-10%; med. - chiefly a & C; Pyrite present but not abundant, some dk. gray sh. mottling the blk;
582	AI	sh; 90-100% - similar to 586-589 - mottled with top gray sh - clay content - 5-10%;
586		sh - 80-90% dk. gray to nearly blk; calc; 20-30% soluble; carbonaceous; ls. - 10-20%; in thin bands or lenses in shale; s.d. - 15-20% - med. to a to C; Pyrite common
589		sh; 80-90% - dk. gray to nearly blk - similar to 591-593; Pyrite common or abundant
590		ls. - 5-10% - as in 591-593; some dk. gray ls. (591) s.d. 10-20%
591		sh - 80-90% - dk. gray to near. blk; mottled with 15-20% lt. gray sh; calcareous - 30-35% soluble; ls. frag. 10-20%; probably interbedded with sh; Pyrite common or abundant but not abundant; s.d. - 10-20%
593		sh - 80-90% - like 595-599. some ls. as in 595-599. (Two samples very much alike)
595		
599		
600		

505

516 1/2

528

538

544

546

556

566

572

(Talley T)

(Rowser)

631 $\frac{1}{2}$ - 636 - ls is two shades of gray - about $\frac{1}{3}$ is light gray - remaining $\frac{2}{3}$ is much darker gray - both slightly dolomitic; both contain 5-15% clay, included in ls. - darker part has larger amt of clay.

also clear, fresh Qtz. xls - 20390;
chert - 20390 - some dense, but most is rather porous - a in some cases blends into ls.

644-649 - ls is also fossiliferous - Fusulina and crinoid fragments - also minute pelecypods + gastropods.

Location Leno, Iowa

Date Drilled 1925 Analyst Talley

00		fls. - crinoid stems
707		Sh. 90-100% H. gry. calc. 20-30% sol. micae. blocky; ls. 1-10% bf. fine xline dense
708	AI	
709		Ls. 70-80% bf. to H. gry. fine xline dense; Sh. 10-20% H. gry. qn. calc. thinly laminated. qtz frags 1-10%
710	AI	
711		Ls. 85-100% H. gry. fine xline dense; Sh. 1-10% H. gry. qn. calc. 15-20% sol. thinly laminated. pyrite trace; fls. brach frags. crinoid stems, fusulina; qtz frags. 1-5% A,
715		Sh. 80-90% gry. calc. 20-30% sol. blocky; ls. 10-20% bf. fine xline dense; fls. crinoid stems, brachs. (see capsule)
718	AI	
719		Sh. 40-100% red and gry. calc. 25-35% sol. blocky; ls. 1-10% H. gry. med. line firm; fls. crinoid stems.
720	AI	
721		Sh. 80-90% red and gry. qn. calc. 25-35% sol. blocky; ls. 10-20% H. gry. med. line firm; fls. crinoid stems.
722		Sh. 90-100% med. gry. calc. 15-25% sol. blocky; ls. 1-10% bf. med. line firm; fls. crinoid stems.
723	AI	
724		Sh. 90-100% med. gry. calc. 15-25% sol. blocky; ls. 1-10% bf. fine xline dense; a few frags. qn. shale
726	AI	
728		Sh. 80-90% red and gry. calc. 20-30% sol. blocky; ls. 10-20% H. gry. med. line dense; a few fragments of qn. shale; fls. crinoid stems, bryozoa.
730	AI	
731 1/2		Sh. 80-90% gry. calc. 10-20% sol. blocky; ls. 1-10% gry. med. line firm; 16% Sol
733 1/2	AI	
737		Sh. 90-100% red and gry. calc. 15-25% sol. blocky. smooth, ferruginous; ls. 1-10% bf. to H. gry. fine xline dense; fls. crinoid stems.
739	AI	
740		Sh. 90-100% H. gry. red and gry. calc. 15-25% sol. blocky; ls. 1-10% H. gry. fine xline dense; fls. crinoid stems; qtz frags. and pyrite, tr.
740	AI	
741		Sh. 80-90% gry. calc. 15-25% sol. blocky; ls. 10-20% H. gry. med. line firm;
743	AI	
746		Sh. 90-100% H. gry. qn. calc. 5-10% sol. blocky. micae; ls. 1-10% bf. fine xline dense.
750		Sh. 90-100% H. gry. qn. calc. 5-10% sol. blocky. micae; ls. 1-10% bf. and H. gry. fine xline dense; qtz frags. 1-3% A; fls. crinoid stems, bryozoa, fusulina.
754		Sh. 90-100% H. gry. qn. calc. 10-15% sol. blocky, micae; ls. 1-10% bf. fine xline dense; pyrite, tr.
751		Sh. 90-100% H. gry. qn. calc. 15-20% sol. blocky firm; micae; ls. 1-20% gry. med. line firm; fls. crinoid stems; qtz frags. 1-3% A.
760	AI	
762		Sh. 40-100% H. gry. med. rdh. calc. 15-20% sol. blocky, micae; ls. 1-10% gry. med. xline firm;
766	AI	
768		Sh. 90-100% H. gry. calc. 15-20% sol. blocky firm; ls. 1-10% H. gry. fine xline dense; fls. crinoid stems.
770		Sh. 90-100% H. gry. calc. 15-20% sol. blocky firm; ls. 1-10% H. gry. fine xline dense; fls. crinoid stems.
772		Sh. 90-100% H. gry. calc. 15-20% sol. blocky firm; ls. 1-10% H. gry. fine xline dense; fls. crinoid stems.
773	AI	
776		Sh. 90-100% H. gry. calc. 15-20% sol. blocky firm; ls. 1-10% H. gry. med. line firm; fls. crinoid stems.
778	AI	
780		Sh. 90-100% H. gry. calc. 20-30% sol. blocky firm; ls. 1-10% bf. fine xline dense.
781	AI	
785		Sh. 90-100% dk red and gry. qn. calc. 20-25% sol; ls. bf. fine xline dense; fls. crinoid stems.
788	AI	
790		Ls. 70-80% bf. fine xline dense; Sh. 10-20% qn. calc. 10-15% sol. ferr. ls. qtz sands, 1-10% A, major 1/2" H. prin. sub. 1/8"; pyrite, tr. fls. crinoid stems, bryozoa, gastropod, cephalopod (see capsule).
795	AI	
799		Sh. 80-100% H. gry. calc. 15-20% sol. blocky, micae; ls. 1-3% bf. fine xline dense.
800	AI	
801		Sh. 85-100% gry. to dk. brown calc. 25-30% sol; ls. 1-15% gry. med. line firm; pyrite, tr.

(Fragmental)

716
718
722
726

to here

3

80

801

Location Lenox Town Date Drilled 1935 Analyst Talley

800	AI	Sh. 95-100% gry. calc. 20-30% sol. blocky, micac; ls. 1-5% gry. fine xline dense, pyrite, tr.
804	AI	Sh. 95-100% gry. grnh. calc. 20-30% sol. blocky; ls. 1-5% gry. fine xline dense.
806		Sh. 90-100% red and gry. calc. 20-25% sol. blocky; ls. 1-10% bf. fine xline dense; flts. crinoid stems; pyrite, tr.
807 1/2		Sh. 90-100% red, gry. bf. gry. calc. 20-25% sol. blocky; ls. 1-10% gry. fine xline dense; flts. crinoid stems.
810	AI	Sh. 97-100% lt. gry. calc. 20-25% sol. blocky; ls. 1-10% bf. fine xline dense; flts. fusulina (?).
813		Sh. 90-100% gry. grnh. calc. 20-25% sol. blocky; ls. 1-10% bf. to lt. gry. fine xline dense; flts. crinoid stems, brachiopod, bryozoa, pyrite, tr.
815 1/2	AI	Sh. 80-90% dk. red and gry. grnh. calc. 20-25% sol. blocky, micac; ls. 10-20% bf. to lt. gry. fine xline dense. flts. crinoid stems, brachiopods, bryozoa, gastropod (see capsule).
819		Sh. 80-90% dk. red and gry. calc. 20-30% sol. blocky, micac; ls. 10-20% bf. fine xline dense.
20		Sh. 90-100% dk. red. and gry. calc. 20-30% sol. blocky, micac; ls. 1-10% bf. to lt. gry. fine xline dense; flts. crinoid stems, brachiopods, bryozoa, gastropod (see capsule).
823		Sh. 90-100% dk. red. and gry. calc. 20-30% sol. blocky, micac; ls. 1-10% bf. to lt. gry. fine xline dense; flts. crinoid stems, brachiopods, bryozoa, gastropod (see capsule).
825	AI	Sh. 70-80% lt. gry. calc. 20-30% sol. blocky, micac; Sand 10-20% A to a, med. gr. 1/4-1/2, prin. sub. 1/4-1/2, ls. 1-10% gry. fine xline dense.
829		Sh. 90-100% dk. gry. to blk. calc. 20-30% sol. blocky, carb; ls. bf. to lt. gry. fine xline, dense.
30	AI	Sh. 90-100% dk. gry. to blk. calc. 20-30% sol. blocky, carb; ls. 1-10% bf. fine xline dense. (13.9% Sol)
832		Sh. 90-100% dk. gry. to blk. calc. 20-30% sol. blocky, carb; ls. 1-10% bf. fine xline dense.
835	AI	Sh. 90-100% lt. gry. calc. 20-30% sol. blocky, micac; ls. 1-10% gry. fine xline dense. (47% Sol)
840		Sh. 90-100% lt. gry. calc. 20-30% sol. blocky, micac; ls. 1-10% bf. fine xline dense; flts. crinoid stems, brachiopod frags.
Darbyville 842	AI	Ls. 80-90% bf. med. xline, saccharoidal; sh. 10-15 dk. gry. to blk. carb. thinly laminated, pyrite tr. qtz frags. 1-5% A. Sample labeled "Washed from 1st bailer"; - No other sample available.
847	AI	Sh. 90-100% lt. gry. calc. 20-30% sol. blocky, micac; ls. 1-10% bf. fine xline, dense.
50		Sh. 97-100% olive green calc. 20-30% sol. smooth, massive; ls. 1-3% bf. fine xline dense. (13% Sol)
851	AI	Sh. 97-100% olive green calc. 20-30% sol. smooth, massive; ls. 1-3% bf. fine xline dense.
855	AI	Sh. 97-100% gry. grnh. calc. 20-30% sol. smooth, massive, micac; ls. 1-3% gry. med. xline dense; often frags. of blk. shale.
859 1/2		Sh. 97-100% gry. calc. 20-30% sol. smooth; ls. 1-3% bf. fine xline, dense.
60		Sh. 60-70% gry. grnh. calc. 20-30% sol. firm, blocky; ls. 30-40% bf. med. xline saccharoidal, flts. crinoid stems.
863		Sh. 60-70% gry. grnh. calc. 20-30% sol. firm, blocky; ls. 30-40% bf. med. xline saccharoidal, flts. crinoid stems.
868		Sh. 97-100% gry. calc. 20-30% sol. firm, massive, micac; ls. 1-3% gry. fine xline, dense.
70	AI	Sh. 97-100% gry. calc. 20-30% sol. firm, massive, micac; ls. 1-3% gry. fine xline, dense.
872		Sh. 97-100% gry. calc. 20-30% sol. firm, massive, micac; ls. 1-3% bf. fine xline dense; flts. crinoid stems; pyrite, some dendroid, tr.
874		Sh. 97-100% gry. calc. 20-30% sol. firm, massive; ls. 1-5% bf. fine xline dense; flts. crinoid stems, bryozoa;
879		Sh. 97-100% gry. calc. 20-30% sol. friable; qtz frags. A to C, 1-2%; flts. crinoid stems.
80	omit	Sh. 97-100% gry. calc. 20-30% sol. friable; qtz frags. A to C, 1-2%; flts. crinoid stems.
883		Sh. 97-100% lt. gry. calc. 3-5% sol. friable; often frags. dk. gr. sh.
886		Sh. 97-100% red. gry. calc. 3-5% sol. friable, micac; flts. crinoid stems.
888		Sh. 95-100% red and gry. calc. 5-10% sol. friable, micac; ls. 1-5% bf. fine xline, dense.
889		Sh. 95-100% red and gry. calc. 5-10% sol. blocky, micac; ls. 1-5% gry. fine xline, dense.
90		Sh. 95-100% red and gry. calc. 5-10% sol. blocky, micac; ls. 1-5% gry. fine xline, dense.
891		Sh. 95-100% red and gry. calc. 5-10% sol. blocky, micac; ls. 1-5% gry. fine xline, dense.
894	AI	Sh. 95-100% lt. gry. calc. 20-30% sol. blocky, micac; ls. 1-5% lt. gry. fine xline, dense.
898		Sh. Similar to 894-898
00		Sh. Similar to 894-898

Location Lenox, Iowa

Date Drilled 1925 Analyst T. H. G. & R. W. S. (911-911) (911-924) 984-1000

248

900
901
906
10
911
915
920
925
930
931 1/2
936
940
Brazil
945
947
950
951
956
960
964
967
70
972
976
977
979 1/2
980
981
982 1/2
984
985
989 1/2
90
992
994 1/2
997
00

Sh. 97-100% gry calc. 10-20% sol. blocky, micac; ls. 1-3% gry fine xline dense

Sh. 97-100% gry. calc 20-30% sol. friable, micac;

AI Sh. 98-100% - 1st. gry; slightly calc. - 10-15% soluble - micaceous; contains 10% of blk, lignitic shale.

Sh. 60-70% - 1st. gry - similar to 911-915 - LS - 20-30% - fossiliferous; crinoid stems & brach. spines; soft - 9 rays; sand - 5-10% - fine, carbonaceous material - 4-5% - resembles coal; Pyrite very abundant

AI Sh. 97-100% gry - calc - 20-30% soluble - very micaceous; more or less massive; silt content 30-40% (16.3% Sol)

Sh. 97-100% gry - calc - similar to 920-925 - silt content 10-20% (20-30%)

Shale - gry - calc - 10-20% sol. very micaceous; silt content 5-10%

AI Shale - drk gry to nearly blk; fissil; micaceous, calc - 15-25% soluble; micac; shale like 930-931 1/2 - 10-15% pyrite abundant

Shale - drk gry - similar to 931 1/2 - 936 - 20-30% soluble,

Shale - 70-75% - 1st gry - calc - 10-20% soluble; micaceous LS - 25-30% - buff to gry - rather impure; Pyrite common. (Quoted sample nearly 100% ls.)

Shale - 60-70% - similar to 940-945 LS - 30-40% gry - fossiliferous; crinoid & brach frags; pyrite abundant; washed sam ple 70-80% LS & 20-30% sh.

AI Sh. 90-100% blk carb. slightly calc. Thinly laminated; ls 1-2% bt fine xline dense.

Shale - 60-70% - drk gry to nearly black; fissil; calcareous; 20-30% soluble; is interbedded with 1st gry s/s - which makes up 30-40% of the sample mica common;

Shale - 60-70% - similar to 951-956. s/s - 30-40%

Shale - 70-80% - drk. gry to nearly blk - veeping on coal in part; calcareous 10-20% sol. carbonaceous; fissil; s/s - 20-30% - 1st gry; interbedded with shale. Mica and pyrite common.

WS SS - 60-70% - drk gry; fine - 1/2 - 1/4 - med. and fine sub. - 1/4 - 1/4 A + a; s/s - 10-20% sh - 10-20% - similar to 960-967 Mica abundant - solubility of sample 10-30% (21.5% Sol)

AI Sh. 60-70% med. gry. color; calcareous - 20-25% sol; very micaceous; silt content 10-20%; sand - 5-10% - similar to that in 964-967.

Shale - 80-90% - similar to that in 967-970; silt content 10-20%; solubility 15-20%.

AI Shale - brown - gry to reddish gry; calcareous - 20-25% soluble; very micaceous; fissil; silt content 20-30%;

Shale - similar to 976-978; silt content 20-30%

AI Shale - drk. gry to med. gry; fissil; micaceous; about 1/2 ls carbonaceous; calcareous; 20-30% soluble; silt content 40-50%

AI Shale - drk. gry; calcareous & 70% soluble; micaceous; fissil; some pyrite; silt content 25-35%; some very finely cemented.

Shale - drk. gry; calcareous - very similar to 981-982 1/2; silt - 10-20% - as in 981-982 1/2; pyrite common;

Shale - med. gry - calc. 20-30% soluble; micaceous; Pyrite very abundant.

Shale 90-100% lt gry grn. calc. 15-20% sol. friable, micac; ls. 1-10% lt gry fine xline dense.

Sh. 90-100% bt. calc. 20% sol. micac, friable; ls. 1-10% lt gry, fine xline dense a few concretionary masses of pyrite; fts. brach frags and crinoid stems. pyrite tr.

Sh. 90-100% lt gry, calc 15-20% sol. friable; ls. 1-10% lt gry fine xline dense; pyrite abundant.

Sh. 75-85% dr. red. to lt gry calc. 15-20% friable; ls. 10-20% bt. to lt gry fine xline dense; pyrite 1-5% in xline masses; fts - Crinoid stems

Sh. 90-100% lt gry calc. 10-20% sol.

1002

Location Lenax, Iowa

Date Drilled 1935

Analyst Talley

00	997	90-100% lt. gry calc. 15-20% sol. friable; ls. 1-8% bt. to lt. gry. fine xline dense; H. pyrite concretions 12%
1007		
10		90-100% lt. gry calc. 15-20% sol. friable; ls. 1-10% bt. fine xline dense; flts. crinoid stems bryozoa.
1011		Sh. 90-100% lt. gry. calc. 15-20% sol. friable, micac. ls. 1-10% bt. fine xline dense; flts. crinoid stems.
1014		Sh. 97-100% lt. gry. calc. 5-10% sol. friable, micac.
1017		Sh. 90-100% gry calc. 10-15% sol. soft, unctuous; ls. 1-10% lt. gry. fine xline dense;
1020		Sh. 90-100% dk. gry. calc. 5-10% sol. soft unctuous; ls. 1-10% bt. med. xline, firm.
1022		Sh. 90-100% dk. gry. calc. 5-10% sol. soft, unctuous micac; ls. 1-10% lt. gry. fine xline dense.
1026		Sh. 90-100% dk. gry. calc. 10-15% sol. soft, unctuous, micac; ls. 1-10% lt. gry. fine xline dense.
1029		Sh. 90-100% dk. gry. calc. 15-20% sol. soft, micac; ls. 1-10% bt. to lt. gry. fine xline, dense; flts. crinoid stems; pyrite, 1%
30	AI	Sh. 80-90% gry calc. 15-25% sol. soft, micac; ls. 10-20% bt. to lt. gry. fine xline, dense; flts. crinoid stems
1033		Sh. 80-90% gry calc. 15-25% sol. soft, micac; ls. 10-20% bt. to lt. gry. fine xline, dense; flts. crinoid stems
1037		Sh. 80-90% gry calc. 15-25% sol. soft micac; ls. 10-20% bt. to lt. gry. fine xline, dense; flts. crinoid stems
40		Sh. 90-100% lt. to med. gry. calc. 15-25% sol. micac; ls. 1-10% lt. gry. fine xline, dense.
1045		Sh. 95-100% lt. gry calc. 15-25% sol. soft, micac; containing thin seams of blk. carb. material; ls. 1-5% lt. gry. fine xline dense; flts. crinoid stems.
50	AI	Sh. 95-100% mottled, red. gry. brwn. calc. 15-20% sol. soft, micac; ls. 1-5% bt. fine xline, dense; (Sample 24/9 Sol)
1054		Sh. 95-100% mottled red. gry. brwn. blk. calc. 15-20% sol. soft, micac; ls. 1-5% bt. fine xline dense.
1055		Sh. 95-100% mottled similar to 1054-1053; flts. - crinoid stems
1056		Sh. 95-100% mottled red. gry. brwn. calc. 10-15% sol. soft, micac; ls. 1-5% lt. gry. fine xline, dense; flts. crinoid stems
1058		Sh. 95-100% dk. gry. to blk. in part carb., calc. 15-20% sol. soft micac; ls. 1-5% lt. gry. fine xline dense.
60	AI	Sh. 95-100% mottled red. gry. brwn. calc. 15-20% sol. soft, micac; ls. 10-15% bt. to lt. gry. fine xline dense; flts. crinoid stems
1062		Sh. 90-100% dk. gry. calc. 3-5% sol. soft, micac; ls. 5-8% bt. to lt. brwn. fine xline dense; pyrite 1-2%; a few iron concretions, probably hematite.
1066		Sh. 95-100% H. gry. calc. 3-5% sol. soft, micac. sh. 1-3% blk. carb. hard, thin, laminated; pyrite abundant; flts. crinoid stems, brach. frags. and spines.
70		(37% Sol)
1071		Sh. 95-100% med. gry. in part dk. red. with thin seams of carbonaceous material; soft, friable, micac; ls. 1-5% brn. fine xline, dense; washed sample contains sand, AtoC, may gr. 1/2-1/4 prin. sub. 1/2-1/4
1076		Sh. 97-100% lt. gry. calc. 3-5% sol., with small frags. and thin seams of blk. carb. material; micac., silty; washed sample contains sand AtoC, may gr. 1/2-1/4 prin. sub. 1/2-1/4
80	IR	Sh. 97-100% H. gry. in part grn. non calc. micac. silty; washed sample contains sand, AtoC, may gr. 1/2-1/4 prin. sub. 1/2-1/4
1082		Sls. 95-100% H. gry. calc. 1-2% sol. firm, soapy; few frags. brwn. sh.; washed sample contains sand, AtoC, may gr. 1/2-1/4 prin. sub. 1/2-1/4
1085		Sh. 95-100% dk. gry. to nearly blk. non calc. firm; ls. 1-5% H. gry. fine xline, dense; a few frags. sls. from above
1089		Sh. 95-100% dk. gry. non calc. firm, silty; ls. 1-5% H. gry. fine xline, dense; a few frags. of red. brwn. sh. (Sample 1570 Sol)
90	IR	Sh. 97-100% dk. gry. non calc. firm, micac; a few frags. of red. brwn. sh. (10-15% Sol)
1092 1/2		Sh. 97-100% dk. gry. non calc. firm, micac; a few frags. of red. brwn. sh. (Sample 3319 Sol)
1097		Sls. 95-100% H. gry. non calc. friable sandy, few frags. of green and brwn. sh. (probably carved); washed sample contains sand AtoC may gr. 1/2-1/4 prin. sub. 1-1/2
1102		

Iolux AI

AI

AI

AI

Omit

IR

IR

IR

IR

IR

IR

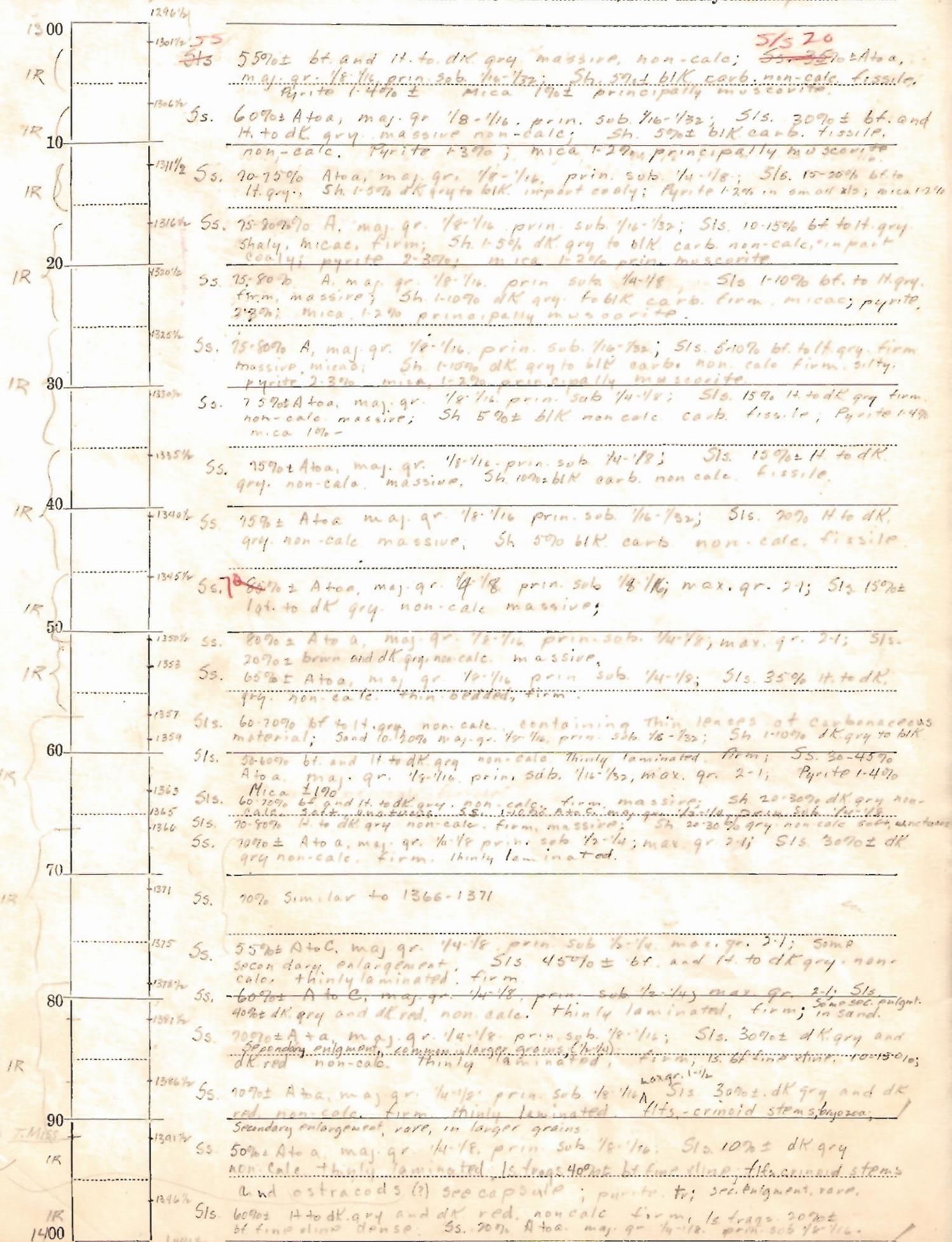
Location Lenox, Iowa Date Drilled 1935 Analyst Talley & Piper

12 00	1200 1/2	SS. 60%± Atoa, maj. gr. 1/8-1/16, prin. sub. 1/4-1/8; Sls. 30%± 1qt. to dk gry non calc. massive; Sh 10% blk carb. non-calc. fissile.
IR	1201 1/2	SS. 25%± Atoa, maj. gr. 1/8-1/16, prin. sub. 1/16-1/32; Sls. 15%± 1qt. to dk gry. massive, non-calc.
WS	1202 1/2	SS. 60-70% Atoa, maj. gr. 1/8-1/16, prin. sub. 1/8-1/16; Sh. 30-35% H to dk gry. massive, non-calc. silty; Pyrite 1.3%, mica 1.2%.
10	1211 1/2	SS. 60%± Atoa, maj. gr. 1/8-1/16, prin. sub. 1/4-1/8; Sls. 30% H to dk gry massive, non-calc; Sh. 5%± blk carb fissile, non-calc. Pyrite 1.3% mica 1.2%.
IR	1216 1/2	SS. 90%± Atoa maj. gr. 1/8-1/16, prin. sub. 1/4-1/8; Sls. 10%± H to dk gry. massive, non-calc.
WS	1221 1/2	SS. 60%± maj. gr. 1/8-1/16, prin. sub. 1/4-1/8. Atoa; Sh. 20%± blk carb non calc. fissile; Sls 15%± H to dk gry; massive, non-calc. Pyrite 1.3%, mica 1.2%.
IR	1226 1/2	SS. ± 95% Atoa, maj. gr. 1/8-1/16, prin. sub. 1/4-1/8; Sls. 20%± H to dk gry non calc; Sh 5%± blk carb non-calc fissile; Pyrite 1.3% Mica 2.6%.
IR	1231 1/2	SS. 60%± Atoa, maj. gr. 1/8-1/16, prin. sub. 1/4-1/8; Sh 20%± blk carb, fissile, in part coaly; Sls. 15%± H to dk gry. massive non-calc. Pyrite 1.3%, mica 1.2%.
40	1235 1/2	SS. ± 60% Atoa, maj. gr. 1/8-1/16, prin. sub. 1/4-1/8; Sls ± 30% H to dk gry. massive, non-calc; Sh 10% blk carb. fissile.
IR	1240 1/2	SS. 60-70% Atoa, maj. gr. 1/8-1/16, prin. sub. 1/4-1/8; Sh. 30-37% dk gry to blk, non-calc. massive, silty; Pyrite 1.3% 5%.
IR	1245 1/2	Sls 50-60% dk gry to blk. non calc. firm massive; Sg. 30-40% Atoa, maj. gr. 1/8-1/16, prin. sub. 1/4-1/8; Sh 5-10% blk to brwn. firm massive, non-calc.
50	1250 1/2	SS. ± 60% Atoa, maj. gr. 1/8-1/16, prin. sub. 1/4-1/8; Sls. 30% H to dk gry. massive, non-calc; Sh 7% blk carb. non-calc. fissile. Pyrite ± 3%.
IR	1255 1/2	SS. ± 40% Atoa, maj. gr. 1/8-1/16, prin. sub. 1/16-1/32; Sls. ± 20% H to dk gry, massive; Sh 1.5% blk carb. fissile.
60	1259 1/2	SS. 60-70% oligocr. and H. to dk gry. non-calc. firm; Ss. 20-30% Atoa, maj. gr. 1/8-1/16, prin. sub. 1/8-1/16; Sh. 1-5% blk carb. non-calc. fissile; Pyrite 1.3%, mica 1.2%.
IR	1263 1/2	SS. 40%± Atoa, maj. gr. 1/8-1/16, prin. sub. 1/16-1/32; Sls. 25%± H to dk gry. non-calc. firm; Sh. and coal frags. 1-5% blk. massive; Pyrite 1.5%.
IR	1268 1/2	SS. ± 40% H. to dk gry non calc massive; Ss. ± 30% Atoa maj. gr. 1/8-1/16 prin. sub. 1/4-1/8; Pyrite ± 2%.
70	1273 1/2	SS. 70-80% Atoa, maj. gr. 1/8-1/16, prin. sub. 1/16-1/32; Sls. 15-20% H to dk gry. non-calc. massive Coal 1.5%; Pyrite 1.3% mica 1.2%.
WS	1277 1/2	Sh. 80-90%; practically insoluble; med. gry; massive; 15-20% silt, <1% mica; <1% pyrite.
IR	1281 1/2	Ss. 70-80% Atoa, maj. gr. 1/8-1/16, prin. sub. 1/4-1/8. Sls. 10-20% H to dk gry. non-calc. massive; Sh. 1-5% blk carb fissile; Pyrite 1.3%, mica 1.2%.
IR	1284 1/2	SS. 70-80% Atoa, maj. gr. 1/8-1/16, prin. sub. 1/4-1/8; Sls. 10-20% blk to lt. gry. non-calc.; Sh. 1-5% blk carb. fissile; pyrite 1.3% mica 1.2%.
WS	1288	SS. 20-80% Atoa, maj. gr. 1/8-1/16, prin. sub. 1/4-1/8; Sls 10-20% H to dk gry. non-calc. firm massive; Sh. 1-5% blk. fissile carb; pyrite 1.3% mica 1.2%.
90	1292 1/2	SS. 70-80% Atoa, maj. gr. 1/8-1/16, prin. sub. 1/16-1/32; Sls. 10-20% H to dk gry. non calc. massive. Sh. 1-7% blk carb. non-calc. Pyrite 1.3%.
WS	1296 1/2	Sls. 5-10% H to dk gry. massive, non-calc; Ss. 30-35% Atoa, maj. gr. 1/8-1/16, prin. sub. 1/16-1/32, pyrite 1.2%; mica 1.2%.
1300		

Location Lenex, Iowa

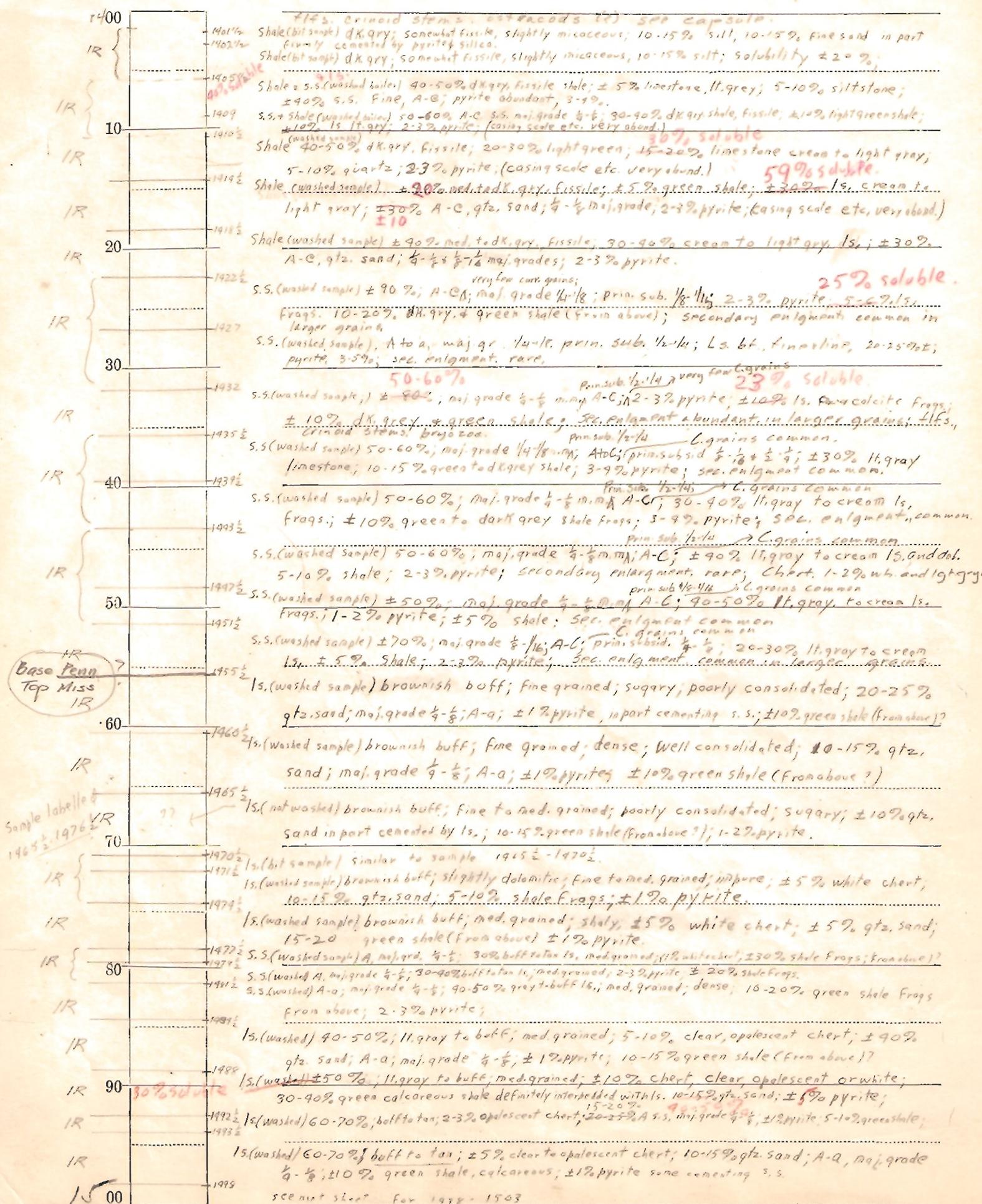
Date Drilled 1925

Analyst Talley



T. Miller
 Geologist
 U.S. Geological Survey

Location LORAN IOWA Date Drilled 1935 Analyst Page



Base Penn Top Miss IR

Sample labels 1465 1/2-1476 1/2

Location Lenox, Iowa Date Drilled 1935 Analyst Talley

15	00	IR	Ls. (washed) 70-80% white to brown; mottled; med. grained; compact; 15-20% chert, clear, opalescent, or white; 2-3% qtz; ± 1% pyrite; 2-3% green shale from above.
	1503 1/2		Ls. (washed) 70% cream to bf. med to fine xline firm; Chert 25% wh. to lgt. bf. and lgt. gry; in part oolitic; Sand, 4%±; Pyrite 1%±; Grn. sh. caving; flts. - fragments, of forams (?), spiracles etc.
	1508 1/2	IR	Ls. (washed) 70% + lgt. to dk. brown med to fine xline firm; Chert 25%± lgt. gry. to blk., Sand 3%±; Pyrite 2%±; Grn. sh. caving; flts. - crinoid stems, apicules, (forams ??)
	1513		Ls. (washed) 85%± med to dk. brown med to fine xline dense; Chert 8%± wh. to lgt. gry; Sand 8%± A. fine; flts. approx. 50% of sample consists of frags. of bryozoa, crinoid stems, brachs, (see capsule spiracles, (forams ??); pyrite 5%±
	1518	IR	Ls. 80%± lgt. to dk. brown med to fine xline dense; Chert 10%± wh. to lgt. gry. Sand 8%± A. fine; Pyrite 5%±, anhedral masses; flts., brach frags bryozoa, crinoid stems, forams (??)
	1522	IR	Ls. 40%± bf. to med brown med to fine xline dense, finely comminuted by drill; Chert 5%± wh. to blk. Sand 4%± A. fine; flts. bryozoa, brachs, frags crinoid stems, pyrite 1%±
	1526	IR	Ls. 70%± bf to med brown med xline shaly; Shale 25% lgt. gry. calc. 15-20% sol. unctuous; pyrite 1%±; Sand, 4%± A. fine; flts. crinoid stems, bryozoa, brach frags.
	1530 1/2	IR	Ls. 60%± bf to dk. brown med to fine xline dense; Shale, 15%± lgt. gry. calc. 20-30% sol. unctuous, silty, may be caving; Chert, 30%± wh., clear, and dk. brown. Some euhedral qtz. xtls; pyrite, tr; Sand 15%± A. med to fine; flts. - bryozoa, brachs, frags crinoid stems
	1535 1/2	IR	Ls. 85%± lgt. to med. brown med to fine xline dense; Chert, 10%± wh. to dk. brown. Sand 4%± A. fine; pyrite 1%±; euhedral qtz. xtls. flts. - similar to 1530 1/2-1535 1/2
	1537 1/2	IR	Ls. 80%± dolomitic. bf to dk. brown med xline granular; Chert, 15%± wh. to dk. brown, mottled; Sand, 4%± A. fine; pyrite 1%±; Grn. sh. and gry sh. caving. flts. - large frags. of bryozoa, crinoid stems.
	1541 1/2	IR	Ls. 80%± bf to med brown med xline granular; Chert 15%± wh. to lgt. brown, mottled; Sand 4%± A. med; pyrite, 1%±; Gry sh. caving; flts. - brach frags. crinoid stems, bryozoa, spiracles, bryozoa
	1545 1/2	IR	Ls. 25%± soluble 25%± lgt. to dk. brown med. xline granular; Chert 10%± wh. to dk. brown, mottled; Sand, 9%± A. med. gry 1/2-1/4. prin. sub. 1/8; pyrite 1%±; euhedral qtz. xtls; flts. - bryozoa, brach frags, crinoid stems; Grn and gry sh. caving
	1550 1/2	IR	Ls. 70%± lgt. to dk. brown med. xline granular; Chert, 15%± wh. to dk. brown, mottled; Sand, 12%± A. fine; pyrite, 1%±; flts. crinoid stems, bryozoa; Grn and gry sh. caving
	1555 1/2	IR	Ls. 60%± bf to lgt. brown med xline granular; Chert 35%± wh. to lgt. brown, mottled, flts; Sand, 5%± A. fine; pyrite, tr; flts. bryozoa, crinoid stems. 35%±
	1557 1/2	IR	Ls. 50%± soluble 50%± bf to lgt. brown med. xline granular, finely comminuted by drill; Chert, 10%± wh. to bf. mottled; Sand 5%± A. fine; flts. bryozoa, Grn sh. caving
	1561 1/2	IR	Ls. 80%± lgt. to dk. brown, med. xline granular; Chert, 15%± wh. to lgt. brown, mottled, flts. Sand, 5%± A. fine; flts. crinoid stems, bryozoa; Grn sh. caving euhedral qtz. xtls; Glauconite in large frags. 90%±
	1565 1/2	IR	Ls. 46%± soluble 20%± med to dk. brown med. xline granular; Chert 25%± wh. to lgt. brown, mottled, flts; Sand, 4%± A. fine; euhedral qtz. xtls; flts. - bryozoa, crinoid stems, brach frags. Grn. and gry sh. caving. Glauconite
	1569 1/2	IR	Ls. similar to 1565 1/2-1569 1/2 - Glauconite present
	1571 1/2	IR	Ls. gry to gry-brown med to fine grained, earthy texture; zones argillaceous, very flts. very thin beds; approx. 50%± Chert, 15%± wh. and chert, gry milky, with med. blk. organic matter in underbeds; fossils, underlaminated, 45-50%± drusy qtz and calcite 5%±; all very flts; 1-2%± euhedral pyrite, tr, Sand absent; few bryozoa.
	1575	IR	Ls. and chert: 15. gry to brown and dk. brown 60-65%±; chert milky to gry and at 25%±; Ls. med coarse to coarse xline; Chert dense to argillaceous. all very flts; drusy qtz and calcite common; bryozoa very abundant, brachs (arr)
	1578 1/2	IR	Ls. and chert similar to 1575-1578; argillaceous, pyrite, tr, drusy calcite and quartz very flts. - bryozoa + brachs.
	1581 1/2	IR	Ls. and chert: Ls 75%±, chert 25% - similar to above - very flts. glauc.
	1584 1/2	IR	Ls. 80%± chert gry to milky 15%±; fresh pyrite; flts. fresh glauc.
	1587 1/2	IR	Ls. 80%± bf. med xline firm; chert 20%± wh. milky, and blk. and wh. mottled; flts, pyrite, glauconite;
	1589 1/2	IR	Ls. similar to 1587 1/2-1589 1/2 - gry sh. caving
	1591 1/2	IR	Ls. 80%± bf. med xline firm; chert, 10%± wh. milky and blk. and wh. mottled, flts. bryozoa, crinoid stems; pyrite, glauconite; gry sh. caving
	1594 1/2	IR	Ls. 80%± cream to bf. med. xline; Chert, 19%± wh. milky, and blk. and wh. mottled; flts. bryozoa, crinoid stems; pyrite, 1%±; glauconite, tr;
	1597 1/2	IR	Ls. 80%± cream to bf. med xline soft; chert, 20%± wh. and milky; flts. bryozoa, crinoid stems, bryozoa, tr;
	1600	IR	Ls. 80%± cream to bf. med xline soft; chert, 20%± wh. and milky; flts. bryozoa, crinoid stems, bryozoa, tr;

70% soluble
16

1698
1699
1700

1697
1698
1699

1575-1578^{1/2} Glauconite present; pyrite >10%; little or no sand; Coring in sig.

Location Lenox, Iowa Date Drilled May, 1935 Analyst Talley

AI	1600	Ls. 70%± lgt. bt. to lgt. gry. med. xline, granular; Chert 30%± wh., milky, and lgt. gry. mottled; flts. bryozoa, crinoid stems
	1602 1/2	Ls. 80% lgt. bt. to lat. gry. med. to fine xline firm; Chert 20%± wh., milky, mottled; flts. bryozoa, crinoid stems
	1605 1/2	Ls. 85%± lgt. bt. to lgt. gry. med. to fine xline, firm; Chert 15%± wh. and milky, mottled; flts. crinoid stems
AI	10	1608 1/2 Ls. 85% lgt. bt. to lat. gry. med. to fine xline firm; Chert 15%± wh. and milky; glauconite, tr.; flts. bryozoa, crinoid stems
	1611 1/2	Ls. 75% lgt. gry. med. to fine xline firm; Chert 25%± milky and wh., mottled; flts. crinoid stems, bryozoa
	1615 1/2	Ls. 85%± lgt. gry. med. to fine xline, firm; Chert 15%± milky and wh., mottled; glauconite, tr.; flts. bryozoa, crinoid stems
AI	20	1620 Ls. 85%± lgt. gry. med. xline, firm; Chert 15%± wh. and milky; pyrite, tr.; flts. bryozoa, crinoid stems
	1625	Ls. 80%± lgt. gry. med. xline firm; Chert 20%± wh. and milky; pyrite, tr.; flts. bryozoa, crinoid stems
AI	30	1630 Ls. Similar to 1625-1630
	1633	Ls. 75% lgt. gry. med. xline firm; Chert. 25%± wh. and milky; pyrite, tr. flts. bryozoa, crinoid stems
	1636 1/2	Ls. 80%± bt. and lgt. gry. med. xline, in part granular; Chert 20%± milky and wh.; flts. crinoid stems
AI	40	1640 1/2 Ls. 75%± bt. and lgt. gry. med. xline, finely comminuted by drill; Chert 25%± milky and wh.
	1645 1/2	Ls. 60%± lgt. gry. med. xline, in part granular; Chert 30%± milky and wh.; Quartz 10% in cubedraled xstals and xline masses
AI	50	1650 Ls. Similar to 1645 1/2-1650 1/2
	1655 1/2	Ls. 60%± bt. to lgt. gry. med. xline, in part granular; Chert 30%± milky and wh. and lgt. gry.; Quartz 10% in cubedraled xstals and in xline masses
AI	60	1660 1/2 Ls. 60%± lgt. and medium gry. med. xline, in part granular; Chert 40%± milky, lgt. gry. casing scale abundant
	1664 1/2	Ls. 80%± lgt. and medium gry. med. xline granular, porous; Chert 20%± wh. and milky; pyrite, tr. flts. bryozoa, small ant. gry. sh. cap.
	1665 1/2	
AI	70	1669 1/2 Ls. 80%± lgt. and med. gry., med. xline, granular, porous; Chert 17%± wh. and milky; Quartz 3% in xline masses; Small ant. sh. casing
	1674 1/2	Chert - 65%± wh., lgt. gry. and milky; Ls. 35%± lgt. gry. med. xline granular, porous; flts. bryozoa, crinoid stems
AI	80	1679 1/2 Chert - 60%± wh. lgt. gry. and milky; Ls. 37%± lgt. and med. gry. med. xline, granular, porous; Quartz 3% in cubedraled xstals and xline masses; flts. bryozoa, crinoid stems
	1684 1/2	Chert - 60%± wh. lgt. gry. and milky; Ls. 35%± lgt. and med. gry. med. xline, granular, porous; Quartz 5%± in cubedraled xstals and xline masses; flts. bryozoa, crinoid stems
AI	90	1689 1/2 Ls. 60%± bt. and lgt. gry. med. xline, granular, porous; Chert 35%± wh. milky, and lgt. gry.; Quartz 5%± in cubedraled xstals and xline masses; flts. crinoid stems, bryozoa
	1693 1/2	Ls. 70%± bt. and lgt. gry. med. to fine xline, firm; Chert 30%± wh. milky and lgt. gry.; glauconite, tr.; flts. crinoid stems, bryozoa
	1698 1/2	Ls. 85%± bt. to med. brown, med. xline, firm; Chert 15%± wh. milky, and lgt. gry.; glauconite, tr.; flts. crinoid stems, bryozoa

Location Lenox Tower Date Drilled June 1935 Analyst Talleg

00	1698 1/2	See page 17
AI	1701 1/2	Ls. 85% ± bf to lgt brwn, med to fine xline, firm; Chert, 15% ± wh. bf. to lgt. gry; glauconite tr; flts. - crinoid stems brachi. frags, bryozoa; pyrite tr.
AI	1705	Ls. 95% ± bf to lgt. brwn, med to fine xline, firm; Chert 5% ± wh and lgt gry; pyrite, tr. flts. crinoid stems, bryozoa; staly tr.
10	1707 1/2	Ls. 95% bf, and lgt to dk. brwn, med to fine xline, granular; Chert, 5% wh. and lgt. gry; glauconite, tr; pyrite, tr; flts. - as above
AI	1711 1/2	Ls. 90% bf to lgt brwn; med. xline, granular, porous; Chert, 10% ± wh and lgt gry; pyrite, tr.; flts. - crinoid stems, bryozoa, ostracods (?)
AI	1715 1/2	Ls. 90% med. to dk. brwn, med. xline, granular, porous; Chert 5% ±
AI	1717 1/2	Ls. lgt. gry to dk. brwn. pyrite, tr. flts. crinoid stems, bryozoa, brachi frags abund. (See capsule)
AI	1721 1/2	Ls. 50% ± med to dk. gry. med. xline, very flts. (see capsule - Washed sample) - granular porous, Sh. 50% ± med gry. calc to 15% sol. soft, friable pyrite, tr.
AI	1723 1/2	Ls. 99% lgt to dk. brwn, med. xline granular, porous; flts. crinoid stems, bryozoa, brachi frags. abundant; pyrite 1% ±
AI	1725 1/2	Ls. 95% lgt to dk. brwn, med. xline granular, porous; Chert 5% ± wh and lgt gry; pyrite, tr. few frags. gry silty sh. may be caving; flts. abund.
AI	1726 1/2	Ls. 92% ± lgt. gry and dk. brwn, med. xline granular, friable; Chert 5% ± lgt. gry; Sh. 3% ± lgt to med gry. silty, pyrite, tr. flts. as above
30	1728 1/2	Ls. 94% lgt to dk. brwn med. xline granular porous; flts. crinoid stems, bryozoa, abundant - ostracods, sea capsule; pyrite, 1%
AI	1731	Chert 60% lgt. gry; Ls. 40% ± lgt to dk. brwn med. xline granular, porous; pyrite, tr; flts. crinoid stems bryozoa, brachi frags.
AI	1734 1/2	Chert. 60% wh and lgt gry; Ls. 40% ± lgt to dk. brwn med. xline granular, porous, finely comminuted by drill; pyrite, tr; gypsum, tr; flts. crinoid stems, bryozoa
AI	1737 1/2	Ls. 45% bf. composed of oolites (60%) and elastic fragments (40%); Chert, 5% ± wh. to lgt gry; clear quartz frags, tr; pyrite, tr. flts. - crinoid stems bryozoa, brachi. frags.
AI	1742 1/2	Ls. similar to 1737 1/2 - 1742 1/2, with a few frags of gry sh, probably caved.
AI	1744 1/2	Ls. 95% ± lgt, in part med. xline, granular, porous; in part oolitic; in part elastic; Sh. 3% dk. brwn non-calc; ferruginous; glauconite, tr. flts. 9% Grysh core 3% ±
AI	1750	Ls. 50% bf. similar to 1747 1/2 - 1750%, with hematite 12%; Sh. 50% med gry calc. 10-15% sol. soft. friable, ferruginous; (sample 68.570.501)
AI	1756	Sh. 95% lgt. gry. calc. 30% sol. soft, friable; Ls. frags 4% bf med xline; hematite, 1% ± (sample 30.670.501)
AI	1757 1/2	T.D.
60		
70		
80		
90		
00		

Ss. 1378½-1396½ - A to a. maj. gr. ¼-⅛, prim. sub ½-¼ (1378½-1381½) and ⅛-⅙ (1381½-1396½); secondary enlargement rare (1378-1381½), common (1381½-1386½) and rare (1386½-1396½)

Ss. 1422½-1455½ - Ang to Curvilinear, with predominance of angular grains (1422½-1435½); Curvilinear grains common in larger grades (1435½-1455½);
maj. grade ¼-⅛ (1422½-1451½);
⅛-⅙ (1451½-1455½)
prim. subs. grade ⅛-⅙ (1422½-1427½)
½-¼ (1427½-1447½)
⅛-⅙ (1447½-145½)
¼-⅛ (145½-1455½)

Secondary enlargement present throughout.

Brown fine v. line dol. and lgt. gry. chert noted between.
1443½-1447½.

Lenox - Public Well

Drift	0-275	
Orad	303	
Douglas	400	
Lanning-KC	715	(Base Kertha)
Pleasanton	830	
Henrietta	920	(Base Ft. Scott)
Cherokee	1378	
St. Gene.	1458	
St. Louis	1495	
Warsaw	1590	
Keok.-Burl.	1698	
Glenns City	1745	
Kenderhook sh.	1760	

1597
1389
1378

Correlations by Mo. Geol. Survey. Based on recent work (Fall 1958) with insoluble residues.
Information from Anthony Folger

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl...15...%)

1. Sample weight	31.55 gm.	100.0%	2. Wt. of F. P. <u>2.50</u>
3. Wt. after solution, with filter paper	25.32 gm.		
4. Less wt. F. P. (2)	2.50 gm.		
5. Wt. Insol. Residue (3 minus 4)	22.82 gm.	72.4%	
6. Wt. lost by solution (1 minus 5)	8.73 gm.	27.6%	
7. To balance (5 plus 6)	31.55 gm.	100.0%	

Well No. W- 0117
 Depth 283 to 300
 No. samples used 9
 Analyst Scott
 Date 3/4/35

B. Subsidiation:

1. Original Wt.	22.82 gm.	100.0%
2. Cylinder (+1/32) <u>18.11</u>	15.83 gm.	69.4%
3. Jar (1/32-1/64) <u>2.28</u>	2.53 gm.	11.1%
4. Drain <u>4.71</u>	4.96 gm.	19.5%

C. Screen Analysis 15.1

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	14.97	68.9
1/4-1/8 mm	4.90	31.1
1/8-1/16		
Pan		
Total	15.77	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } 2.93± Sp. gr. Size-Grade(s) 1/4-Pan mm.

Analyst Dean Frasca
 Date 5-7-35

Wt. of sample	3.00 gm.	100.0%
Heavy Minerals	0.03 gm.	1.0%
Light Minerals	2.96 gm.	99.0%

Shape Analysis:

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

Minerals Identified; Heavy Concentrate	No. of Grains	Rel. %
amphibole	4	.2
pyrite	1593	96.5
scale	19	1.1
zircon	1	.1
clay minerals	26	1.5
leucocene	3	.2
Total	1657	100%

Classification Grouping: Primary Minerals:	Absol. %
four mineral green	0
brown	0
blue	0
amphibole	0
feldspar	16.0
scale	0
zircon	0
clay minerals	30.0
quartz	3.0

Light Concentrate		
feldspar	480	16.2
clay minerals	2400	80.8
quartz	88	3.0

Secondary Minerals:	%
leucocene	0
pyrite	1.0
scale	0

Total 3918 100% Total 100%

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

Shale 72% - black to gray - carbonaceous
Some feldspars & quartz lost by solution 27%

W-0117

Log of Samples taken
since 6 AM Dec 22

Till, Light Brown to buff, Pebbles and few angular
pieces of Ls, Distinctly till - - - 263-266

Till, Mostly unoxidized, Light Gray to blue, some
ashen gray. Large pebbles - - - - - 266-269.

Till, Till & silty traces of shaley material
Possibly Near bed-rock, Light Gray - - - 269-272

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl) 15 %

1. Sample weight 30.81 gm. 100.0%: F. P. 2.42
2. Wt. of
3. Wt. after solution, with filter paper 28.37 gm.
4. Less wt. F. P. (2) 1.42 gm.
5. Wt. Insol. Residue (3 minus 4) 25.95 gm. 84.1 %
6. Wt. lost by solution (1 minus 5) 4.89 gm. 15.9 %
7. To balance (5 plus 6) 30.81 gm. %

B. Subsidiation:

1. Original Wt. 25.95 gm. 100.0%
1.453
2. Cylinder (+1/32) 12.37 gm. 47.7 %
2.16
6.90
3. Jar (1/32—1/64) 4.49 gm. 17.3 %
2.31
4. Drain 9.09 gm. 35.0 %

Well No. W— 0117

Depth 274 to 282

No. samples used 3

Analyst Scott

Date 3/4/35

C. Screen Analysis 12.31

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1-1/4 mm	<u>4.11</u>	<u>33.3</u>
1/4-1/8 mm	<u>8.20</u>	<u>66.7</u>
1/8-1/16		
Pan		
Total	<u>12.31</u>	<u>100.0</u>

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. }
Bromoform } 2.934 Sp. gr. Grade(s) 1/4-Pan mm.

Analyst Dean F. Frische

Date 5-7-35

Wt. of sample 2.99 gm. 100.0%

Shape Analysis:

Heavy Minerals 0.2 gm. 7 %

A. %: a %: C %

Light Minerals 2.97 gm. 99.7 %

r %: R %

Minerals Identified;
Heavy Concentrate

No. of Grains Rel. %

Classification Grouping:

Absol. %

pyrite	241	49.7
zircon	21	4.3
tourmaline-green	5	1.6
amphibole	5	1.0
leucosene	28	5.6
limonite	124	24.8
magnetite or ilmenite	5	1.0
garnet	4	.8
epidote	3	.6
carbonate	17	3.4
muscovite	2	.4
barite	2	.4
anhydrite	2	.4

Primary Minerals:	<u>99.4</u> %	
zircon		0
tourmaline-green		0
amphibole		0
magnetite or ilmenite		0
garnet		0
epidote		0
anhydrite		0
barite		0
quartz		5.4
Clay minerals		94.0

Total 486 100%

Secondary Minerals: 0.6 %

quartz	117	5.4
Clay minerals	300	94.6

pyrite		4
leucosene		0.2
limonite		0
carbonate		0

Total 2117 100%

Total 100%

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

Shale 89% - black - gray to brown carbonaceous - fossiliferous
massive - fusolinas - conoid (?) - calcareous - some quartz
lost by solution 15%

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

- | | | | | |
|--|------------------|----------------|-------------------------|--|
| 1. Sample weight | <u>31.82</u> gm. | 100.0% | 2. Wt. of F. P. | |
| 3. Wt. after solution, with filter paper | <u>13.51</u> gm. | | | |
| 4. Less wt. F. P. (2) | <u>2.16</u> gm. | | | |
| 5. Wt. Insol. Residue (3 minus 4) | <u>11.35</u> gm. | <u>35.7</u> % | | |
| 6. Wt. lost by solution (1 minus 5) | <u>20.47</u> gm. | <u>64.3</u> % | | |
| 7. To balance (5 plus 6) | <u>31.82</u> gm. | <u>100.0</u> % | | |

Well No. W— 0.117
 Depth 303 to 307
 No. samples used 2
 Analyst Scott
 Date 3/4/35

B. Subsidiation:

- | | | | | |
|-------------------------------|------------------|---------------|-----------------|---------------|
| 1. Original Wt. | <u>11.35</u> gm. | 100.0% | | |
| 2. Cylinder (+1/32) | <u>9.78</u> | | | |
| | <u>2.17</u> | | <u>7.61</u> gm. | <u>67.1</u> % |
| 3. Jar (1/32—1/64) | <u>3.27</u> | | <u>9.6</u> gm. | <u>8.4</u> % |
| | <u>2.31</u> | | | |
| 4. Drain | <u>2.78</u> gm. | <u>24.5</u> % | | |

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1-1/4 mm		
3/4-1/2 mm	<u>4.40</u>	<u>5.9</u>
1/4-1/8 mm	<u>3.06</u>	<u>41.1</u>
1/8-1/16		
Pan		
Total	<u>7.46</u>	<u>100.0</u>

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform { 2.93± Sp. gr. Size-Grade(s) 1/4 - Pan mm.

Analyst Dean Frascchi
 Date 5-10-35

Wt. of sample 2.98 gm. 100.0%
 Heavy Minerals 0.01 gm. 0.3 %
 Light Minerals 2.97 gm. 99.7 %

Shape Analysis:

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

Minerals Identified:
 Heavy Concentrate

No. of Grains Rel. %

Classification Grouping:

Absol. %

<u>Zircon</u>	<u>3</u>	<u>0.9</u>
<u>pyrite</u>	<u>654</u>	<u>85.1</u>
<u>barite</u>	<u>2</u>	<u>.2</u>
<u>amphibole</u>	<u>31</u>	<u>3.1</u>
<u>ferromagnesian green</u>	<u>1</u>	<u>.1</u>
<u>garnet</u>	<u>1</u>	<u>.1</u>
<u>leucosene</u>	<u>4</u>	<u>.4</u>
<u>epidote</u>	<u>3</u>	<u>.3</u>
<u>Clay minerals</u>	<u>303</u>	<u>30.2</u>

Primary Minerals: 99.7 %

<u>Zircon</u>		<u>0</u>
<u>barite</u>		<u>0</u>
<u>amphibole</u>		<u>0</u>
<u>ferromagnesian</u>		<u>0</u>
<u>garnet</u>		<u>0</u>
<u>epidote</u>		<u>0</u>
<u>Clay minerals</u>		<u>99.1</u>
<u>quartz</u>		<u>2.7</u>

Total 1004 100%

Light Concentrate

Secondary Minerals: %

<u>quartz</u>		<u>2.7</u>
<u>Clay minerals</u>		<u>17.8</u>

<u>pyrite</u>		<u>0.2</u>
<u>leucosene</u>		<u>0</u>

Total 1748 100% Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).
limestone 64% - light gray fine crystalline dense -
shale - 35% light gray calcareous - some quartz

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl 1.5 %)

1. Sample weight	<u>32.41</u> gm.	100.0%	2. Wt. of F. P.	<u>2.37</u>
3. Wt. after solution, with filter paper	<u>9.83</u> gm.			
4. Less wt. F. P. (2)	<u>2.37</u> gm.			
5. Wt. Insol. Residue (3 minus 4)	<u>7.46</u> gm.	<u>23</u> %		
6. Wt. lost by solution (1 minus 5)	<u>24.95</u> gm.	<u>77</u> %		
7. To balance (5 plus 6)	<u>32.41</u> gm.	<u>100</u> %		

Well No. W- 0.417
 Depth 300 to 303
 No. samples used 1
 Analyst Scott
 Date 3/4/35

B. Subsidiary:

1. Original Wt.	<u>7.46</u> gm.	100.0%
2. Cylinder (+1/32)	<u>6.91</u> gm.	<u>95.9</u> %
3. Jar (1/32-1/64)	<u>0.37</u> gm.	<u>5</u> %
4. Drain	<u>0.68</u> gm.	<u>9.1</u> %

C. Screen Analysis 27

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	<u>3.88</u>	<u>51.6</u>
1/4-1/8 mm	<u>2.48</u>	<u>39.4</u>
1/8-1/16		
Pan		
Total	<u>6.30</u>	<u>100.0</u>

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } 2.935 Sp. gr. Size-Grade(s) Pan mm.

Analyst Dean Fraschi
 Date 5-10-35

Wt. of sample	<u>2.42</u> gm.	100.0%
Heavy Minerals	<u>0.02</u> gm.	<u>0.8</u> %
Light Minerals	<u>2.40</u> gm.	<u>99.2</u> %

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

Minerals Identified:	No. of Grains	Rel. %
Heavy Concentrate		
tourmaline-green	3	.8
amphibole	35	8.8
garnet	10	2.5
zircon	1	.2
chlorite	1	.3
barite	3	.8
scale	102	25.2
leucosene	5	1.2
pyrite	226	56.0
magnetic (?)	5	1.2
epidote	5	1.2
kaolite	1	.2
Total	<u>410</u>	<u>100%</u>

Classification Grouping:	Absol. %
Primary Minerals:	<u>99</u> %
tourmaline	0
amphibole	0.1
garnet	0
zircon	0
chlorite	0
barite	0
magnet.	0
epidote	0
kaolite	0
feldspar	4.6
clay minerals	91.4
quartz	3.6

Light Concentrate	No. of Grains	Rel. %
feldspar	80	4.6
clay	1600	91.8
quartz	64	3.6

Secondary Minerals:	Absol. %
scale	0.2
leucosene	0
pyrite	0.2

Total 1744 100% Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).
limestone 77% - hard gray - crystalline dense - shale 23%
hard - gray - calcareous

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15%)

- | | | | |
|--|------------------|---------------|-----------------------------|
| 1. Sample weight | <u>30.42</u> gm. | 100.0% | 2. Wt. of F. P. <u>2.39</u> |
| 3. Wt. after solution, with filter paper | <u>28.11</u> gm. | | |
| 4. Less wt. F. P. (2) | <u>2.39</u> gm. | | |
| 5. Wt. Insol. Residue (3 minus 4) | <u>5.72</u> gm. | <u>84.5</u> % | |
| 6. Wt. lost by solution (1 minus 5) | <u>4.70</u> gm. | <u>15.5</u> % | |
| 7. To balance (5 plus 6) | <u>30.42</u> gm. | | |

B. Subsidiation:

- | | | | |
|----------------------------------|------------------|---------------|--|
| 1. Original Wt. | <u>25.72</u> gm. | 100.0% | |
| 2. Cylinder (+1/32) <u>16.27</u> | <u>13.76</u> gm. | <u>53.5</u> % | |
| 3. Jar (1/32—1/64) <u>5.62</u> | <u>3.17</u> gm. | <u>12.3</u> % | |
| 4. Drain <u>2.45</u> | <u>8.79</u> gm. | <u>34.2</u> % | |

Well No. W— 0117

Depth 307 to 312

No. samples used 3

Analyst Scott

Date 3/4/35

C. Screen Analysis 13.11

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	<u>7.90</u>	<u>58.0</u>
1/4-1/8 mm	<u>5.73</u>	<u>42.0</u>
1/8-1/16		
Pan	<u>1363</u>	
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } 2.934 Sp. gr. Size-Grade(s) Pan mm.

Wt. of sample 3.15 gm. 100.0% Shape Analysis:

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

Light Minerals gm. 99.7 % r %: R %

Minerals Identified; Heavy Concentrate No. of Grains Rel. % Classification Grouping: Primary Minerals: 99.7 % Absol. %

<u>pyrite</u>	<u>187</u>	<u>23.3</u>	<u>epidote</u>		<u>0</u>
<u>epidote</u>	<u>2</u>	<u>.2</u>	<u>tourmaline</u>		<u>0</u>
<u>tourmaline-green</u>	<u>1</u>	<u>.1</u>	<u>amphibole</u>		<u>0</u>
<u>amphibole-green</u>	<u>7</u>	<u>.9</u>	<u>garnet</u>		<u>0</u>
<u>garnet</u>	<u>2</u>	<u>.2</u>	<u>zircon</u>		<u>1.4</u>
<u>zircon</u>	<u>1</u>	<u>.1</u>	<u>clay-minerals</u>		<u>98.3</u>
<u>leucosene</u>	<u>3</u>	<u>.4</u>			
<u>Clay</u>	<u>602</u>	<u>74.8</u>			

Total 805 100%

Light Concentrate
quartz 1.4
Clay-minerals 98.6
 Secondary Minerals: 3 %
pyrite1
leucosene20
Clay20

Total 2232 100% Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).
Shale - 84% greenish gray - calcareous thin laminated
limestone 15% -

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15.2%)

- | | | | | |
|--|-----------|--------|-----------------|------|
| 1. Sample weight | 30.97 gm. | 100.0% | 2. Wt. of F. P. | 2.29 |
| 3. Wt. after solution, with filter paper | 27.42 gm. | | | |
| 4. Less wt. F. P. (2) | 2.29 gm. | | | |
| 5. Wt. Insol. Residue (3 minus 4) | 25.14 gm. | 81.9% | | |
| 6. Wt. lost by solution (1 minus 5) | 5.83 gm. | 19.1% | | |
| 7. To balance (5 plus 6) | 30.97 gm. | 100% | | |

B. Subsidiary:

- | | | |
|---------------------|-----------|--------|
| 1. Original Wt. | 25.14 gm. | 100.0% |
| 2. Cylinder (+1/32) | 12.84 gm. | 51.1% |
| 3. Jar (1/32-1/64) | 1.86 gm. | 7.4% |
| 4. Drain | 10.44 gm. | 41.5% |

Well No. W— 0117

Depth 312 to 324

No. samples used 6

Analyst SCOTT

Date 3/4/35

C. Screen Analysis 12.60

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	8.82	70.3
1/4-1/8 mm	3.72	29.7
1/8-1/16		
Pan		
Total	12.60	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } 8.93+ Sp. gr. Size-Grade(s) 1/4-Pan mm.

Analyst KUNDERT

Date MAY 13, 1935

Wt. of sample 3.01 gm. 100.0%

Shape Analysis:

Heavy Minerals .01 gm. 0.3 %

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

Light Minerals 3.00 gm. 99.7 %

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

Minerals Identified: Heavy Concentrate

No. of Grains

Rel. %

Classification Grouping:

Absol. %

Purite
Sphalerite
Zircon-Unzoned
Tourmaline-Brown
Garnet
Leucosene
Homblende
Scale
Clay Aggregates

28	6.1
1	.2
2	.4
1	.2
2	.4
7	1.5
8	1.7
1	1.5
405	98.0
461	100%

Primary Minerals: 98.7 %

Homblende
Tourmaline-Brown
Zircon-Unzoned
Garnet
Clay Minerals
Quartz
Clay Aggregates

.0
.0
.0
.0
89.5
8.9
.3

Total

Light Concentrate

Chert
Quartz
Clay Minerals

15	1.3
100	8.9
1015	89.8

Secondary Minerals: 1.3 %

Sphalerite
Purite
Chert
Leucosene
Scale

.3
1.3
.0
.0

Total

1130 100%

Total

100%

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

Shale, 95-100% red and light grey, calcareous 20%+ soluble, ferruginous; limestone 1-5%+;

DEEP WELL STUDY

MECHANICAL ANALYSIS

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

1. Sample weight	30.83 gm.	100.0%	2. Wt. of F. P.	2.17
3. Wt. after solution, with filter paper	25.36 gm.			
4. Less wt. F. P. (2)	2.17 gm.			
5. Wt. Insol. Residue (3 minus 4)	23.19 gm.	75.2%		
6. Wt. lost by solution (1 minus 5)	7.64 gm.	24.9%		
7. To balance (5 plus 6)	30.83 gm.	100.0%		

Well No. W- 0.17
 Depth 326 to 336
 No. samples used 5
 Analyst Scott
 Date 3/1/35

B. Subsidiation:

1. Original Wt.	23.19 gm.	100.0%
2. Cylinder (+1/32)	9.97 gm.	43.1%
3. Jar (1/32-1/64)	4.44 gm.	19.1%
4. Drain	8.78 gm.	37.8%

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	9.60	42.1
1/4-1/8 mm	15.79	57.9
1/8-1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform { 2.937 Sp. gr. Size-Grade(s) 1/4-Pan mm.

Analyst KUNDERT
 Date MAY 14, 1935

Wt. of sample 3.19 gm. 100.0% Shape Analysis:

Heavy Minerals .01 gm. 0.3% A.....%: a.....%: C.....%

Light Minerals 3.18 gm. 99.7% r.....%: R.....%

Minerals Identified: Heavy Concentrate

No. of Grains Rel. %

Classification Grouping:

Absol. %

Pyrrite
 Zircon-Unzoned
 Tourmaline-Brown
 Leucoxene
 Hornblende
 Clay Aggregates

45	8.9
1	.2
1	.2
4	.8
5	1.0
450	88.9

Primary Minerals: 98.2%

Hornblende .0
 Zircon-Unzoned .0
 Tourmaline-Brown .0
 Clay Aggregates .3
 Quartz 10.3
 Clay Minerals 87.6

Total 506 100%

Light Concentrate

Chert
 Clay Minerals
 Quartz

20	1.8
984	87.9
115	10.3

Secondary Minerals: 1.8%

Chert 1.8
 Leucoxene .0
 Pyrite .0

Total 1119 100%

Total 100%

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

shale 95-1000 lb, light gray, greenish-red, 2 solat soluble
 ferruginous; limestone 1-solat buff, fine, dense,
 pyrite trace;

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl...15...%)

- | | | | | |
|--|-----------|--------|-----------------|------|
| 1. Sample weight | 30.93 gm. | 100.0% | 2. Wt. of F. P. | 2.41 |
| 3. Wt. after solution, with filter paper | 30.60 gm. | | | |
| 4. Less wt. F. P. (2) | 2.41 gm. | | | |
| 5. Wt. Insol. Residue (3 minus 4) | 28.19 gm. | 91.1% | | |
| 6. Wt. lost by solution (1 minus 5) | 2.74 gm. | 8.9% | | |
| 7. To balance (5 plus 6) | 30.93 gm. | 100.0% | | |

Well No. W- 0117
 Depth 336 to 347
 No. samples used 5
 Analyst Scott
 Date 3/4/35

B. Subsidiation:

- | | | |
|---------------------|-----------|--------|
| 1. Original Wt. | 28.19 gm. | 100.0% |
| 2. Cylinder (+1/32) | 18.87 gm. | 58.5% |
| | 2.41 gm. | |
| | 5.29 gm. | |
| 3. Jar (1/32-1/64) | 3.00 gm. | 10.6% |
| | 2.29 gm. | |
| 4. Drain | 8.73 gm. | 30.7% |

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	8.16	49.9
1/4-1/8 mm	8.21	58.1
1/8-1/16		
Pan		
Total	16.37	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } 2.92+ Sp. gr. Size-Grade(s) 1/4-Pan mm.

Analyst KUNDERT
 Date MAY 14, 1935

Wt. of sample 3.42 gm. 100.0%

Shape Analysis:

Heavy Minerals 0.1 gm. 3%

A. %: a. %: C. %

Light Minerals 3.41 gm. 99.7%

r %: R %

Minerals Identified:
 Heavy Concentrate

No. of Grains Rel. %

Classification Grouping:

Absol. %

- Pyrite
- Zircon-Unzoned
- Tourmaline-Brown
- Leucosene
- Chlorite
- Scale
- Pyritic Clays

580	68.6
4	.5
2	.2
7	.8
1	.1
2	.2
250	29.6

Primary Minerals: 99.7%

- Zircon-Unzoned 0
- Tourmaline-Brown 0
- Clays 91.3
- Quartz 84

Total 846 100%

Light Concentrate

820	91.6
75	8.4

Secondary Minerals: 3%

- Chlorite 0
- Pyrite 3
- Leucosene 0
- Scale 0

Total 895 100%

Total 100%

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

shale 97-100 dot gray calcareous, 100% soluble, micaceous
 scapy

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl...15.....%)

1. Sample weight	30.71 gm.	100.0%	2. Wt. of F. P. <u>2.17</u>
3. Wt. after solution, with filter paper	30.75 gm.		
4. Less wt. F. P. (2)	2.17 gm.		
5. Wt. Insol. Residue (3 minus 4)	28.58 gm.	93.0%	
6. Wt. lost by solution (1 minus 5)	2.13 gm.	7.0%	
7. To balance (5 plus 6)	30.71 gm.	100.0%	

Well No. W- 0117
 Depth 347 to 350
 No. samples used 1
 Analyst Scott
 Date 3/4/35

B. Subsidiary:

1. Original Wt.	28.58 gm.	100.0%
2. Cylinder (+1/32) <u>19.38</u>	17.00 gm.	59.5%
3. Jar (1/32-1/64) <u>2.38</u>	3.58 gm.	12.5%
4. Drain <u>5.74</u>	8.00 gm.	28.0%

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1 -1/4 mm	6.14	36.2
1/4-1/8 mm	10.80	63.8
1/8-1/16		
Pan		
Total	16.94	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } 2.933 Sp. gr. Size-Grade(s) 1/4-Pan mm.

Analyst KUNDERT
 Date MAY 14, 1935

Wt. of sample 3.17 gm. 100.0% Shape Analysis:

Heavy Minerals 1.01 gm. 3 % A.....%: a.....%: C.....%

Light Minerals 3.16 gm. 99.7 % r.....%: R.....%

Minerals Identified: Heavy Concentrate No. of Grains Rel. % Classification Grouping: Primary Minerals: 97.2 % Absol. %

Pyrrite	400	53.6	Jourmaline-Brown	.0
Sphalerite	5	.7	Zircous-Unzoned	.0
Zircon-Unzoned	2	.3	Clay Minerals	84.0
Jourmaline-Brown	1	.1	Quartz	13.2
Leucosene	10	1.3		
Carbonates	1	.1		
Chlorite	3	.4		
Clays	325	43.5		

Total 7.47 100%

Light Concentrate			Secondary Minerals: <u>2.7</u> %	
Chert	25	2.6	Carbonates	.0
Quartz	127	13.3	Sphalerite	.0
Clays	800	84.1	Chlorite	.2
			Pyrrite	2.6
			Chert	.0
			Leucosene	.0

Total 9.52 100% Total 100%

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

Shale - 97-100%, gray + red, 7% soluble, micaceous

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15%)

- | | | | |
|--|------------------|----------------|-----------------------------|
| 1. Sample weight | <u>30.42</u> gm. | 100.0% | 2. Wt. of F. P. <u>2.18</u> |
| 3. Wt. after solution, with filter paper | <u>27.22</u> gm. | | |
| 4. Less wt. F. P. (2) | <u>2.18</u> gm. | | |
| 5. Wt. Insol. Residue (3 minus 4) | <u>27.02</u> gm. | <u>88.8</u> % | |
| 6. Wt. lost by solution (1 minus 5) | <u>3.40</u> gm. | <u>11.2</u> % | |
| 7. To balance (5 plus 6) | <u>30.42</u> gm. | <u>100.0</u> % | |

Well No. W- 0117
 Depth 350 to 359
 No. samples used 4
 Analyst Scott
 Date 3/4/35

B. Subsidiary:

- | | | |
|---------------------|------------------|---------------|
| 1. Original Wt. | <u>27.02</u> gm. | 100.0% |
| 2. Cylinder (+1/32) | <u>15.89</u> gm. | <u>58.8</u> % |
| 3. Jar (1/32-1/64) | <u>2.89</u> gm. | <u>10.7</u> % |
| 4. Drain | <u>8.24</u> gm. | <u>30.5</u> % |

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1-1/4 mm	<u>6.89</u>	<u>43.55</u>
1/4-1/8 mm	<u>8.92</u>	<u>56.45</u>
1/8-1/16		
Pan		
Total	<u>15.81</u>	<u>100.0</u>

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } 2.937 Sp. gr. Size-Grade(s) 4-Pan mm.

Analyst KUNDERT
 Date MAY 15, 1935

Wt. of sample 3.15 gm. 100.0% Shape Analysis:

Heavy Minerals .01 gm. 3 % A. %: a. %: C. %

Light Minerals 3.14 gm. 99.7 % r. %: R. %

Minerals Identified: Heavy Concentrate No. of Grains Rel. % Classification Grouping: Primary Minerals: 92.6 % Absol. %

Pyrite
Leucopene
Clays

<u>55</u>	<u>59.8</u>
<u>5</u>	<u>5.4</u>
<u>32</u>	<u>34.8</u>

Clay Minerals 92.5
Quartz 6.1

Total 9.7 100%

Light Concentrate

Chert
Clay Minerals
Quartz

<u>17</u>	<u>1.2</u>
<u>1300</u>	<u>92.7</u>
<u>85</u>	<u>6.1</u>

Secondary Minerals: 1.4 %
Pyrite 2
Leucopene 0
Chert 1.2

Total 1402 100% Total 100%

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

shale - 95-100% gray calcareous, 12% soluble
Limestone 1-5% buff, finely crystalline, dense

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl...15.....%)

1. Sample weight	31.53 gm.	100.0%	2. Wt. of F. P.	2.28
3. Wt. after solution, with filter paper	29.20 gm.			
4. Less wt. F. P. (2)	2.28 gm.			
5. Wt. Insol. Residue (3 minus 4)	26.92 gm.	85.4%		
6. Wt. lost by solution (1 minus 5)	4.61 gm.	14.6%		
7. To balance (5 plus 6)	31.53 gm.	100.0%		

Well No. W- 0117
 Depth 359 to 364
 No. samples used 2
 Analyst Scott
 Date 3/4/35

B. Subsidiation:

1. Original Wt.	26.92 gm.	100.0%
2. Cylinder (+1/32)	17.95 gm.	64.7%
3. Jar (1/32-1/64)	2.39 gm.	8.6%
4. Drain	7.15 gm.	26.6%

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
3/4-1/4 mm	10.25	59.
1/4-1/8 mm	7.10	41.
1/8-1/16		
Pan		
Total	17.35	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } 2.93 ± Sp. gr. Size-Grade(s) Pan mm.

Analyst Dean Frasché
 Date 5-13-35

Wt. of sample	3.25 gm.	100.0%
Heavy Minerals	.02 gm.	0.6%
Light Minerals	3.23 gm.	99.4%

Shape Analysis:

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

Minerals Identified:	No. of Grains	Rel. %
Heavy Concentrate		
barite	17	1.0
pyrite	1264	71.7
zircon	25	1.4
tourmaline green	51	2.9
brown	21	1.2
blue	3	.2
garnet	3	.2
leucosene	125	7.1
amphibole	33	1.9
chlorite	18	1.0
staurolite	1	.1
kaolinitic clay	260	11.3
Total	176	100%

Classification Grouping:	Absol. %
Primary Minerals:	99.6%
zircon	0
tourmaline-green	0
brown	0
blue	0
garnet	0
amphibole	0
chlorite	0
staurolite	0
kaolinitic clay	.1
chert	12.2
clay minerals	36.5
quartz	50.8

Light Concentrate	No. of Grains	Rel. %
chert	156	12.3
clay minerals	460	36.7
quartz	40	51.0

Secondary Minerals:%
 barite%
 pyrite%
 leucosene%

Total 36 100% Total 100%

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

Shale 85% - gray-red calcareous - micaceous
 limestone gray medium - 14% - some quartz
 feldspar - present

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15%)

- | | | | | |
|--|-----------|--------|-----------------|------|
| 1. Sample weight | 30.99 gm. | 100.0% | 2. Wt. of F. P. | 2.50 |
| 3. Wt. after solution, with filter paper | 30.50 gm. | | | |
| 4. Less wt. F. P. (2) | 2.50 gm. | | | |
| 5. Wt. Insol. Residue (3 minus 4) | 28.00 gm. | 90.4% | | |
| 6. Wt. lost by solution (1 minus 5) | 2.99 gm. | 9.6% | | |
| 7. To balance (5 plus 6) | 30.99 gm. | 100.0% | | |

Well No. W- 0117
 Depth 3.64 to 3.77
 No. samples used 4
 Analyst Scott
 Date 3/4/35

B. Subsidiation:

- | | | |
|---------------------|-----------|--------|
| 1. Original Wt. | 2800 gm. | 100.0% |
| 2. Cylinder (+1/32) | 14.69 gm. | 52.5% |
| 3. Jar (1/32-1/64) | 3.92 gm. | 14.0% |
| 4. Drain | 9.39 gm. | 33.5% |

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	5.40	37.0
1/4-1/8 mm	9	63.0
1/8-1/16		
Pan		
Total	14.60	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } 2.92 Sp. gr. Size-Grade(s) Pan mm.

Analyst Dean Frische
 Date 3-13-35

Wt. of sample 3.43 gm. 100.0%

Shape Analysis:

Heavy Minerals 0.0 gm. 0 %

A. 0 %: a. 0 %: C. 0 %

Light Minerals 3.43 gm. 100 %

r 0 %: R 0 %

Minerals Identified:
 Heavy Concentrate

No. of Grains Rel. %

Classification Grouping:
 Primary Minerals: 0 %

Absol. %

<u>barite</u>	<u>1</u>	<u>0</u>
<u>pyrite</u>	<u>225</u>	<u>91.2</u>
<u>garnet</u>	<u>1</u>	<u>.4</u>
<u>leucosene</u>	<u>8</u>	<u>3.2</u>
<u>amphibole</u>	<u>1</u>	<u>.4</u>
<u>limonitic clay</u>	<u>11</u>	<u>4.4</u>

<u>garnet</u>	<u>0</u>
<u>amphibole</u>	<u>0</u>
<u>limonitic clay</u>	<u>0</u>
<u>feldspar</u>	<u>1.9</u>
<u>clay-minerals</u>	<u>32.6</u>
<u>quartz</u>	<u>65.2</u>

Total 347 100%

Light Concentrate

Secondary Minerals: 0 %

<u>feldspar</u>	<u>19</u>	<u>5.4</u>
<u>clay-minerals</u>	<u>960</u>	<u>32.7</u>
<u>quartz</u>	<u>1920</u>	<u>65.4</u>

<u>barite</u>	<u>0</u>
<u>pyrite</u>	<u>0</u>
<u>leucosene</u>	<u>0</u>

Total 293 100%

Total 100%

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

Sandstone - 90% - (felspathic) - below 1/2-1/4 in. in
lost by solution gray medium firm.

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl 2.5%)

- | | | | | |
|--|-----------|--------|-----------------|------|
| 1. Sample weight | 30.52 gm. | 100.0% | 2. Wt. of F. P. | 2.27 |
| 3. Wt. after solution, with filter paper | 30.17 gm. | | | |
| 4. Less wt. F. P. (2) | 2.2 gm. | | | |
| 5. Wt. Insol. Residue (3 minus 4) | 27.90 gm. | 91.4% | | |
| 6. Wt. lost by solution (1 minus 5) | 2.62 gm. | 8.6% | | |
| 7. To balance (5 plus 6) | 30.52 gm. | 100.0% | | |

Well No. W— 0117
 Depth 3.77 to 3.82
 No. samples used 1
 Analyst Scott
 Date 3/14/35

B. Subsidiary:

- | | | |
|---------------------|-----------|--------|
| 1. Original Wt. | 27.90 gm. | 100.0% |
| 2. Cylinder (+1/32) | 17.76 gm. | 63.6% |
| 3. Jar (1/32—1/64) | 3.18 gm. | 11.2% |
| 4. Drain | 7.02 gm. | 25.2% |

C. Screen Analysis 17.68

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1-1/4 mm		42.9
1/4-1/8 mm	11.0	57.1
1/8-1/16		
Pan		
Total	7.63	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } Sp. gr. Size-Grade(s) 1/4 - Pan mm.

Analyst Dawn Frische
 Date 5-16-35

Wt. of sample 3.31 gm. 100.0%

Shape Analysis:

Heavy Minerals 0.015 gm. %

A. %: a. %: C. %

Light Minerals 3.295 gm. 99.5 %

r. %: R. %

Minerals Identified; Heavy Concentrate

No. of Grains

Rel. %

Classification Grouping:

Absol. %

pyrite
leucocene
amphibole
limonitic-clay

73
1.2
.6
8.7

ferrispar
clay minerals
quartz
limonitic-clay
amphibole

2.2
87.2
10.2
0
0

Total 73 100%

Light Concentrate

Secondary Minerals: %

feldspar 24 0.2
clay minerals 960 87.6
quartz 112 0.2

pyrite 0.2
leucocene 0

Total 1096 100%

Total 100%

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

Shale 9/10th gray to red - 100% - some feldspar and quartz - lost by solution 8% - gray - firm

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl 1.5%)

- | | | | |
|--|------------------|---------------|-----------------------------|
| 1. Sample weight | <u>30.49</u> gm. | 100.0% | 2. Wt. of F. P. <u>2.34</u> |
| 3. Wt. after solution, with filter paper | <u>29.80</u> gm. | | |
| 4. Less wt. F. P. (2) | <u>2.34</u> gm. | | |
| 5. Wt. Insol. Residue (3 minus 4) | <u>27.46</u> gm. | <u>90.1%</u> | |
| 6. Wt. lost by solution (1 minus 5) | <u>3.03</u> gm. | <u>9.9%</u> | |
| 7. To balance (5 plus 6) | <u>30.49</u> gm. | <u>100.0%</u> | |

Well No. W— 0117
 Depth 382 to 385
 No. samples used 1
 Analyst Scott
 Date 3/9/35

B. Subsidiation:

- | | | |
|---------------------|------------------|--------------|
| 1. Original Wt. | <u>27.46</u> gm. | 100.0% |
| 2. Cylinder (+1/32) | <u>15.95</u> gm. | <u>58.1%</u> |
| 3. Jar (1/32—1/64) | <u>3.43</u> gm. | <u>12.5%</u> |
| 4. Drain | <u>8.08</u> gm. | <u>29.4%</u> |

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1-1/4 mm	<u>6.77</u>	<u>43.2</u>
1/4-1/8 mm	<u>8.90</u>	<u>56.8</u>
1/8-1/16		
Pan		
Total	<u>15.67</u>	<u>100.0</u>

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } 2.934 Sp. gr. Size-Grade(s) Pan mm.

Analyst Dean Fraschie
 Date 3-16-35

Wt. of sample 3.40 gm. 100.0%

Shape Analysis:

Heavy Minerals 0 gm. 0%

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

Light Minerals 3.39 gm. 99.7%

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

Minerals Identified; Heavy Concentrate

No. of Grains	Rel. %
<u>54</u>	<u>27.9</u>
<u>4</u>	<u>2.1</u>
<u>2</u>	<u>1.0</u>

Classification Grouping:

Primary Minerals: <u>97.1</u> %	Absol. %
<u>zircon</u>	<u>0</u>
<u>tourmaline</u>	<u>0</u>
<u>garnet</u>	<u>0</u>
<u>amphibole</u>	<u>0</u>
<u>chlorite</u>	<u>0</u>
<u>clay minerals</u>	<u>97.1</u>
<u>quartz</u>	<u>2.6</u>

Total 3.40 gm. 100%

Light Concentrate

<u>clay minerals</u>	<u>2.00</u>	<u>97.4</u>
<u>quartz</u>	<u>.50</u>	<u>2.6</u>

Secondary Minerals: 0.2%

<u>pyrite</u>	<u>0.2</u>
<u>leucocene</u>	<u>0.1</u>

Total 2056 100%

Total 100%

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

Shale 90% - gray calcareous - micaceous
lost by solution 9% - gray - medium crystalline
firm.

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl...15...%)

1. Sample weight	29.51 gm.	100.0%	2. Wt. of F. P.	2.20
3. Wt. after solution, with filter paper	27.79 gm.			
4. Less wt. F. P. (2)	2.20 gm.			
5. Wt. Insol. Residue (3 minus 4)	25.59 gm.	76.7%		
6. Wt. lost by solution (1 minus 5)	3.92 gm.	13.3%		
7. To balance (5 plus 6)	29.51 gm.	100.0%		

B. Subsidiation:

1. Original Wt.	25.59 gm.	100.0%
2. Cylinder (+1/32)	1.81	7.1%
3. Jar (1/32-1/64)	2.53 gm.	9.9%
4. Drain	7.23 gm.	28.2%

Well No. W- 0117
 Depth 390 to 394
 No. samples used 2
 Analyst Scott
 Date 3/4/35

C. Screen Analysis 15.66

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1-1/4 mm	6.43	41.3
1/4-1/8 mm	9.12	58.7
1/8-1/16		
Pan		
Total	15.55	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } 2.93± Sp. gr. Size-Grade(s) Pan mm.

Analyst Dean Frasché
 Date 5-16-35

Wt. of sample	3.96 gm.	100.0%
Heavy Minerals	.005 gm.	.1%
Light Minerals	3.915 gm.	99.9%

Shape Analysis:

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

Minerals Identified:

No. of Grains

Rel. %

Classification Grouping:

Absol. %

pyrite
 limonitic clay

104	46.6
117	53.4

Primary Minerals: 99.9%

Clay minerals 99.9

Total 223 100%

Light Concentrate

Clay minerals 1000 100

Secondary Minerals: %

pyrite
 limonitic clay

Total 100% Total 100%

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

Sp. 86% - gray to buff-calcareous
 lost by solution 13% gray fine clay
 dens a

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl...%)

1. Sample weight	30.40 gm.	100.0%	2. Wt. of F. P.	2.14
3. Wt. after solution, with filter paper	22.35 gm.			
4. Less wt. F. P. (2)	2.14 gm.			
5. Wt. Insol. Residue (3 minus 4)	20.21 gm.	66.5%		
6. Wt. lost by solution (1 minus 5)	10.19 gm.	33.5%		
7. To balance (5 plus 6)	30.40 gm.	100.0%		

Well No. W- 0117
 Depth 394 to 398
 No. samples used 1
 Analyst Scott
 Date 3/4/35

B. Subsidiation:

1. Original Wt.	20.21 gm.	100.0%
2. Cylinder (+1/32)	11.68 gm.	57.8%
3. Jar (1/32-1/64)	2.16 gm.	10.7%
4. Drain	6.37 gm.	31.5%

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	4.33	37.4
1/4-1/8 mm	7.26	62.6
1/8-1/16		
Pan		
Total	11.59	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } 2.935 Sp. gr. Size-Grade(s) 1/4-Pan mm.

Analyst Dean Frasché
 Date 5-17-34

Wt. of sample	3.80 gm.	100.0%
Heavy Minerals	2.015 gm.	0.5%
Light Minerals	1.785 gm.	99.5%

Shape Analysis:

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

Minerals Identified; Heavy Concentrate

No. of Grains	Rel. %
32	9.1
98	85.2
15	4.3
5	1.4

Classification Grouping:

Primary Minerals:%
 Clay minerals 91.0
 quartz 2.6

Total 35 100%

Light Concentrate

Clay (Fe) minerals	2100	97.4
	51	2.2

Secondary Minerals:%

barite 0.4
 pyrite 0
 hematite 0
 limonitic clay 0

Total 2156 100%

Total 100%

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

Shale - 66% gray - calcareous - carbonaceous - blocky
 lost by solution 33% - gray - fine - crystalline

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl.....15.....%)

- | | | | |
|--|-----------|--------|----------------------------|
| 1. Sample weight | 30.78 gm. | 100.0% | 2. Wt. of F. P. <u>251</u> |
| 3. Wt. after solution, with filter paper | 21.98 gm. | | |
| 4. Less wt. F. P. (2) | 251 gm. | | |
| 5. Wt. Insol. Residue (3 minus 4) | 19.47 gm. | 63.2% | |
| 6. Wt. lost by solution (1 minus 5) | 1.31 gm. | 36.8% | |
| 7. To balance (5 plus 6) | 20.78 gm. | 100.0% | |

Well No. W- 0117
 Depth 398 to 401
 No. samples used 1
 Analyst Scott
 Date 3/1/35

B. Subsidiation:

- | | | |
|----------------------------------|-----------|--------|
| 1. Original Wt. | 19.47 gm. | 100.0% |
| 2. Cylinder (+1/32) <u>12.98</u> | 10.66 gm. | 54.8% |
| 3. Jar (1/32-1/64) <u>2.32</u> | 1.95 gm. | 10.0% |
| 4. Drain <u>4.26</u> | 6.86 gm. | 35.2% |

C. Screen Analysis 10.53

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2+1/4 mm	7.45	70.7
1/4-1/8 mm	3.08	29.3
1/8-1/16		
Pan		
Total	10.53	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. }
 Bromoform- } 2.98 ± Sp. gr. Size-Grade(s) Pan mm.

Analyst Dean Frasché
 Date 5-17-35

Wt. of sample 3.00 gm. 100.0%

Shape Analysis:

Heavy Minerals 0.02 gm. 0.7 %

A. % : a. % : C. %

Light Minerals 2.98 gm. 99.3 %

r % : R %

Minerals Identified:
 Heavy Concentrate

No. of Grains Rel. % Classification Grouping: Absol. %
 Primary Minerals: 99.3 %

~~barite~~
~~pyrite~~

9 53 Clay minerals 75.7
16 29.7 quartz 23.6

Total 100%

Light Concentrate

Secondary Minerals: 0.7 %

Clay minerals 3200 76.2
quartz 1000 23.8

barite 0
pyrite 0.7

Total 42 100% Total 100%

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

Shale - 63% - gray-calcareous-carbonaceous -
lost by solution 36% - gray-fine crystalline
dense

DEEP WELL STUDY

MECHANICAL ANALYSIS

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

1. Sample weight	30.60 gm.	100.0%	2. Wt. of F. P.	2.37
3. Wt. after solution, with filter paper	26.54 gm.			
4. Less wt. F. P. (2)	2.37 gm.			
5. Wt. Insol. Residue (3 minus 4)	24.17 gm.	79.1%		
6. Wt. lost by solution (1 minus 5)	6.43 gm.	21.0%		
7. To balance (5 plus 6)	30.60 gm.	100.0%		

B. Subsidiation:

1. Original Wt.	24.17 gm.	100.0%
2. Cylinder (+1/32)	2.37 gm.	50.2%
3. Jar (1/32-1/64)	2.28 gm.	9.4%
4. Drain	9.77 gm.	40.4%

Well No. W- 0117
 Depth 401 to 403
 No. samples used 1
 Analyst Scott
 Date 3/1/35

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	7.88	65.65
1/4-1/8 mm	4.12	34.35
1/8-1/16		
Pan		
Total	12.00	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } 2.93± Sp. gr. Size-Grade(s) 1/4-Pan mm.

Analyst Dean Frushie
 Date 5-17-35

Wt. of sample 3.52 gm. 100.0%

Shape Analysis:

Heavy Minerals .03 gm. 0.8%

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

Light Minerals 3.49 gm. 99.1%

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

Minerals Identified; Heavy Concentrate

No. of Grains Rel. %

Classification Grouping:

Absol. %

varite	1.1	feldspar	32.5
pyrite	31	clay-minerals	26.1
Fe Agg	1.1	quartz	40.5

Total 3.52 gm. 100%

Light Concentrate

Secondary Minerals: 0.9%

feldspar	2900	32.8	varite	0.9
clay-minerals	1920	26.3	pyrite	0
quartz	3200	40.9	Fe Agg	0

Total 7320 100% Total 100%

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

Sandstone 79% gray and red calc.
 Lost by solution 21% blocky

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl...1.5...%)

- | | | | |
|--|-----------|---------|-----------------------------|
| 1. Sample weight | 30.77 gm. | 100.0% | 2. Wt. of F. P. <u>2.13</u> |
| 3. Wt. after solution, with filter paper | 27.47 gm. | | |
| 4. Less wt. F. P. (2) | 2.93 gm. | | |
| 5. Wt. Insol. Residue (3 minus 4) | 25.04 gm. | 81.4 % | |
| 6. Wt. lost by solution (1 minus 5) | 5.73 gm. | 18.6 % | |
| 7. To balance (5 plus 6) | 30.77 gm. | 100.0 % | |

Well No. W- 0117
 Depth 403 to 408
 No. samples used 1
 Analyst Scott
 Date 3/4/35

B. Subsidiary:

- | | | |
|-------------------------------|-----------|--------|
| 1. Original Wt. | 25.04 gm. | 100.0% |
| 2. Cylinder (+1/32) | 14.89 gm. | 59.4 % |
| 3. Jar (1/32-1/64) | 2.62 gm. | 10.5 % |
| 4. Drain | 7.53 gm. | 30.1 % |

C. Screen Analysis 1490

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	8.62	57.9
1/4-1/8 mm	6.27	42.1
1/8-1/16		
Pan		
Total	14.89	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } 2.93 Sp. gr. Size-Grade(s) 4-Pan mm.

Analyst Dean Frasier
 Date 3-17-35

- | | | |
|--------------------------|----------|--------|
| Wt. of sample | 3.57 gm. | 100.0% |
| Heavy Minerals | .02 gm. | 0.6 % |
| Light Minerals | 3.55 gm. | 99.4 % |

Shape Analysis:

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

Minerals Identified:
 Heavy Concentrate

No. of Grains Rel. %

Classification Grouping:

Absol. %

<u>barite</u>	17.9	Clay minerals	59.6
<u>pyrite</u>	8.921	feldspar	19.9
		quartz	19.9

Total 73 100%

Light Concentrate

Secondary Minerals: 0.6 %

<u>Clay minerals</u>	3000 60.0	<u>barite</u>	0
<u>feldspar</u>	1000 20.0	<u>pyrite</u>	0.6
<u>quartz</u>	1000 20.0		

Total 5000 100% Total 100%

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

shale - 81% - gray - calcareous - lost by solution
18% buff fine crystalline dense

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15%)

- | | | | |
|--|------------------|----------------|-----------------------------|
| 1. Sample weight | <u>31.23</u> gm. | 100.0% | 2. Wt. of F. P. <u>2.18</u> |
| 3. Wt. after solution, with filter paper | <u>21.92</u> gm. | | |
| 4. Less wt. F. P. (2) | <u>2.18</u> gm. | | |
| 5. Wt. Insol. Residue (3 minus 4) | <u>22.74</u> gm. | <u>72.5</u> % | |
| 6. Wt. lost by solution (1 minus 5) | <u>8.49</u> gm. | <u>27.2</u> % | |
| 7. To balance (5 plus 6) | <u>31.23</u> gm. | <u>100.0</u> % | |

B. Subsidiation:

- | | | | |
|---|------------------|---------------|--|
| 1. Original Wt. | <u>22.74</u> gm. | 100.0% | |
| 2. Cylinder (+1/32) <u>2.18</u> | <u>8.45</u> gm. | <u>37.1</u> % | |
| 3. Jar (1/32—1/64) <u>7.00</u>
<u>2.28</u> | <u>4.72</u> gm. | <u>20.8</u> % | |
| 4. Drain | <u>9.57</u> gm. | <u>42.1</u> % | |

Well No. W— 0117
 Depth 408 to 413
 No. samples used 7
 Analyst SCOTT
 Date 3/4/25

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm		
1/4-1/8 mm		
1/8-1/16		
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: No. of Rel. Classification Grouping: Absol. %
 Heavy Concentrate Grains % Primary Minerals: %

No Sample lost!

Total 100%
 Light Concentrate

Secondary Minerals: %

Total 100% Total 100%
 Revised Lithologic Description (from descriptive log and laboratory data).

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15%)

- | | | | | |
|--|-----------|--------|-----------------|------|
| 1. Sample weight | 30.79 gm. | 100.0% | 2. Wt. of F. P. | 2.18 |
| 3. Wt. after solution, with filter paper | 16.12 gm. | | | |
| 4. Less wt. F. P. (2) | 12.18 gm. | | | |
| 5. Wt. Insol. Residue (3 minus 4) | 13.94 gm. | 45.3% | | |
| 6. Wt. lost by solution (1 minus 5) | 16.85 gm. | 54.7% | | |
| 7. To balance (5 plus 6) | 30.79 gm. | 100.0% | | |

B. Subsidiary:

- | | | |
|---------------------|-----------|--------|
| 1. Original Wt. | 13.93 gm. | 100.0% |
| 2. Cylinder (+1/32) | 9.84 gm. | 70.6% |
| 3. Jar (1/32-1/64) | 9.9 gm. | 7.1% |
| 4. Drain | 3.10 gm. | 22.3% |

Well No. W- 0117
 Depth 413 to 422 1/2
 No. samples used 3
 Analyst Scott
 Date 4/4/35

C. Screen Analysis 9.67

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2+1/4 mm	8.67	89.7
1/4-1/8 mm		10.3
1/8-1/16		
Pan		
Total	9.67	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

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

Analyst Dean Frasche
 Date 5-18-35

Wt. of sample 00 gm. 100.0%

Shape Analysis:

Heavy Minerals 0 gm. 0 %

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

Light Minerals 99 gm. 99 %

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

Minerals Identified;
 Heavy Concentrate

No. of Grains Rel. %

Classification Grouping:

Absol. %

Primary Minerals:%

barite	30	6.5
pyrite	354	76.9
Tourmaline-green	1	.2
leucosand	3	.7
Clay-minerals	72	15.7

Tourmaline
 Clay minerals
 Quartz
 ?

Total 460 100%

Light Concentrate

Secondary Minerals:%

Clay minerals	1280	62.1
leucosand	80	3.9
Quartz	900	34.0

barite
 pyrite
 leucosand

Total 2060 100%

Total 100%

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

limestone 54% - buff to gray - fine crystalline
dense - shale 45% - gray - calc - blocky

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl...15%)

1. Sample weight	30.85 gm.	100.0%	2. Wt. of F. P.	2.38
3. Wt. after solution, with filter paper	25.57 gm.			
4. Less wt. F. P. (2)	2.38 gm.			
5. Wt. Insol. Residue (3 minus 4)	23.19 gm.	75.1%		
6. Wt. lost by solution (1 minus 5)	7.66 gm.	24.9%		
7. To balance (5 plus 6)	30.85 gm.	100.0%		

B. Subsidiary:

1. Original Wt.	23.19 gm.	100.0%
2. Cylinder (+1/32)	9.96 gm.	43.0%
3. Jar (1/32-1/64)	2.83 gm.	12.2%
4. Drain	10.40 gm.	44.8%

Well No. W- 0117
 Depth 424 to 436
 No. samples used 7
 Analyst Scott
 Date 3/4/35

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2+1/4 mm	4.73	64.1
1/4-1/8 mm	2.64	35.9
1/8-1/16		
Pan		
Total	7.37	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } 99.8 Sp. gr. Size-Grade(s) 1/4-Pan mm.

Analyst Dean Frisché
 Date 5-20-35

Wt. of sample 7.60 gm. 100.0%

Shape Analysis:

Heavy Minerals 0.005 gm. 0.5 %

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

Light Minerals 2.595 gm. 99.8 %

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

Minerals Identified; Heavy Concentrate

No. of Grains	Rel. %
8	5.3
59	39.4
7	4.7
76	50.6

Classification Grouping:

Primary Minerals: 99.8 %

Absol. %

barite
pyrite
amphibole
limonitic cl

clay minerals 99.8
amphibole 0

Total 150 100%

Light Concentrate

Secondary Minerals: 0.2 %

clay minerals 100.0 100

barite
pyrite
limonitic
 0
 .1
 .1

Total 1000 100%

Total 100%

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

Shale 79% - gray-greenish-salicyous-blocky - lost by solution 24% - liggray - fine crystalline dense

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl.....15.....%)

- | | | | | |
|--|-----------|--------|-----------------|------|
| 1. Sample weight | 30.75 gm. | 100.0% | 2. Wt. of F. P. | 2.39 |
| 3. Wt. after solution, with filter paper | 27.72 gm. | | | |
| 4. Less wt. F. P. (2) | 3.39 gm. | | | |
| 5. Wt. Insol. Residue (3 minus 4) | 25.33 gm. | 82.4% | | |
| 6. Wt. lost by solution (1 minus 5) | 5.42 gm. | 17.6% | | |
| 7. To balance (5 plus 6) | 30.75 gm. | 100.0% | | |

Well No. W— 2117
 Depth 436 to 440
 No. samples used 1
 Analyst Scott
 Date 2/4/35

B. Subsidiation:

- | | | |
|---------------------|-----------|--------|
| 1. Original Wt. | 25.33 gm. | 100.0% |
| 2. Cylinder (+1/32) | 16.31 gm. | 64.4% |
| 3. Jar (1/32—1/64) | 2.81 gm. | 11.1% |
| 4. Drain | 6.21 gm. | 24.5% |

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	7.41	45.7
1/4-1/8 mm	8.81	54.3
1/8-1/16		
Pan		
Total	16.22	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } 2.92 Sp. gr. Size-Grade(s) 1/4-Pan mm.

Analyst Dean Frische
 Date 5-20-35

Wt. of sample 3.14 gm. 100.0%

Shape Analysis:

Heavy Minerals .005 gm. 0.16%

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

Light Minerals 3.135 gm. 99.84%

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

Minerals Identified:
 Heavy Concentrate

No. of Grains Rel. %

Classification Grouping:
 Primary Minerals: 99.9%

Absol. %

barite 15.5
 pyrite 71.6
 clay-minerals 12.9

feldspar 0.5
 clay-minerals 59.6
 quartz 39.8

Total 6 100%

Light Concentrate

Secondary Minerals: 0.1%

feldspar 0.5
 clay-minerals 59.7
 quartz 100 59.8

barite 0.1
 pyrite 0
 clay mine 0

Total 401 100%

Total 100%

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

Shale 82% gray - calcareous blacky -
 lost by solution buff - fine crystalline deep

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl.....15.....%)

1. Sample weight	31.36 gm.	100.0%	2. Wt. of F. P.	2.42
3. Wt. after solution, with filter paper	9.25 gm.			
4. Less wt. F. P. (2)	2.42 gm.			
5. Wt. Insol. Residue (3 minus 4)	6.83 gm.	21.8%		
6. Wt. lost by solution (1 minus 5)	24.53 gm.	78.2%		
7. To balance (5 plus 6)	31.36 gm.	100.0%		

Well No. W- 0117
 Depth 440 to 451
 No. samples used
 Analyst Scot
 Date 3/4/35

B. Subsidiary:

1. Original Wt.	6.83 gm.	100.0%
2. Cylinder (+1/32)	4.96 gm.	72.2%
3. Jar (1/32-1/64) . . . . .	.59 gm.	8.6%
4. Drain	1.28 gm.	18.7%

C. Screen Analysis 4.96

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	1.49	29.0
1/4-1/8 mm	3.52	71.0
1/8-1/16		
Pan		
Total	4.96	100.0

MINERALOGICAL ANALYSIS

Acet. Tetrabr. Bromoform } 2.931 Sp. gr. Size-Grade(s) 4-Pan mm.

(Use opposite side of page for details of minerals)

Analyst Dean Fraschia
 Date 5-20-35

Wt. of sample	3.46 gm.	100.0%
Heavy Minerals . . . . .	.51 gm.	14.7%
Light Minerals	3.45 gm.	99.7%

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

Minerals Identified:	No. of Grains	Rel. %	Classification Grouping:	Absol. %
Heavy Concentrate			Primary Minerals: 99.8%	
barite	4	2.1	cornwalline	0
pyrite	148	78.3	garnet	0
tourmaline	1	.5	amphibole	0
garnet	1	.5	epidote	0
leucosene	4	2.1	clay minerals	61.4
amphibole	2	1.1	quartz	38.4
epidote	2	1.1		
hematite	10	5.3		
clay	17	9.0		
Total	189	100%		

Light Concentrate	No. of Grains	Rel. %	Secondary Minerals: 0.2%	Absol. %
clay minerals	1280	61.5	barite	0.2
quartz	800	38.5	pyrite	0.00
			leucosene	
			hematite	
			clay	

Total 208 : 100% Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).
 limestone 78% light gray fine crystalline dense
 shale 21% - calcareous

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl...15%...)

- | | | | | |
|--|-----------|--------|-----------------|------|
| 1. Sample weight | 30.12 gm. | 100.0% | 2. Wt. of F. P. | 2.51 |
| 3. Wt. after solution, with filter paper | 24.31 gm. | | | |
| 4. Less wt. F. P. (2) | 2.51 gm. | | | |
| 5. Wt. Insol. Residue (3 minus 4) | 22.80 gm. | 75.7% | | |
| 6. Wt. lost by solution (1 minus 5) | 7.32 gm. | 24.3% | | |
| 7. To balance (5 plus 6) | 30.12 gm. | 100.0% | | |

B. Subsidiation:

- | | | |
|---------------------|-----------|--------|
| 1. Original Wt. | 22.80 gm. | 100.0% |
| 2. Cylinder (+1/32) | 10.76 gm. | 47.2% |
| 3. Jar (1/32-1/64) | 2.95 gm. | 13.0% |
| 4. Drain | 9.09 gm. | 39.8% |

Well No. W- 2117
 Depth 454 to 459
 No. samples used 2
 Analyst Scott
 Date 3/4/35

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1-1/4 mm	6.08	57.1
1/4-1/8 mm	4.56	42.9
1/8-1/16		
Pan		
Total	10.64	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } 93± Sp. gr. Size-Grade(s) Pan mm.

Analyst Dean Frasca
 Date 5-21-35

Wt. of sample 3.25 gm. 100.0%

Shape Analysis:

Heavy Minerals .03 gm. %

A. %: a. %: C. %

Light Minerals 3.22 gm. 99.1 %

r. %: R. %

Minerals Identified; Heavy Concentrate

No. of Grains

Rel. %

Classification Grouping:

Absol. %

Primary Minerals: 99.1 %

barite
 pyrite
 clay

5	1.8
223	78.5
5	19.7

Clay minerals 18.2
 Quartz 20.9

Total 3.25 gm. 100%

Light Concentrate

Secondary Minerals: %

Clay minerals (pyrite)
 quartz

2100	78.9
560	21.1

barite
 pyrite
 clay
 0
 .7
 .2

Total 3.25 gm. 100%

Total 100%

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

Shale 75% gray - calcareous blacky - carb-
 lime stone - light to dark gray to black - fossilif-
 erous.

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15%)

1. Sample weight	31.65 gm.	100.0%	2. Wt. of F. P.	2.17
3. Wt. after solution, with filter paper	9.98 gm.			
4. Less wt. F. P. (2)	2.17 gm.			
5. Wt. Insol. Residue (3 minus 4)	7.81 gm.	24.7%		
6. Wt. lost by solution (1 minus 5)	23.84 gm.	75.3%		
7. To balance (5 plus 6)	31.65 gm.	100.0%		

B. Subsidiary:

1. Original Wt.	23.84 gm.	100.0%
2. Cylinder (+1/32)	6.82 gm.	28.6%
3. Jar (1/32-1/64)	1.9 gm.	8.0%
4. Drain	16.83 gm.	70.6%

Well No. W- D117
 Depth 462 to 469
 No. samples used 1
 Analyst Scott
 Date 3/4/35

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2-1 mm		
ϕ-1/2 mm	3.11	45.2
1/2-1/4 mm	1.69	23.9
1/4-1/8 mm	1.26	18.3
1/8-1/16 Pan	5.87	12.6
Pan		
Total	6.88	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } 2.93± Sp. gr. Size-Grade(s) pan mm.

Analyst Dean Frasche
 Date 5-21-35

Wt. of sample 9.0 gm. 100.0% Shape Analysis:

Heavy Minerals .03 gm. 0.3% A.....%: a.....%: C.....%

Light Minerals .87 gm. 99.7% r.....%: R.....%

Minerals Identified; Heavy Concentrate No. of Grains Rel. % Classification Grouping: Primary Minerals: 99.7% Absol. %

barite			zircon		
pyrite	29	3.2	tourmaline		0
zircon	808	89.0	garnet		0
tourmaline	1	.1	amphibole		0
garnet	1	.1	epidote		0
leucosene	4	.4	muscovite		0
amphibole	2	.2	clay minerals		13.5
epidote	1	.1	feldspars		18.8
muscovite	1	.1	quartz		67.4
clay-Fe	61	6.6			
Total	919	100%			

Light Concentrate			Secondary Minerals: <u>0.3</u> %	
clay minerals	160	13.5	barite	0
feldspars	224	18.9	pyrite	0.3
quartz	800	67.5	leucosene	0

Total 1184 100% Total 100%

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

limestone-75% buff fine crystalline dense shale 24.7%
 gray-green calcareous fossiliferous spinoid stems(?)
 fusulinid - much quartz - 1/8 - 1/4 mm.

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15%)

- | | | | |
|--|------------------|--------|-----------------------------|
| 1. Sample weight | <u>29.53</u> gm. | 100.0% | 2. Wt. of F. P. <u>2.42</u> |
| 3. Wt. after solution, with filter paper | <u>23.87</u> gm. | | |
| 4. Less wt. F. P. (2) | <u>2.10</u> gm. | | |
| 5. Wt. Insol. Residue (3 minus 4) | <u>21.47</u> gm. | 72.7% | |
| 6. Wt. lost by solution (1 minus 5) | <u>8.06</u> gm. | 27.3% | |
| 7. To balance (5 plus 6) | <u>29.53</u> gm. | 100.0% | |

B. Subsidiary:

- | | | |
|----------------------------------|------------------|--------|
| 1. Original Wt. | <u>21.47</u> gm. | 100.0% |
| 2. Cylinder (+1/32) <u>14.72</u> | <u>12.39</u> gm. | 57.7% |
| 3. Jar (1/32—1/64) <u>2.33</u> | <u>1.75</u> gm. | 8.2% |
| 4. Drain <u>4.07</u> | <u>7.33</u> gm. | 34.1% |

Well No. W— 0117

Depth 464 to 468

No. samples used

Analyst Scott

Date 3/4/55

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	8.71	70.8
1/4-1/8 mm	3.59	29.2
1/8-1/16		
Pan		
Total	<u>12.30</u>	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. }
 Bromoform } 1.92 Sp. gr. Size-Grade(s) 1/4-Pan mm.

Analyst Dan Frasca

Date 5-22-55

Wt. of sample 5.58 gm. 100.0% Shape Analysis:

Heavy Minerals 0.15 gm. % A %: a %: C %

Light Minerals 5.365 gm. 99.7% r %: R %

Minerals Identified:	No. of Grains	Rel. %	Classification Grouping:	Absol. %
Heavy Concentrate			Primary Minerals: <u>99.7</u> %	
<u>clay minerals</u>	<u>201</u>	<u>99.8</u>	<u>Clay minerals</u>	<u>99.7</u>
<u>quartz</u>	<u>1</u>	<u>.2</u>		

Total 761 100%

Light Concentrate

Secondary Minerals: %

clay minerals 100

quartz %
pyrite %

Total 100% Total 100%

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

Shale 22% - gray to red calcareous laminar 22%
light gray finely crystalline dense fossiliferous
clay - bituminous - Eastwood

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15%)

- | | | | | |
|--|------------------|---------------|-------------------------|--|
| 1. Sample weight | <u>31.97</u> gm. | 100.0% | 2. Wt. of F. P. | |
| 3. Wt. after solution, with filter paper | <u>30.91</u> gm. | | | |
| 4. Less wt. F. P. (2) | <u>2.51</u> gm. | | | |
| 5. Wt. Insol. Residue (3 minus 4) | <u>28.40</u> gm. | <u>88.9%</u> | | |
| 6. Wt. lost by solution (1 minus 5) | <u>3.57</u> gm. | <u>11.1%</u> | | |
| 7. To balance (5 plus 6) | <u>31.97</u> gm. | <u>100.0%</u> | | |

Well No. W- 0117
 Depth 4.68 to 4.70
 No. samples used 2
 Analyst Scott
 Date 3/4/35

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	<u>12.15</u>	<u>67.5</u>
1/4-1/8 mm	<u>5.89</u>	<u>32.5</u>
1/8-1/16		
Pan		
Total	<u>18.02</u>	<u>100.0</u>

B. Subsidiary:

- | | | | | |
|-------------------------------|------------------|--------------|------------------|--------------|
| 1. Original Wt. | <u>28.40</u> gm. | 100.0% | | |
| 2. Cylinder (+1/32) | <u>2.30</u> | | <u>18.12</u> gm. | <u>63.8%</u> |
| 3. Jar (1/32-1/64) | <u>3.20</u> | | <u>.90</u> gm. | <u>3.2%</u> |
| 4. Drain | <u>9.38</u> gm. | <u>33.0%</u> | | |

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } 2.92± Sp. gr. Size-Grade(s) 1/4-Pan mm.

Analyst Dean Frasca
 Date 5-22-35

Wt. of sample 15 gm. 100.0%

Shape Analysis:

Heavy Minerals02 gm.6%

A %: a %: C %

Light Minerals 3.13 gm. 99.4%

r %: R %

Minerals Identified: Heavy Concentrate

No. of Grains	Rel. %	Classification Grouping:
		Primary Minerals: <u>99.4%</u>
<u>7</u>	<u>.2</u>	<u>fluorite</u>
<u>32</u>	<u>2.0</u>	<u>leucocrinite</u>
<u>1077</u>	<u>92.8</u>	<u>garnet</u>
<u>2</u>	<u>.2</u>	<u>amphibole</u>
<u>3</u>	<u>.3</u>	<u>epidote</u>
<u>2</u>	<u>.2</u>	<u>clay mineral</u>
<u>9</u>	<u>.6</u>	
<u>1</u>	<u>.1</u>	
<u>41</u>	<u>3.6</u>	
Total	1156	100%

Secondary Minerals: %

Absol. %

fluorite
leucocrinite
pyrite
leucocrinite
garnet
leucocrinite
amphibole
epidote
leucocrinite

fluorite
leucocrinite
garnet
amphibole
epidote
clay mineral

0
0
0
0
99.4

Light Concentrate
clay mineral

pyrite
leucocrinite
leucocrinite

0
0
0
0
0.6

Total 100% Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).
Shale - 88% dark gray to black - carbonaceous
limestone 11% buff fine crystalline dense

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15%)

- | | | | |
|--|------------------|---------------|-----------------------------|
| 1. Sample weight | <u>30.28</u> gm. | 100.0% | 2. Wt. of F. P. <u>2.28</u> |
| 3. Wt. after solution, with filter paper | <u>20.39</u> gm. | | |
| 4. Less wt. F. P. (2) | <u>2.38</u> gm. | | |
| 5. Wt. Insol. Residue (3 minus 4) | <u>18.01</u> gm. | <u>59.6%</u> | |
| 6. Wt. lost by solution (1 minus 5) | <u>12.27</u> gm. | <u>40.4%</u> | |
| 7. To balance (5 plus 6) | <u>30.28</u> gm. | <u>100.0%</u> | |

B. Subsidiary:

- | | | | |
|----------------------------------|------------------|--------------|--|
| 1. Original Wt. | <u>18.01</u> gm. | 100.0% | |
| 2. Cylinder (+1/32) <u>13.52</u> | <u>11.28</u> gm. | <u>62.6%</u> | |
| 3. Jar (1/32-1/64) <u>3.66</u> | <u>1.28</u> gm. | <u>7.1%</u> | |
| 4. Drain <u>2.38</u> | <u>5.45</u> gm. | <u>30.3%</u> | |

Well No. W- 0117
 Depth 470 to 478
 No. samples used 3
 Analyst Scott
 Date 3/1/35

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	<u>8.73</u>	<u>77.5</u>
1/4-1/8 mm	<u>2.25</u>	<u>20.5</u>
1/8-1/16		
Pan		
Total	<u>98</u>	<u>100.0</u>

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } 99.3 Sp. gr. Size-Grade(s) 1/4-Pan mm.

Analyst Dean Frische
 Date 2-3-35

Wt. of sample 2.30 gm. 100.0% Shape Analysis:

Heavy Minerals 0.01 gm. 0.4% A %: a %: C %

Light Minerals 2.29 gm. 99.6% r %: R %

Minerals Identified; Heavy Concentrate	No. of Grains	Rel. %	Classification Grouping: Primary Minerals: <u>99.1%</u>	Absol. %
<u>barite</u>	<u>13</u>	<u>3.8</u>	<u>cyanite</u>	0
<u>pyrite</u>	<u>202</u>	<u>60.0</u>	<u>garnet</u>	0
<u>cyanite</u>	<u>1</u>	<u>3</u>	<u>amphibole</u>	0
<u>garnet</u>	<u>1</u>	<u>3</u>	<u>clay minerals</u>	<u>95.1</u>
<u>amphibole</u>	<u>1</u>	<u>3</u>	<u>quartz</u>	<u>4.6</u>
<u>limonite</u>	<u>1</u>	<u>35.3</u>		

Total 3 = 7 100%

Light Concentrate

Secondary Minerals: 0.2%

<u>clay minerals</u>	<u>1360</u>	<u>95.4</u>	<u>barite</u>	0
<u>quartz</u>	<u>64</u>	<u>4.6</u>	<u>pyrite</u>	<u>0.2</u>
			<u>limonite</u>	<u>0.1</u>

Total 1424 100% Total 100%

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

Shale 59% - light gray greenish calcareous - some quartz present. Limestone 40% buff fine crystalline dense.

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15%)

- | | | | |
|--|-----------|--------|----------------------|
| 1. Sample weight | 29.73 gm. | 100.0% | 2. Wt. of F. P. 2.19 |
| 3. Wt. after solution, with filter paper | 22.64 gm. | | |
| 4. Less wt. F. P. (2) | 2.19 gm. | | |
| 5. Wt. Insol. Residue (3 minus 4) | 20.45 gm. | 68.8% | |
| 6. Wt. lost by solution (1 minus 5) | 9.28 gm. | 31.2% | |
| 7. To balance (5 plus 6) | 29.73 gm. | 100.0% | |

Well No. W-011.7
 Depth 478 to 494
 No. samples used
 Analyst Scott
 Date 4/1/35

B. Subsidiation:

- | | | | |
|-------------------------------|-----------|--------|--|
| 1. Original Wt. | 20.45 gm. | 100.0% | |
| 2. Cylinder (+1/32) | 2.31 gm. | 11.3% | |
| 3. Jar (1/32-1/64) | 5.03 gm. | 24.6% | |
| 4. Drain | 8.99 gm. | 43.9% | |

C. Screen Analysis 270

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1-1/4 mm	6.16	71.3
1/4-1/8 mm	2.40	28.7
1/8-1/16		
Pan		
Total	8.64	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } 2.93 gm. Sp. gr. Size-Grade(s) 1/4-Pan mm.

Analyst Dean Frasca
 Date 5-23-35

Wt. of sample 2.30 gm. 100.0% Shape Analysis:

Heavy Minerals01 gm. .4% A. %: a %: C %

Light Minerals 2.29 gm. 99.6% r %: R %

Minerals Identified: Heavy Concentrate No. of Grains Rel. % Classification Grouping: Primary Minerals: 99.6% Absol. %

white	4	2.2	quartz	0
pyrite	128	69.9	amphibole	0
quartz	2	1.1	epidote	0
amphibole	4	2.2	clay minerals	98.0
epidote	7	1.6	quartz	
clay minerals	12	23.0		

Total 183 100%

Light Concentrate
 Clay-min. 1600 98.4
 quartz 24 1.6
 Secondary Minerals: 0.4%
 quartz 0
 pyrite 0.3
 clay-min. 0.1

Total 100% Total 100%

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

31% light gray fine crystalline dense
 68% dark gray calcareous - unconsolidated

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15%)

1. Sample weight 29.79 gm. 100.0%: 2. Wt. of F. P.

3. Wt. after solution, with filter paper 19.99 gm.

4. Less wt. F. P. (2) 2.19 gm.

5. Wt. Insol. Residue (3 minus 4) 17.80 gm. 59.9%

6. Wt. lost by solution (1 minus 5) 11.99 gm. 40.1%

7. To balance (5 plus 6) 29.79 gm. 100.0%

Well No. W— 2117

Depth 494 to 496

No. samples used 1

Analyst Scott

Date 3/4/35

B. Subsidiation:

1. Original Wt. 17.80 gm. 100.0%

2. Cylinder (+1/32) 14.55 12.21 gm. 68.7%
2.34

3. Jar (1/32—1/64) 3.66 1.52 gm. 8.5%

4. Drain 4.07 gm. 22.8%

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1-1/4 mm	<u>7.28</u>	<u>60.0</u>
1/4-1/8 mm	<u>4.85</u>	<u>40.0</u>
1/8-1/16		
Pan		
Total	<u>12.1</u>	<u>100.0</u>

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. }
Bromoform } 2.934 Sp. gr. Size-Grade(s) 1/4 Pan mm.

Analyst Dean Fraschi

Date 5-24-1

Wt. of sample 3.05 gm. 100.0% Shape Analysis:

Heavy Minerals015 gm. 0.5% A. %: a. %: C. %

Light Minerals 0.35 gm. 99.5% r %: R %.

Minerals Identified;	No. of Grains	Rel. %	Classification Grouping:	Absol. %
Heavy Concentrate			Primary Minerals: <u>99.5</u> %	
<u>barite</u>	<u>5</u>	<u>2.8</u>	<u>Zircon</u>	
<u>pyrite</u>	<u>168</u>	<u>96.4</u>	<u>Gal. net</u>	
<u>zircon</u>	<u>1</u>	<u>.6</u>	<u>Amphibole</u>	
<u>garnet</u>	<u>1</u>	<u>.6</u>	<u>Clay-minerals</u>	<u>98.4</u>
<u>amphibole</u>	<u>1</u>	<u>.6</u>	<u>quartz</u>	<u>1.1</u>

Total	<u>176</u>	<u>100</u> %		
Light Concentrate			Secondary Minerals: <u>0.5</u> %	
<u>Clay minerals</u>	<u>111</u>	<u>98.9</u>	<u>barite</u>	<u>0.5</u>
<u>quartz</u>	<u>1</u>	<u>.1</u>	<u>pyrite</u>	<u>0.5</u>

Total 129.2 100% Total 100%

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

Sp. 59% dark gray to black calcareous

limestone 40% fine crystalline dense

DEEP WELL STUDY

MECHANICAL ANALYSIS

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

1. Sample weight	19.43 gm.	100.0%	2. Wt. of F. P.	2.37
3. Wt. after solution, with filter paper	15.91 gm.			
4. Less wt. F. P. (2)	2.37 gm.			
5. Wt. Insol. Residue (3 minus 4)	13.54 gm.	66.5%		
6. Wt. lost by solution (1 minus 5)	6.89 gm.	33.5%		
7. To balance (5 plus 6)	20.43 gm.	100.0%		

B. Subsidiary:

1. Original Wt.	13.54 gm.	100.0%
2. Cylinder (+1/32)	6.57 gm.	4.30 gm. 31.8%
3. Jar (1/32-1/64)	5.10 gm.	2.79 gm. 20.6%
4. Drain	2.31 gm.	6.45 gm. 47.6%

Well No. W- 0117
 Depth 498 to 503
 No. samples used 2
 Analyst Scott
 Date 3/11/35

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	1.16	27.0
1/4-1/8 mm	3.14	73.0
1/8-1/16		
Pan		
Total	4.30	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } 2.93± Sp. gr. Size-Grade(s) 1/4 Pan mm.

Analyst KUNDERT
 Date MAY 16, 1935

Wt. of sample	3.08 gm.	100.0%
Heavy Minerals	.01 gm.	0.3%
Light Minerals	3.07 gm.	99.7%

Shape Analysis:

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

Minerals Identified; Heavy Concentrate

No. of Grains Rel. % Classification Grouping: Absol. %
 Primary Minerals: 94.3%

Pyrite	180	79.3	Hornblende	
Leucoxene	5	2.2	Clay Minerals	85.2
Hornblende	1	0.4	Feldspars	0.5
Clay Aggregates	41	18.1	Quartz	8.6

Total 227 100%

Light Concentrate

Chert	60	5.4
Clay Minerals	945	85.5
Feldspar	5	0.5
Quartz	95	8.6

Secondary Minerals: 5.7%

Pyrite	0.2
Leucoxene	
Chert	5.4
Clay Agg	0.1

Total 1105 100% Total 100%

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

shale - 95-100% red + grayish green, calcareous, 30-40% soluble, blocky; 1/2-1-5" + buff, finely x-lime -

DEEP WELL STUDY

MECHANICAL ANALYSIS

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

1. Sample weight 20.57 gm. 100.0%: 2. Wt. of F. P. 2.33
3. Wt. after solution, with filter paper 18.60 gm.
4. Less wt. F. P. (2) 33 gm.
5. Wt. Insol. Residue (3 minus 4) 16.27 gm. 79.1%
6. Wt. lost by solution (1 minus 5) 4.30 gm. 20.9%
7. To balance (5 plus 6) 20.57 gm. 100.0%

B. Subsidiation:

1. Original Wt. 16.27 gm. 100.0%
2. Cylinder (+1/32) 7.95 5.81 gm. 35.7%
3. Jar (1/32—1/64) 2.14 5.09 2.70 gm. 16.6%
4. Drain 2.39 7.76 gm. 47.7%

Well No. W— 0111

Depth 502 to 505

No. samples used 1

Analyst Scott

Date 3/11/35

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	<u>1.84</u>	<u>35.5</u>
1/4-1/8 mm	<u>3.66</u>	<u>66.5</u>
1/8-1/16		
Pan		
Total	<u>5.50</u>	<u>100.0</u>

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } 2.92 ± Sp. gr. Size-Grade(s) 1/4 Pan mm.

Analyst KUHDEBT

Date MAY 16, 1935

Wt. of sample 3.53 gm. 100.0% Shape Analysis:

Heavy Minerals01 gm. 0.3% A.....%: a.....%: C.....%

Light Minerals 3.52 gm. 99.7% r.....%: R.....%

Minerals Identified:
Heavy Concentrate

No. of Grains	Rel. %
<u>110</u>	<u>31.9</u>
<u>2</u>	<u>0.7</u>
<u>3</u>	<u>0.7</u>
<u>3</u>	<u>1.0</u>
<u>1</u>	<u>0.3</u>
<u>2</u>	<u>0.7</u>
<u>1</u>	<u>0.3</u>
<u>4</u>	<u>1.4</u>
<u>165</u>	<u>57.0</u>
<u>290</u>	<u>100%</u>

Classification Grouping:

Primary Minerals: 90.1%

Absol. %

Pyrite
Sphalerite
Silicon-Unzoned
Garnet
Barite
Augite
Epidote
Hornblende
Clays

Augite
Garnet
Zircon
Clay Minerals
Quartz

90.1

Light Concentrate

Chert
Clay Minerals
Chert

Secondary Minerals: 9.9%

<u>45</u>	<u>4.8</u>	<u>Epidote</u>
<u>855</u>	<u>90.4</u>	<u>Barite</u>
<u>45</u>	<u>4.8</u>	<u>Hornblende</u>
		<u>Sphalerite</u>
		<u>Pyrite</u>
		<u>Chert</u>
<u>945</u>	<u>100%</u>	<u>Clays</u>

0.1

9.9

0.1

100%

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

Shale - 95-100% red, calcareous, 30% soluble,
Limestone 1-5% buff, finely crystalline

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl) 15.....%

- | | | | |
|--|------------------|----------------|-----------------------------|
| 1. Sample weight | <u>20.10</u> gm. | 100.0% | 2. Wt. of F. P. <u>2.33</u> |
| 3. Wt. after solution, with filter paper | <u>16.78</u> gm. | | |
| 4. Less wt. F. P. (2) | <u>2.33</u> gm. | | |
| 5. Wt. Insol. Residue (3 minus 4) | <u>14.45</u> gm. | <u>71.9</u> % | |
| 6. Wt. lost by solution (1 minus 5) | <u>5.65</u> gm. | <u>28.1</u> % | |
| 7. To balance (5 plus 6) | <u>0.10</u> gm. | <u>100.0</u> % | |

B. Subsidiation:

- | | | | |
|---------------------------------|------------------|---------------|--|
| 1. Original Wt. | <u>14.45</u> gm. | 100.0% | |
| 2. Cylinder (+1/32) <u>9.28</u> | <u>6.91</u> gm. | <u>47.9</u> % | |
| 3. Jar (1/32—1/64) <u>2.37</u> | | | |
| 4. Drain <u>1.58</u> | | | |
| 5. Jar (1/32—1/64) <u>2.78</u> | | <u>15.9</u> % | |
| 6. Drain <u>5.24</u> | | <u>36.1</u> % | |

Well No. W— 0.1.7
 Depth 505 to 510
 No. samples used 3
 Analyst Scott
 Date 3/11/35

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	<u>3.71</u>	<u>55.2</u>
1/4-1/8 mm	<u>3.01</u>	<u>44.8</u>
1/8-1/16		
Pan		
Total	<u>6.72</u>	<u>100.0</u>

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } 2.33± Sp. gr. Size-Grade(s) 14 Pan mm.

Analyst KÜNDERT
 Date MAY 17, 1935

Wt. of sample 2.98 gm. 100.0% Shape Analysis:

Heavy Minerals 0.01 gm. 0.3 % A.....%: a.....%: C.....%

Light Minerals 2.97 gm. 99.7 % r.....%: R.....%

Minerals Identified; Heavy Concentrate No. of Grains Rel. % Classification Grouping: Primary Minerals: 97.0 % Absol. %

Mineral	No. of Grains	Rel. %	Classification	Absol. %
* Pyrite	590	88.2	Zircon-Unzoned	
Zircon-Unzoned	4	0.6	Garnet	
Jourmaline-Brown	1	0.1	Jourmaline-Brown	
-Green	1	0.1	"-Green	
Garnet	2	0.3	Auriferous	
Epidote	1	0.1	Clay Minerals	89.0
Auriferous	1	0.1	Quartz	8.0
Clay Aggregates	110	15.5		
Total	710	100%		

Mineral	No. of Grains	Rel. %	Classification	Absol. %
Light Concentrate			Secondary Minerals: <u>3.0</u> %	
Chert	25	2.2	Epidote	
Clay Minerals	1010	89.4	Pyrite	0.3
Glaucouite	4	0.4	Chert	2.2
Quartz	90	8.0	Glaucouite	0.4
			Clay Agg	0.1
Total	1129	100%	Total	100%

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

Shale - 95-100% grey, greenish; calcareous, 30%± soluble, friable, limestone 1-5% buff, medium crystalline, sandy

*over

* Very large percentage of Pyrite globular,
botryoidal —

DEEP WELL STUDY

MECHANICAL ANALYSIS

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

- | | | | |
|--|-----------|--------|-----------------------------|
| 1. Sample weight | 20.66 gm. | 100.0% | 2. Wt. of F. P. <u>2.31</u> |
| 3. Wt. after solution, with filter paper | 17.67 gm. | | |
| 4. Less wt. F. P. (2) | 2.31 gm. | | |
| 5. Wt. Insol. Residue (3 minus 4) | 15.36 gm. | 74.3% | |
| 6. Wt. lost by solution (1 minus 5) | 5.30 gm. | 25.7% | |
| 7. To balance (5 plus 6) | 20.66 gm. | 100.0% | |

B. Subsidiation:

- | | | | |
|--|-----------|--------|--|
| 1. Original Wt. | 15.36 gm. | 100.0% | |
| 2. Cylinder (+1/32) <u>5.83</u>
<u>2.37</u> | 3.46 gm. | 22.5% | |
| 3. Jar (1/32—1/64) <u>4.91</u>
<u>2.23</u> | . gm. | 17.5% | |
| 4. Drain | 9.22 gm. | 60.0% | |

Well No. W— <u>0117</u>
Depth <u>510</u> to <u>516 1/2</u>
No. samples used <u>2</u>
Analyst <u>Scott</u>
Date <u>3/14/35</u>

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	1.59	45.2
1/4-1/8 mm	1.87	54.8
1/8-1/16		
Pan		
Total	3.41	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } 2.92± Sp. gr. Size—Grade(s) 14 Pan mm.

Analyst KUNDERT
Date MAY 17, 1935

Wt. of sample 1.81 gm. 100.0% Shape Analysis:

Heavy Minerals01 gm. 0.6 % A.....%: a.....%: C.....%

Light Minerals 1.80 gm. 99.4 % r.....%: R.....%

Minerals Identified: Heavy Concentrate No. of Grains Rel. % Classification Grouping: Primary Minerals: 99.5 % Absol. %

Minerals Identified: Heavy Concentrate	No. of Grains	Rel. %	Classification Grouping: Primary Minerals:	Absol. %
Barite	510	1.7	Auriferous	
Pyrite	528	89.4	Barite	
Zircon-Unzoned		0.2	Hornblende	
Garnet		0.2	Garnet	
Auriferous		0.2	Zircon-Unzoned	
Hornblende	14	1.2	Cyanite	
Scale		2.4	Clay Minerals	88.8
* Limonitic Aggregates	27	4.6	Quartz	7.3
Cyanite		0.1	Chert	2.4
Total	590	100%		

Light Concentrate	No. of Grains	Rel. %	Classification Grouping: Secondary Minerals:	Absol. %
Chert	42	3.4	Pyrite	0.5
Clay Minerals	1100	89.3	Scale	
Quartz	90	7.3	Limonitic Aggregates	
Total	1232	100%		

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

Shale—95-100% dark gray, calcareous, 25% soluble;
Limestone 1-5% gray finely crystalline—

* (over)

* Limonitic Aggregates - Includes all concretionary, earthy, and massive forms of altered pyrite, magnetite, etc. and all earthy masses surrounding a limonitic nucleus -

Kundert

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl...15...%)

1. Sample weight	20.85 gm.	100.0%	2. Wt. of F. P. <u>2.16</u>
3. Wt. after solution, with filter paper	15.95 gm.		
4. Less wt. F. P. (2)	2.16 gm.		
5. Wt. Insol. Residue (3 minus 4)	13.79 gm.	66.1%	
6. Wt. lost by solution (1 minus 5)	7.06 gm.	33.9%	
7. To balance (5 plus 6)	20.85 gm.	100.0%	

B. Subsidiation:

1. Original Wt.	13.79 gm.	100.0%
2. Cylinder (+1/32)	1.97 gm.	36.1%
3. Jar (1/32—1/64)	2.72 gm.	20.2%
4. Drain	6.01 gm.	43.7%

Well No. W— 0117

Depth 516± to 520±

No. samples used

Analyst Scott

Date 3/11/35

C. Screen Analysis 4.85

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1-1/4 mm	1.66	33.8
1/4-1/8 mm	3.26	66.2
1/8-1/16		
Pan		
Total	4.92	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } 2.93± Sp. gr. Size-Grade(s) 1/4 Pan mm.

Analyst KUNDEBT

Date MAY 23, 1935

Wt. of sample 3.26 gm. 100.0% Shape Analysis:

Heavy Minerals02 gm. .6 % A. %: a %: C %

Light Minerals 3.24 gm. 99.4 % r %: R %.

Minerals Identified:
Heavy Concentrate

No. of Grains Rel. %

Classification Grouping:

Absol. %

Barite	4	0.2
Pyrite	1600	95.3
Zircon-Unzoned	3	0.2
Leucoxene	21	1.2
Hornblende	3	0.2
Epidote	4	0.2
Limonitic Aggregates	45	2.7
Total	1680	100%

Primary Minerals: <u>95.1</u> %	
Barite	
Zircon-Unzoned	
Hornblende	
Epidote	
Clay Minerals	86.8
Quartz	9.8

Light Concentrate		
Chert	25	4.3
Clay Minerals	500	86.3
Quartz	55	9.4

Secondary Minerals: <u>4.9</u> %	
Pyrite	0.6
Leucoxene	
Limonitic Agg	
Chert	4.8

Total 580 100% Total 100%

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

shale - 95-100% dark gray to black, calcareous,
35% soluble, limestone 1-5% gray finely striae,
dense - fossiliferous,

DEEP WELL STUDY

MECHANICAL ANALYSIS

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

- | | | | |
|--|-----------|--------|-----------------------------|
| 1. Sample weight | 20.71 gm. | 100.0% | 2. Wt. of F. P. <u>2.23</u> |
| 3. Wt. after solution, with filter paper | 16.43 gm. | | |
| 4. Less wt. F. P. (2) | 2.23 gm. | | |
| 5. Wt. Insol. Residue (3 minus 4) | 14.20 gm. | 69.6% | |
| 6. Wt. lost by solution (1 minus 5) | 5.51 gm. | 31.4% | |
| 7. To balance (5 plus 6) | 20.71 gm. | 100.0% | |

B. Subsidiation:

- | | | | |
|---|----------|--------|--|
| 1. Original Wt. | 1420 gm. | 100.0% | |
| 2. Cylinder (+1/32) <u>2.33</u> <u>2.20</u> | 6.13 gm. | 43.2% | |
| 3. Jar (1/32—1/64) <u>5.00</u> <u>2.37</u> | 2.6 gm. | 18.5% | |
| 4. Drain | 5.44 gm. | 38.3% | |

Well No. W- 0117
 Depth 520 1/2 to 524
 No. samples used
 Analyst Scott
 Date 3/11/35

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	3.05	52.3
1/4-1/8 mm	2.79	47.7
1/8-1/16	}	
Pan		
Total	5.84	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } 2.92 ± Sp. gr. Size-Grade(s) 14 Pan mm.

Analyst KUNDERT
 Date MAY 24, 1935

Wt. of sample 2.78 gm. 100.0% Shape Analysis:

Heavy Minerals01 gm. 0.4 % A. %: a %: C %

Light Minerals 2.77 gm. 99.6 % r %: R %.

Minerals Identified: No. of Grains Rel. % Classification Grouping: Absol. %

Heavy Concentrate

Pyrite
Leucoxene
Epidote
Chlorite
Limonic Aggregates

402	87.6
5	1.1
1	0.2
1	0.2
50	10.9

Primary Minerals: 97.0 %

Epidote	
Clay Minerals	87.9
Quartz	9.1

Total 4.59 100%

Light Concentrate

Chert
Clay Minerals
Quartz

25	2.7
825	88.2
85	9.1

Secondary Minerals: 2.0 %

Chlorite	
Pyrite	0.3
Leucoxene	
Limonic Aggregates	
Chert	2.7

Total 9.35 100% Total 100%

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

shale - 95-100% gray calcareous, 30-40% soluble, blocky;
limestone 1-5% grey, finely crystalline, dense

DEEP WELL STUDY

MECHANICAL ANALYSIS

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

- | | | | | |
|--|-----------|--------|-----------------|------|
| 1. Sample weight | 20.56 gm. | 100.0% | 2. Wt. of F. P. | 2.36 |
| 3. Wt. after solution, with filter paper | 11.88 gm. | | | |
| 4. Less wt. F. P. (2) | 2.36 gm. | | | |
| 5. Wt. Insol. Residue (3 minus 4) | 9.52 gm. | 46.3 % | | |
| 6. Wt. lost by solution (1 minus 5) | 11.04 gm. | 53.7 % | | |
| 7. To balance (5 plus 6) | 20.56 gm. | 100 % | | |

Well No. W- 0117
 Depth 524 to 528
 No. samples used 1
 Analyst Scott
 Date 3/1/35

B. Subsidiary:

- | | | | | |
|-------------------------------|----------|--------|--|--|
| 1. Original Wt. | 9.52 gm. | 100.0% | | |
| 2. Cylinder (+1/32) | 6.18 gm. | 64.9 % | | |
| 3. Jar (1/32-1/64) | 1.02 gm. | 10.7 % | | |
| 4. Drain | 2.32 gm. | 24.4 % | | |

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1-1/4 mm	2.04	33.6
1/4-1/8 mm	4.02	66.4
1/8-1/16		
Pan		
Total	6.06	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. }
 Bromoform } Sp. gr. 2.22 ±
 Size-Grade(s) 1/4 Pan mm.

Analyst KUNDERT
 Date MAY 27, 1935

Wt. of sample 3.41 gm. 100.0% Shape Analysis:

Heavy Minerals 1.01 gm. 29.3 % A. %: a %: C %

Light Minerals 3.40 gm. 99.7 % r %: R %.

Minerals Identified: No. of Grains Rel. % Classification Grouping: Absol. %

Heavy Concentrate Primary Minerals: 96.8%

Pyrite
 Zircon-Unzoned
 Chlorite
 Limonite Aggregate

392	80.4	Zircon-Unzoned	
5	1.0	Clay Minerals	84.5
6	1.2	Quartz	7.3
85	17.4		

Total 4.88 100%

Light Concentrate
 Chert
 Clay Minerals
 Quartz

50	2.9	Pyrite	
1575	89.8	Chlorite	0.2
128	7.3	Limonite Aggregate	0.1
		Chert	2.9

Total 1753 100% Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).
 shale - 90-100% dark gray, greenish, calcareous
 30-40% soluble, limestone 1-10% buff finely crystalline, dense, fossiliferous, crinoid stems

DEEP WELL STUDY

MECHANICAL ANALYSIS

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

- | | | | | |
|--|-----------|---------|-----------------|------|
| 1. Sample weight | 30.77 gm. | 100.0% | 2. Wt. of F. P. | 2.33 |
| 3. Wt. after solution, with filter paper | 9.93 gm. | | | |
| 4. Less wt. F. P. (2) | 2.33 gm. | | | |
| 5. Wt. Insol. Residue (3 minus 4) | 7.60 gm. | 24.7 % | | |
| 6. Wt. lost by solution (1 minus 5) | 3.17 gm. | 75.3 % | | |
| 7. To balance (5 plus 6) | 30.77 gm. | 100.0 % | | |

Well No, W- 017
 Depth 528 to 538
 No. samples used 3
 Analyst Scott
 Date 3/11/35

B. Subsidiation:

- | | | | | |
|-------------------------------|----------|--------|--|--|
| 1. Original Wt. | 7.60 gm. | 100.0% | | |
| 2. Cylinder (+1/32) | 4.98 gm. | 65.5 % | | |
| 3. Jar (1/32-1/64) | .73 gm. | 9.6 % | | |
| 4. Drain | 1.89 gm. | 24.9 % | | |

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	3.70	77.4
1/4-1/8 mm	1.08	25.6
1/8-1/16		
Pan		
Total	4.78	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. }
 Bromoform } 93+ Sp. gr. Size-Grade(s) 1/4 Pan mm.

Analyst KUNDERT
 Date MAY 28 1935

Wt. of sample 1.11 gm. 100.0% Shape Analysis:

Heavy Minerals02 gm. 1.8 % A. %: a %: C %

Light Minerals 1.09 gm. 98.2 % r %: R %.

Minerals Identified: No. of Grains Rel. % Classification Grouping: Absol. %

Heavy Concentrate Primary Minerals: 96.1 %

Purite	222	86.3	Allanite	
Sphalerite	1	0.4	Hornblende	
Hornblende	1	0.4	Feldspar	0.3
* Allanite(?)	2	0.8	Clay Minerals	88.7
Limonic Aggregates	31	12.1	Quartz	7.1
Total	257	100%		

Light Concentrate			Secondary Minerals: <u>3.9</u> %	
Chert	28	2.1	Purite	1.6
Clay Minerals	1250	90.4	Sphalerite	
Feldspars	4	0.3	Chert	2.1
Quartz	100	7.2	Limonic Aggregates	0.2
Total	1382	100%	Total	100%

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

limestone - 10-80% buff, finely crystalline, dense;
shale 20-30% green, calcareous; 15-20%
soluble, blocky.

* (over)

* - Allanite (?) - Mineral colorless, non-pleochroic,
refractive 1.72-1.75 ±; birefringence 0.030 ±;
optic Δ 60-70°, negative; many inclusions.

DEEP WELL STUDY

MECHANICAL ANALYSIS

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

- | | | | |
|--|-----------|--------|-----------------------------|
| 1. Sample weight | 20.77 gm. | 100.0% | 2. Wt. of F. P. <u>2.32</u> |
| 3. Wt. after solution, with filter paper | 12.04 gm. | | |
| 4. Less wt. F. P. (2) | 2.32 gm. | | |
| 5. Wt. Insol. Residue (3 minus 4) | 9.72 gm. | 46.8% | |
| 6. Wt. lost by solution (1 minus 5) | 11.05 gm. | 53.2% | |
| 7. To balance (5 plus 6) | 20.77 gm. | 100.0% | |

B. Subsidiation:

- | | | | |
|-------------------------------|----------|--------|--|
| 1. Original Wt. | 9.72 gm. | 100.0% | |
| 2. Cylinder (+1/32) | 6.94 gm. | 66.2% | |
| 3. Jar (1/32—1/64) | 1.15 gm. | 11.9% | |
| 4. Drain | 2.13 gm. | 21.9% | |

Well No. W- 0117
 Depth 53.9 to 54.4
 No. samples used 3
 Analyst Scott
 Date 3/1/35

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	2.42	38.4
1/4-1/8 mm	3.89	61.6
1/8-1/16		
Pan		
Total	6.29	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. }
 Bromoform } 2.94 Sp. gr. Size-Grade(s) 1/4 Pan mm.

Analyst KUNDERT
 Date MAY 29, 1935

Wt. of sample 3.90 gm. 100.0% Shape Analysis:

Heavy Minerals01 gm. .3 % A. %: a %: C %

Light Minerals 3.89 gm. 99.7 % r %: R %

Minerals Identified:
 Heavy Concentrate

No. of Grains

Rel. %

Classification Grouping:

Absol. %

Pyrite
Leucoxene
Hornblende
Epidote
Diopside
Limonite Aggregates

175	78.7
18	4.8
2	0.5
4	1.1
10	2.6
69	18.3

Primary Minerals: 96.1 %

Diopside
Hornblende
Epidote
Clay Minerals
Quartz

92
4

Total 3.78 100%

Light Concentrate

Clay Minerals
Chert
Quartz

929	72.3
30	8.0
47	4.7

Secondary Minerals: 3.3 %

Pyrite
Leucoxene
Limonite Aggregates
Chert

0.2
0.1
3.0

Total 10.06 100% Total 100%

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

shale: 85%+ light gray, calcareous, 25-30% soluble, friable;
limestone 15%+ buff to light gray, finely crystalline, dense

DEEP WELL STUDY

MECHANICAL ANALYSIS

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

- | | | | |
|--|-----------|--------|-----------------------------|
| 1. Sample weight | 20.89 gm. | 100.0% | 2. Wt. of F. P. <u>2.37</u> |
| 3. Wt. after solution, with filter paper | 18.27 gm. | | |
| 4. Less wt. F. P. (2) | 2.37 gm. | | |
| 5. Wt. Insol. Residue (3 minus 4) | 15.90 gm. | 76.1% | |
| 6. Wt. lost by solution (1 minus 5) | 4.99 gm. | 23.9% | |
| 7. To balance (5 plus 6) | 20.89 gm. | 100.0% | |

B. Subsidation:

- | | | | |
|--|-----------|--------|--|
| 1. Original Wt. | 15.90 gm. | 100.0% | |
| 2. Cylinder (+1/32) <u>12.55</u>
2.36 | 10.19 gm. | 64.1% | |
| 3. Jar (1/32—1/64) <u>4.29</u>
4.29 | 1.92 gm. | 12.1% | |
| 4. Drain | 3.79 gm. | 33.8% | |

Well No. W—

Depth 544 to 546

No. samples used.....

Analyst S. H. H.

Date 3/11/35

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	5.29	52.8
1/4-1/8 mm	4.70	47.2
1/8-1/16		
Pan		
Total	9.97	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } 2.937 Sp. gr. Size-Grade(s) 1/4 Pan mm.

Analyst KUNDERT
Date MAY 29, 1935

Wt. of sample 3.51 gm. 100.0% Shape Analysis:

Heavy Minerals 1.01 gm. 2.9% A.....%: a.....%: C.....%

Light Minerals 3.50 gm. 99.7% r.....%: R.....%

Minerals Identified: Heavy Concentrate No. of Grains Rel. % Classification Grouping: Primary Minerals: 98.3% Absol. %

Minerals Identified:	No. of Grains	Rel. %	Classification Grouping:	Absol. %
<u>Pyrite</u>	380	85.7	<u>Augite</u>	
<u>Zircon-Unzoned</u>	1	0.2	<u>Zircon-Unzoned</u>	
<u>Leucoxene</u>	10	2.2	<u>Clay Minerals</u>	92.5
<u>Augite</u>	3	0.7	<u>Quartz</u>	5.7
<u>Limonite Aggregates</u>	60	13.2		

Total 4.54 100%

Light Concentrate	No. of Grains	Rel. %	Secondary Minerals:	Absol. %
<u>Chert</u>	20	1.5	<u>Pyrite</u>	0.3
<u>Clay Minerals</u>	1224	92.8	<u>Leucoxene</u>	
<u>Quartz</u>	75	5.7	<u>Limonite Aggregates</u>	
			<u>Chert</u>	1.5

Total 1319 100% Total 100%

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

Shale: 95-100% black, carboniferous, calcareous, 25-30% soluble friable; limestone 1-5% buff, finely crystalline, dense.

DEEP WELL STUDY

MECHANICAL ANALYSIS

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

- | | | | | |
|--|-----------|--------|-----------------|------|
| 1. Sample weight | 20.11 gm. | 100.0% | 2. Wt. of F. P. | 2.38 |
| 3. Wt. after solution, with filter paper | 17.61 gm. | | | |
| 4. Less wt. F. P. (2) | 2.38 gm. | | | |
| 5. Wt. Insol. Residue (3 minus 4) | 15.23 gm. | 75.9% | | |
| 6. Wt. lost by solution (1 minus 5) | 4.88 gm. | 24.2% | | |
| 7. To balance (5 plus 6) | 20.11 gm. | 100.0% | | |

B. Subsidiation:

- | | | |
|---------------------|-----------|--------|
| 1. Original Wt. | 15.23 gm. | 100.0% |
| 2. Cylinder (+1/32) | 5.83 gm. | 38.3% |
| 3. Jar (1/32-1/64) | 3.16 gm. | 20.8% |
| 4. Drain | 6.24 gm. | 40.9% |

Well No. W- 0117

Depth 546 to 556

No. samples used 4

Analyst Scott

Date 3/1/35

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	1.69	11.5
1/4-1/8 mm	14.04	70.5
1/8-1/16		
Pan		
Total	5.72	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform- } 2.93 Sp. gr. Size-Grade(s) 1/4 Pan mm.

Analyst KUNDERT

Date MAY 29, 1935

Wt. of sample 3.57 gm. 100.0% Shape Analysis:

Heavy Minerals .01 gm. 3% A.....%: a.....%: C.....%

Light Minerals 3.56 gm. 99.7% r.....%: R.....%

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

Pyrite
Leucoxene
Hornblende
Limonite Aggregates

229	77.4
10	3.4
1	0.3
56	18.9

Hornblende
Quartz 3.9
Clay Minerals 95.8

Total 2.96 100%

Light Concentrate

Clay Minerals
Quartz

950	96.1
38	3.9

Secondary Minerals: 0.3%
Pyrite 0.2
Limonite Aggregates 0.1
Leucoxene

Total 988 100% Total 100%

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

shale: 90-100% gray calcareous, 20% soluble, blocky; limestone 1-10% buff, finely crystalline, dense.

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl) 15 %

- | | | | | |
|--|------------------|----------------|-----------------|-------------|
| 1. Sample weight | <u>30.14</u> gm. | 100.0% | 2. Wt. of F. P. | <u>2.15</u> |
| 3. Wt. after solution, with filter paper | <u>8.90</u> gm. | | | |
| 4. Less wt. F. P. (2) | <u>2.15</u> gm. | | | |
| 5. Wt. Insol. Residue (3 minus 4) | <u>6.95</u> gm. | <u>22.4</u> % | | |
| 6. Wt. lost by solution (1 minus 5) | <u>23.39</u> gm. | <u>77.6</u> % | | |
| 7. To balance (5 plus 6) | <u>30.14</u> gm. | <u>100.0</u> % | | |

B. Subsidiation:

- | | | |
|---------------------|-----------------|---------------|
| 1. Original Wt. | <u>6.75</u> gm. | 100.0% |
| 2. Cylinder (+1/32) | <u>4.50</u> gm. | <u>66.7</u> % |
| 3. Jar (1/32-1/64) | <u>.70</u> gm. | <u>10.4</u> % |
| 4. Drain | <u>1.55</u> gm. | <u>22.9</u> % |

Well No. W- 0117

Depth 556 to 567

No. samples used 2

Analyst Scott

Date 3/11/35

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	<u>3.12</u>	<u>71.1</u>
1/4-1/8 mm	<u>1.27</u>	<u>28.9</u>
1/8-1/16		
Pan		
Total	<u>4.39</u>	<u>100.0</u>

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } 2922 Sp. gr. Size-Grade(s) 4 Pan mm.

Analyst Filasota
Date May 31-35

Wt. of sample 1.25 gm. 100.0%
Heavy Minerals .02 gm. .16 %
Light Minerals 1.23 gm. 98.1 %

Shape Analysis:

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

Minerals Identified:
Heavy Concentrate

No. of Grains	Rel. %
<u>1</u>	<u>2.5</u>
<u>3</u>	<u>0.8</u>
<u>310</u>	<u>86.1</u>
<u>38</u>	<u>10.6</u>

Classification Grouping:
Primary Minerals: 91.9 %

Absol. %

Hornblende
Barite
Pyrite
limonite Agg.

<u>Hornblende</u>	<u>87.6</u>
<u>Clay Minerals</u>	<u>4.3</u>
<u>quartz</u>	

Total 360 100%

Light Concentrate

<u>Clay Minerals</u>	<u>810</u>	<u>89.0</u>
<u>quartz</u>	<u>40</u>	<u>4.4</u>
<u>chert</u>	<u>60</u>	<u>6.6</u>

Secondary Minerals: 8.1 %

<u>Barite</u>	
<u>limonite Agg.</u>	<u>0.2</u>
<u>chert</u>	<u>6.5</u>
<u>pyrite</u>	<u>1.4</u>

Total 910 100%

Total 100%

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

Limestone - 90-95% cream fine line dense; Shales 10%
gr. greenish, Calc, 30-40% Sol. Pyrite 1%±

DEEP WELL STUDY

MECHANICAL ANALYSIS

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

1. Sample weight	20.29 gm.	100.0%	2. Wt. of F. P. <u>2.16</u>
3. Wt. after solution, with filter paper	13.30 gm.		
4. Less wt. F. P. (2)	2.16 gm.		
5. Wt. Insol. Residue (3 minus 4)	11.14 gm.	55.0 %	
6. Wt. lost by solution (1 minus 5)	9.15 gm.	45.0 %	
7. To balance (5 plus 6)	20.29 gm.	100.0 %	

B. Subsidiation:

1. Original Wt.	19 gm.	100.0%
2. Cylinder (+1/32) <u>2.68</u>	6.99 gm.	58.2 %
3. Jar (1/32-1/64) <u>2.19</u>	1.64 gm.	14.7 %
4. Drain <u>4.01</u>	3.01 gm.	27.1 %

Well No. W- 6117
 Depth 56.7 to 57.2
 No. samples used 2
 Analyst Scott
 Date 3/1/55

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	2.21	50.9
1/4-1/8 mm	3.10	49.1
1/8-1/16		
Pan		
Total	6.31	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } 93± Sp. gr. Size-Grade(s) 1/4 Pan mm.

Analyst Filasota
 Date May 31-1955

Wt. of sample 3.12 gm. 100.0%

Heavy Minerals 1.02 gm. 0.6 %

Light Minerals 3.10 gm. 99.4 %

Shape Analysis:

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

Minerals Identified: Heavy Concentrate

No. of Grains	Rel. %
2	0.2
1	0.1
3	0.4
1	0.1
15	1.9
700	87.2
1	0.1
80	10.0
Total	803

Classification Grouping:

Primary Minerals: 92.2 % 87.9 %

- Hornblende
- garnet
- Tourmaline
- Zircon
- Barite
- Pyrite
- * Moissanite
- limonite Agg.

- zircon
- Clay Minerals
- Tourmaline
- Hornblende
- Feldspar
- quartz

Light Concentrate

No. of Grains	Rel. %
40	4.2
1	0.1
850	38.4
70	7.3
Total	961

Secondary Minerals: 7.8 %

- Barite
- Pyrite
- lim. Agg.
- chert

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

Shale 85-95% dk green to bl. calc 30-40% Blacky; L.S. 10-20% bf. Fine x line dense.

Moissanite - Blue green, high ref, Pleochroic, Poor cleavage
Evidently from a bottle stopper

DEEP WELL STUDY

MECHANICAL ANALYSIS

- A. Acid treatment (HCl...1.5...%)
1. Sample weight 19.55 gm. 100.0%: F. P. 2.33
 2. Wt. of
 3. Wt. after solution, with filter paper 7.19 gm.
 4. Less wt. F. P. (2) 2.33 gm.
 5. Wt. Insol. Residue (3 minus 4) 4.86 gm. 24.9%
 6. Wt. lost by solution (1 minus 5) 14.69 gm. 75.1%
 7. To balance (5 plus 6) 19.55 gm. 100.0%

- B. Subsidation:
1. Original Wt. 4.56 gm. 100.0%
 2. Cylinder (+1/32) 6.20
2.23 9.97 gm. 81.7%
 3. Jar (1/32—1/64) 2.57
1.30 gm. 6.2%
 4. Drain 1.59 gm. 1.2%

Well No. W— 0117
 Depth 572 to 676
 No. samples used 1
 Analyst Scott
 Date July 1935

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1 1/4 mm	1.78	46.7
1/4-1/8 mm	12.03	53.3
1/8-1/16		
Pan		
Total	3.21	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. }
 Bromoform } 931 Sp. gr. Size-Grade(s) 1/40 mm mm.

Analyst Filasata
 Date June 3-35

Wt. of sample 2.00 gm. 100.0% Shape Analysis:
 Heavy Minerals 0.1 gm. 0.5% A. %: a %: C %
 Light Minerals 1.9 gm. 99.5% r %: R %.

Minerals Identified; Heavy Concentrate No. of Grains Rel. % Classification Grouping: Absol. %
 Primary Minerals: 3%

Leucosene	2	0.6
Barite	13	4.1
Amphibole	11	3.5
garnet	1	0.3
Zircon	1	0.3
Andalusite	1	0.3
Epidote	1	0.3
lime Agg.	85	27.7
Pyrite	200	63.6
Total	315	100%

Amphibole
 garnet
 zircon
 Andalusite

Light Concentrate
 Quartz
 Clay Minerals 76
 Chert 15
 Total 390 100% Total 15.7 100%
 Secondary Minerals: 15.7%
 Barite
 Pyrite
 lime Agg.
 chert
 Leucosene

Revised Lithologic Description (from descriptive log and laboratory data).
hole 60-70% black shale 30-40% Sol. friable
ne. m. den

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15%)

- | | | | |
|--|------------------|----------------|---------------------------|
| 1. Sample weight | <u>20.73</u> gm. | 100.0% | 2. Wt. of F. P. <u>31</u> |
| 3. Wt. after solution, with filter paper | <u>7.50</u> gm. | | |
| 4. Less wt. F. P. (2) | <u>2.31</u> gm. | | |
| 5. Wt. Insol. Residue (3 minus 4) | <u>5.19</u> gm. | <u>25.0</u> % | |
| 6. Wt. lost by solution (1 minus 5) | <u>15.54</u> gm. | <u>75.0</u> % | |
| 7. To balance (5 plus 6) | <u>20.73</u> gm. | <u>100.0</u> % | |

Well No. W- 0117
 Depth 576 to 579 1/2
 No. samples used 1
 Analyst Scott
 Date 3/11/35

B. Subsidiation:

- | | | |
|--|-----------------|----------------|
| 1. Original Wt. | <u>5.19</u> gm. | 100.0% |
| 2. Cylinder (+1/32) <u>6.05</u>
<u>2.32</u> | <u>3.73</u> gm. | <u>71.9</u> % |
| 3. Jar (1/32-1/64) <u>2.84</u>
<u>2.32</u> | <u>5.2</u> gm. | <u>100.0</u> % |
| 4. Drain | <u>.94</u> gm. | <u>18.1</u> % |

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1-1/4 mm	<u>1.70</u>	<u>47.2</u>
1/4-1/8 mm	<u>1.90</u>	<u>52.8</u>
1/8-1/16		
Pan		
Total	<u>3.60</u>	<u>100.0</u>

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } 2.93 Sp. gr. Size-Grade(s) 1/4 Pan mm.

Wt. of sample 1.87 gm. 100.0% Shape Analysis:

Heavy Minerals .01 gm. 0.535 % A. %: a %: C %

Light Minerals 1.86 gm. 99.5 % r %: R %

Minerals Identified: Heavy Concentrate No. of Grains Rel. % Classification Grouping: Primary Minerals: 99.6 % Absol. %

Pyrite Zircon-Unzoned Garnet Hornblende Staurolite Barite Cyanite Limonite Aggregates	<table border="1" style="margin: auto;"> <tr><td>210</td><td>80.4</td></tr> <tr><td>4</td><td>0.4</td></tr> <tr><td>4</td><td>1.5</td></tr> <tr><td>4</td><td>1.5</td></tr> <tr><td>2</td><td>0.8</td></tr> <tr><td>1</td><td>0.4</td></tr> <tr><td>38</td><td>14.6</td></tr> <tr><td colspan="2">Total 261 100%</td></tr> </table>	210	80.4	4	0.4	4	1.5	4	1.5	2	0.8	1	0.4	38	14.6	Total 261 100%		Garnet Staurolite Hornblende Cyanite Barite Zircon-Unzoned Feldspar Quartz Clay Minerals
210	80.4																	
4	0.4																	
4	1.5																	
4	1.5																	
2	0.8																	
1	0.4																	
38	14.6																	
Total 261 100%																		
		0.1 1.0 98.5																

Light Concentrate Clay Minerals Feldspar Quartz	<table border="1" style="margin: auto;"> <tr><td>954</td><td>98.9</td></tr> <tr><td>10</td><td>0.1</td></tr> <tr><td>10</td><td>1.0</td></tr> <tr><td colspan="2">Total 965 100%</td></tr> </table>	954	98.9	10	0.1	10	1.0	Total 965 100%		Secondary Minerals: <u>0.4</u> % Pyrite Limonite Aggregates
954	98.9									
10	0.1									
10	1.0									
Total 965 100%										

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

Limestone: 50-60% ; medium to dark gray, friable, clay content 30-40% ; pyrite cumulon

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl.....15.%)

1. Sample weight	19.40 gm.	100.0%	2. Wt. of F. P. <u>2.19</u>
3. Wt. after solution, with filter paper	11.96 gm.		
4. Less wt. F. P. (2)	2.19 gm.		
5. Wt. Insol. Residue (3 minus 4)	9.77 gm.	50.4%	
6. Wt. lost by solution (1 minus 5)	9.63 gm.	49.6%	
7. To balance (5 plus 6)	19.40 gm.	100.0%	

B. Subsidiation:

1. Original Wt.	9.77 gm.	100.0%
2. Cylinder (+1/32) <u>6.04</u>	3.69 gm.	37.7%
<u>2.35</u>		
<u>3.99</u>		
3. Jar (1/32—1/64) <u>1.68</u>	1.68 gm.	17.2%
4. Drain <u>4.70</u>	4.70 gm.	45.1%

Well No. W— 0117

Depth 579 1/2 to 580

No. samples used 1

Analyst Scott

Date 3/11/35

C. Screen Analysis 3.09

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2 -1/4 mm	2.42	67.8
1/4-1/8 mm	1.15	32.2
1/8-1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } 93.5 Sp. gr. Size-Grade(s) 1/4 Pan mm.

Analyst KUNDEBT

Date JUN. 3, 1935

Wt. of sample 1.13 gm. 100.0% Shape Analysis:

Heavy Minerals 0.1 gm. 0.9 % A.....%: a.....%: C.....%

Light Minerals 1.12 gm. 99.1 % r.....%: R.....%

Minerals Identified: Heavy Concentrate No. of Grains Rel. % Classification Grouping: Primary Minerals: 99.1% Absol. %

Barite	3	1.2	Andalusite	
Pyrite	100	64.0	Barite	
Andalusite	5	2.0	Hornblende	
Hornblende	1	0.4	Clay Minerals	95.9
Limonite Aggregate	60	24.0	Quartz	2.9
Scale	21	8.4	Feldspar	0.3

Total 2.50 100%

Light Concentrate		Secondary Minerals: <u>0.9</u> %		
Clay Minerals	845	96.8	Pyrite	0.6
Feldspar	3	0.2	Limonite Aggregate	0.2
Quartz	25	2.9	Scale	0.1

Total 8.73 100% Total 100%

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

shale: 9:100% very calcareous, 40% at soluble, some pyrite; limestone 5-10%, very fossiliferous

DEEP WELL STUDY

MECHANICAL ANALYSIS

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

1. Sample weight	29.66 gm.	100.0%	2. Wt. of F. P.	2.36
3. Wt. after solution, with filter paper	9.61 gm.			
4. Less wt. F. P. (2)	2.36 gm.			
5. Wt. Insol. Residue (3 minus 4)	7.25 gm.	24.4%		
6. Wt. lost by solution (1 minus 5)	22.41 gm.	75.6%		
7. To balance (5 plus 6)	29.66 gm.	100.0%		

Well No. W- 0117
 Depth 580 to 582
 No. samples used 1
 Analyst Scott
 Date 3/11/65

B. Subsidiation:

1. Original Wt.	7.25 gm.	100.0%
2. Cylinder (+1/32)	5.86 gm.	80.9%
3. Jar (1/32-1/64)	.51 gm.	7.0%
4. Drain	.88 gm.	12.1%

C. Screen Analysis 75

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	2.89	50.7
1/4-1/8 mm	2.81	49.3
1/8-1/16		
Pan		
Total	5.70	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. }
 Bromoform. } 92± Sp. gr. Size-Grade(s) 1/4 Pan mm.

Analyst Filaseta
 Date Jan 35

Wt. of sample 2.82 gm. 100.0% Shape Analysis:

Heavy Minerals 0.4 gm. % A.....%: a.....%: C.....%

Light Minerals 99.6 gm. % r.....%: R.....%

Minerals Identified; Heavy Concentrate No. of Grains Rel. % Classification Grouping: Primary Minerals: 77.2% Absol. %

Mineral	No. of Grains	Rel. %
Garnet	10	4.2
Staurolite	3	1.2
Kornblende	12	5.0
Kyanite	1	0.4
Andalusite	1	0.4
Barite	5	2.1
Epidote	2	0.8
Plyite	50	62.5
lim. Agg	56	23.3
Total		100%

Mineral	Rel. %	Absol. %
Garnet		
Staurolite		
Kornblende		
Kyanite		
Plyite		62.6
lim. Agg		14.6

Light Concentrate

Mineral	No. of Grains	Rel. %
quartz	5	14.6
clay Minerals	236	62.8
	25	22.6
Total		100%

Secondary Minerals: 22.8%

Mineral	Rel. %	Absol. %
Plyite		0.2
lim. Agg		0.1

Total 37 100% Total

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

LS. 40-70% impure; lgt + dk grs; friable; ex-
shy. clay content 30-40%; sand 10

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15%)

- | | | | | |
|--|-----------|--------|-----------------|------|
| 1. Sample weight | 20.83 gm. | 100.0% | 2. Wt. of F. P. | 2.39 |
| 3. Wt. after solution, with filter paper | 13.41 gm. | | | |
| 4. Less wt. F. P. (2) | 2.39 gm. | | | |
| 5. Wt. Insol. Residue (3 minus 4) | 11.02 gm. | 52.9% | | |
| 6. Wt. lost by solution (1 minus 5) | 9.81 gm. | 47.1% | | |
| 7. To balance (5 plus 6) | 20.83 gm. | 100.0% | | |

Well No. W-0117

Depth 582 to 600

No. samples used 1

Analyst Scott

Date 3/11/35

B. Subsidation:

- | | | |
|---------------------|-----------|--------|
| 1. Original Wt. | 11.02 gm. | 100.0% |
| 2. Cylinder (+1/32) | 6.00 gm. | 54.4% |
| 3. Jar (1/32-1/64) | 1.93 gm. | 17.5% |
| 4. Drain | 3.09 gm. | 28.1% |

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	2.80	47.4
1/4-1/8 mm	3.12	52.6
1/8-1/16		
Pan		
Total	5.92	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } 2.935 Sp. gr. Size-Grade(s) 1/4 Pan mm.

Analyst Filaseta

Date June 11-35

Wt. of sample 2.96 gm. 100.0%

Shape Analysis:

Heavy Minerals 0.02 gm. 0.7 %

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

Light Minerals 2.94 gm. 99.3 %

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

Minerals Identified; Heavy Concentrate

No. of Grains Rel. %

Classification Grouping:

Absol. %

Primary Minerals: 99.3 %

Epidote	2	0.3
Barite	2	0.3
Hornblende	2	0.3
Garnet	1	0.1
Enstatite	1	0.1
Zircon	1	0.1
Amphibole	1	0.1
Andalusite	1	0.1
Pyrite	650	81.4
Limonite Agg.	80	10.8
Leucosane	3	0.4
Total	744	100%

Epidote		
Hornblende		
Garnet		
Enstatite		
Zircon		
Amphibole		
Andalusite		
Leucosane		
Feldspars		
Clay Minerals		0.4
quartz		86.2
		7.5

Light Concentrate

Secondary Minerals: 5.8 %

Feldspars	5	0.1
Chert	90	5.1
quartz	108	7.6
Clay Minerals	1200	86.9

Barite		
Pyrite		0.6
limonite Agg.		0.1
chert		5.1

Total 1380 100%

Total 100%

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

Shale 80-90% drk gray to nearly blk Calc, 20-30% Sol; Snd.
5-10% fine chiefly etc; ls. 15-25% soft shly Pyrite
present

DEEP WELL STUDY

MECHANICAL ANALYSIS

- A. Acid treatment (HCl 15%)
1. Sample weight 30.69 gm. 100.0% : F. P. 2.16
 2. Wt. of
 3. Wt. after solution, with filter paper 6.91 gm.
 4. Less wt. F. P. (2) 2.16 gm.
 5. Wt. Insol. Residue (3 minus 4) 4.75 gm. 15.5%
 6. Wt. lost by solution (1 minus 5) 25.94 gm. 84.5%
 7. To balance (5 plus 6) 30.69 gm. 100.0%

Well No. W— 0117
 Depth 600 to 605
 No. samples used
 Analyst Scott
 Date 3/11/35

- B. Subsidiation:
1. Original Wt. 4.75 gm. 100.0%
 2. Cylinder (+1/32) 6.45 4.15 gm. 87.4%
 3. Jar (1/32—1/64) 2.30 2.36 1.6 gm. 3.4%
 4. Drain 2.20 451 .74 gm. 9.2%

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	<u>2.72</u>	<u>66.4</u>
1/4-1/8 mm	<u>1.38</u>	<u>33.6</u>
1/8-1/16		
Pan		
Total	<u>4.10</u>	<u>100.0</u>

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. }
 Bromoform } Sp. gr. Grade(s) 1/4 Pan mm.

Analyst KUNDERT
 Date JUN 3, 1935

Wt. of sample 1.30 gm. 100.0% Shape Analysis:

Heavy Minerals01 gm. 0.8 % A % : a % : C %

Light Minerals 1.29 gm. 99.2 % r % : R %

Minerals Identified: No. of Grains Rel. % Classification Grouping: Absol. %

Heavy Concentrate Primary Minerals: 99.2%

Barite
Pyrite
Zircon-Unzoned
Homblende
Limouite Appagates
Scale

3	.3
780	89.1
3	.3
3	.3
81	9.3
6	.7

Homblende
Barite
Zircon-Unzoned
Clay Minerals
Quartz

.1
 .0
 .0
99.7
1.5

Total 876 100%

Light Concentrate
Clay Minerals
Quartz

920	98.5
14	1.5

Secondary Minerals: 1.8%
Pyrite
Limouite Appagates
Scale

.7
 .1
 .

Total 934 100% Total 100%

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

Limestone: 70-80%; light gray to buff, cherty, easily broken, shaly, a few fragments of dark gray limestone

DEEP WELL STUDY

MECHANICAL ANALYSIS

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

1. Sample weight	30.62 gm.	100.0%	2. Wt. of F. P.	2.17
3. Wt. after solution, with filter paper	10.18 gm.			
4. Less wt. F. P. (2)	2.17 gm.			
5. Wt. Insol. Residue (3 minus 4)	8.01 gm.	26.2%		
6. Wt. lost by solution (1 minus 5)	22.61 gm.	73.8%		
7. To balance (5 plus 6)	0.62 gm.	100.0%		

Well No. W- 0117
 Depth 610 to 614
 No. samples used
 Analyst Scott
 Date 3/11/35

B. Subsidiation:

1. Original Wt.	8.01 gm.	100.0%
2. Cylinder (+1/32)	7.04 gm.	87.9%
3. Jar (1/32-1/64)	.37 gm.	4.6%
4. Drain	.60 gm.	7.5%

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	4.42	64.2
1/4-1/8 mm	2.41	35.8
1/8-1/16		
Pan		
Total	6.89	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } Sp. gr. Size-Grade(s) 1/4 Pan mm.

Wt. of sample 2.31 gm. 100.0% Shape Analysis:

Heavy Minerals .02 gm. 0.8% A.....%: a.....%: C.....%

Light Minerals 2.31 gm. 9.2% r.....%: R.....%

Minerals Identified: Heavy Concentrate No. of Grains Rel. % Classification Grouping: Primary Minerals: 99.2% Absol. %

Mineral	No. of Grains	Rel. %	Classification	Absol. %
Barite	3	1.1	Augite	.0
Pyrite	223	80.7	Hornblende	.0
Garnet	1	.4	Garnet	.0
Leucopene	11	4.0	Quartz	1.1
Hornblende	3	1.1	Clay Minerals	99.7
Augite	1	.4	Feldspar	.4
Limonite Aggregates	34	12.3		

Total 276 100%

Mineral	No. of Grains	Rel. %	Classification	Absol. %
Clay Minerals	940	98.5	Secondary Minerals: Pyrite	.7
Feldspar	4	.4	Limonite Aggregates	.1
Quartz	10	1.1	Leucopene	

Total 954 100% Total 100%

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

Limestone: 60-100% - lat. gray to cream, cherty;
 ls dark grey 200%: sand 10-200% - 1/4-1/8 -
 A to a, clear, not frosted -

DEEP WELL STUDY

MECHANICAL ANALYSIS

- A. Acid treatment (HCl.....%)
1. Sample weight 30.89 gm. 100.0%: F. P. 3
 2. Wt. of
 3. Wt. after solution, with filter paper 8.14 gm.
 4. Less wt. F. P. (2) 2.35 gm.
 5. Wt. Insol. Residue (3 minus 4) gm. 8 %
 6. Wt. lost by solution (1 minus 5) 20.04 gm. 81.3 %
 7. To balance (5 plus 6) 30.83 gm. 100.0 %
- B. Subsidiation:
1. Original Wt. gm. 100.0%
 2. Cylinder (+1/32) 2.05 gm. 7 %
 3. Jar (1/32—1/64) 2.31 gm. 36 %
 4. Drain 2.52 gm. 2.21 %

Well No. W— 2117
 Depth 214 to 621
 No. samples used 2
 Analyst Scott
 Date 3/11/35

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	<u>2.83</u>	<u>60</u>
1/4-1/8 mm	<u>1.69</u>	
1/8-1/16		
Pan		
Total	<u>4.74</u>	<u>100.0</u>

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. }
 Bromoform } Sp. gr. Size-Grade(s) 1/4 Bar mm.

Wt. of sample 83 gm. 100.0% Shape Analysis:

Heavy Minerals gm. 1.6 % A. %: a %: C %

Light Minerals gm. 80 98 % r %: R %

Analyst F. J. Scola
 Date June 4, 1935

Minerals Identified;	No. of Grains	Rel. %	Classification Grouping:	Absol. %
Heavy Concentrate			Primary Minerals: <u>82.7</u> %	
phibolo	15	3.8	Amphibole	.1
lanita	17	4.3	Kyanite	.0
zinnit	2	.5	garnet	.0
pidot	5	1.3	zpidot	.0
adapina	4	1.0	Andalusite	.0
adapina	2	.5	quartz	10.3
adapina	268	68.3	kaocorpha	.0
adapina	2	.5	Clay Min.	73.0
adapina	78	19.8	Feldspar	.3
Total	<u>393</u>	<u>100</u> %	Secondary Minerals: <u>1.6.3</u> %	
Light Concentrate			Barit	.1
quartz	70	10.5	Pyrit	1.1
claymin	445	74.2	chert	1.8
Feldspar	2	.3		.3
chert	109	15.0		
Total	<u>667</u>	<u>100</u> %	Total	<u>100</u> %

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

20% gray to cream sh + mottled, = 20%
qtz 57% dr. blue + dant

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl 1.5%)

- | | | | |
|--|------------------|---------------|-----------------------------|
| 1. Sample weight | <u>19.72</u> gm. | 100.0% | 2. Wt. of F. P. <u>2.35</u> |
| 3. Wt. after solution, with filter paper | <u>19.41</u> gm. | | |
| 4. Less wt. F. P. (2) | <u>2.35</u> gm. | | |
| 5. Wt. Insol. Residue (3 minus 4) | <u>12.06</u> gm. | <u>61.2</u> % | |
| 6. Wt. lost by solution (1 minus 5) | <u>7.66</u> gm. | <u>38.8</u> % | |
| 7. To balance (5 plus 6) | <u>19.72</u> gm. | | |

B. Subsidiation:

- | | | | |
|----------------------------------|------------------|---------------|--|
| 1. Original Wt. | <u>12.06</u> gm. | 100.0% | |
| 2. Cylinder (+1/32) <u>10.91</u> | <u>8.04</u> gm. | <u>66.6</u> % | |
| 3. Jar (1/32—1/64) <u>1.00</u> | <u>1.66</u> gm. | <u>13.8</u> % | |
| 4. Drain <u>2.39</u> | <u>2.36</u> gm. | <u>19.6</u> % | |

Well No. W— 0117
 Depth 621 to 631 1/2
 No. samples used 1
 Analyst Scott
 Date 3/6/35

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1-1/4 mm	<u>3.06</u>	<u>38.4</u>
1/4-1/8 mm	<u>4.90</u>	<u>61.6</u>
1/8-1/16		
Pan		
Total	<u>7.96</u>	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. }
 Bromoform } 5.99 Sp. gr. Size-Grade(s) 1/4 Pan mm.

Analyst Filasot
 Date June 2, 1935

Wt. of sample 3.79 gm. 100.0% Shape Analysis:

Heavy Minerals .02 gm. 0.50% A.....%: a.....%: C.....%

Light Minerals 3.77 gm. 99.5% r.....%: R.....%

Minerals Identified: Heavy Concentrate No. of Grains Rel. % Classification Grouping: Primary Minerals: 88.1% Absol. %

	c =
208	87.4
27	17.3
2	0.8
1	0.4

9.2
73.9

Total 100%

Light Concentrate 74.3
1/4 56 9.2
var. 100 16.5
ort

Secondary Minerals: 16.9%
quartz
quartz 0.4
im. aggr 0.1
chert 16.4

Total 0.6 100% Total 100%

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

Shale 90-95% dk grey to black, calc. h.s. 5-10% sft, shly,
Pyrite abundant, Marine fossils.

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15%)

- | | | | |
|--|------------------|----------------|-----------------------------|
| 1. Sample weight | <u>29.82</u> gm. | 100.0% | 2. Wt. of F. P. <u>2.37</u> |
| 3. Wt. after solution, with filter paper | <u>6.37</u> gm. | | |
| 4. Less wt. F. P. (2) | <u>2.37</u> gm. | | |
| 5. Wt. Insol. Residue (3 minus 4) | <u>4.00</u> gm. | <u>13.4</u> % | |
| 6. Wt. lost by solution (1 minus 5) | <u>25.82</u> gm. | <u>86.6</u> % | |
| 7. To balance (5 plus 6) | <u>29.82</u> gm. | <u>100.0</u> % | |

B. Subsidiation:

- | | | | |
|---------------------------------|-----------------|----------------|--|
| 1. Original Wt. | <u>4.00</u> gm. | 100.0% | |
| 2. Cylinder (+1/32) <u>2.29</u> | <u>3.42</u> gm. | <u>85.5</u> % | |
| 3. Jar (1/32—1/64) <u>2.22</u> | <u>.17</u> gm. | <u>4.25</u> % | |
| 4. Drain | <u>.41</u> gm. | <u>10.25</u> % | |

Well No. W— 0.117
 Depth 31 1/2 to 6.36
 No. samples used
 Analyst Scott
 Date 3/11/35

C. Screen Analysis 3.28

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	<u>2.91</u>	<u>73.5</u>
1/4-1/8 mm	<u>.87</u>	<u>26.5</u>
1/8-1/16		
Pan		
Total	<u>3.28</u>	<u>100.0</u>

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } 33± Sp. gr. Size-Grade(s) 1/4 Pan mm.

Analyst KUNDEBT
 Date JUN. 6, 1935

Wt. of sample81 gm. 100.0% Shape Analysis:

Heavy Minerals01 gm. 1.2% A.%: a%: C%
 Light Minerals80 gm. 98.8% r%: R%

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

Minerals Identified:	No. of Grains	Rel. %	Classification Grouping:	Absol. %
Barite	14	3.2	Barite	
Pyrite	374	84.9	Garnet	
Garnet	2	0.5	Andalusite	
Andalusite	7	1.6	Clay Minerals	
Leucosene	11	2.5	Quartz	
Limonite Aggregates	32	7.3	Feldspars	
Total	440	100%		

Light Concentrate	No. of Grains	Rel. %	Classification Grouping:	Absol. %
Chert	160	21.1	Pyrite	
Clay Minerals	540	71.0	Limonite Aggregates	
Feldspars	5	0.7	Leucosene	
Quartz	55	7.2	Chert	
Total	760	100%		

Revised Lithologic Description (from descriptive log and laboratory data). 100%

Limestone 85% gray, soft, impure, shaly, fossiliferous, a few crinoid stems; shale, dark gray, soft, calc. most of green, gray shale is conings

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl...15%...%)

- | | | | | |
|--|-----------|--------|-----------------|------|
| 1. Sample weight | 29.96 gm. | 100.0% | 2. Wt. of F. P. | 2.39 |
| 3. Wt. after solution, with filter paper | 7.91 gm. | | | |
| 4. Less wt. F. P. (2) | 2.39 gm. | | | |
| 5. Wt. Insol. Residue (3 minus 4) | 5.52 gm. | 18.4% | | |
| 6. Wt. lost by solution (1 minus 5) | 4.44 gm. | 81.6% | | |
| 7. To balance (5 plus 6) | 29.96 gm. | | | |

Well No. W— 0117
 Depth 636 to 644
 No. samples used 2
 Analyst Scott
 Date 7/11/35

B. Subsidiary:

- | | | |
|---------------------|----------|--------|
| 1. Original Wt. | 5.52 gm. | 100.0% |
| 2. Cylinder (+1/32) | 3.10 gm. | 61.6% |
| 3. Jar (1/32—1/64) | .97 gm. | 8.5% |
| 4. Drain | .65 gm. | 29.9% |

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	2.14	63.1
1/4-1/8 mm	1.25	36.9
1/8-1/16		
Pan		
Total	3.39	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } Sp. gr. Size-Grade(s) 1/4 in mm.

Analyst KUNDERT
 Date JUN. 6, 1935

- Wt. of sample 1.24 gm. 100.0%
- Heavy Minerals .02 gm. 1.6%
- Light Minerals 1.22 gm. 98.4%

Shape Analysis:

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

Minerals Identified:

Heavy Concentrate	No. of Grains	Rel. %
Barite	2	0.4
Pyrite	352	78.1
Garnet	1	0.2
Andalusite	2	0.4
Leucophaea	22	4.9
Limonite Aggregates	72	16.0
Total	451	100%

Classification Grouping:

Primary Minerals:	Absol. %
Andalusite	
Barite	
Garnet	
Clay Minerals	74.9
Quartz	4.4
Feldspar	0.3

Light Concentrate

Light Concentrate	No. of Grains	Rel. %
Chert	205	19.1
Clay Minerals	820	76.2
Feldspar	3	0.3
Quartz	48	4.5
Total	1076	100%

Secondary Minerals: 20.4%

Pyrite	1.2
Limonite Aggregates	0.3
Leucophaea	0.1
Chert	18.8
Total	100%

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

Limestone 80% light gray to cream, brown shaly, tough, finely crystalline; chert 10% ±; shale 5-10%
 Quartz ± 1% clear & crystalline; shale prob. covered

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl.....1.5.....%)

1. Sample weight	30.30 gm.	100.0%	2. Wt. of F. P.	2.32
3. Wt. after solution, with filter paper	8.03 gm.			
4. Less wt. F. P. (2)	2.32 gm.			
5. Wt. Insol. Residue (3 minus 4)	5.71 gm.	18.9%		
6. Wt. lost by solution (1 minus 5)	24.59 gm.	81.1%		
7. To balance (5 plus 6)	30.30 gm.	100.0%		

Well No. W- 0117
 Depth 644 to 659
 No. samples used 7
 Analyst Scott
 Date 3/11/35

B. Subsidiary:

1. Original Wt.	5.71 gm.	100.0%
2. Cylinder (+1/32)	4.04 gm.	70.8%
3. Jar (1/32-1/64)	.43 gm.	7.5%
4. Drain	.24 gm.	4.1%

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	2.80	70.5
1/4-1/8 mm	1.17	29.5
1/8-1/16		
Pan		
Total	3.97	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } 2.93± Sp. gr. Size-Grade(s) 1/4 Pan mm.

Analyst Filasota
 Date June 12-35

Wt. of sample	1.14 gm.	100.0%
Heavy Minerals	.02 gm.	2%
Light Minerals	1.12 gm.	98.2%

Shape Analysis:

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

Minerals Identified:

Heavy Concentrate	No. of Grains	Rel. %
Pyrite	249	74.0
limonite Agg.	63	18.8
Barite	15	4.5
garnet	1	0.3
Anatase	2	0.6
Nornblende	2	0.6
Amphibole	3	0.9
Tourmaline	1	0.3
Total	336	100%
Light Concentrate	No. of Grains	Rel. %
quartz	100	7.5
clay Minerals	1050	80.0
chert	150	11.4
Feldspars	4	0.3
Spherulites	10	0.8
Total	1314	100%

Classification Grouping:

Primary Minerals:	87.1%	Absol. %
Barite		
garnet		
Anatase		
Nornblende		
Amphibole		
Tourmaline		
quartz		7.4
clay minerals		78.6
Feldspars		0.3
Spherulites		0.8
Secondary Minerals:	12.9%	
chert		11.3
Pyrite		1.5
limonite Agg.		0.3

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

LS, 80-90% hard tough gry, fine xline dense; Sh. 15%
 dk gry tablk Calc; Qtz frag 1-2% some clear xstals;
 Chert 2%; Pyrite trace; Fos'ls crinoid stems, fusiline,

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl. 15%)

1. Sample weight	19.49 gm.	100.0%	2. Wt. of F. P. <u>2.40</u>
3. Wt. after solution, with filter paper	13.35 gm.		
4. Less wt. F. P. (2)	2.40 gm.		
5. Wt. Insol. Residue (3 minus 4)	10.95 gm.	56.2%	
6. Wt. lost by solution (1 minus 5)	8.54 gm.	43.8%	
7. To balance (5 plus 6)	19.49 gm.	100.0%	

Well No. W- 0.117
 Depth 659 to 661 1/2
 No. samples used 1
 Analyst Scott
 Date 3/11/35

B. Subsidiation:

1. Original Wt.	10.95 gm.	100.0%
2. Cylinder (+1/32)	8.19 gm.	74.8%
3. Jar (1/32-1/64)	88 gm.	8.0%
4. Drain	1.88 gm.	17.2%

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
3/4-1/2 mm	3.58	44.1
1/4-1/8 mm	4.54	55.9
1/8-1/16		
Pan		
Total	8.12	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } 2.98± Sp. gr. Size-Grade(s) 1/4 Pan mm.

Analyst Filasote
 Date June 12-35

Wt. of sample	3.82 gm.	100.0%
Heavy Minerals	.01 gm.	0.3%
Light Minerals	3.81 gm.	99.7%

Shape Analysis:

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

Minerals Identified;	No. of Grains	Rel. %
Heavy Concentrate		
Epidote	1	0.2
Hornblende	4	1.3
Anatase	8	2.5
Barite	6	1.9
Pyrite	279	88.2
Limonite A99	13	4.1
Leucocena	5	1.5
Total	316	100%
Light Concentrate		
quartz	40	2.7
clay minerals	1200	81.3
chert	225	15.2
Feldspars	5	0.3
Glaucconite	2	0.5
Total	1478	100%

Classification Grouping: 81.5% Absol. %

Primary Minerals:	
Epidote	
Hornblende	
Anatase	
Barite	
Leucocena	
quartz	2.7
clay minerals	81.0
Feldspars	0.3
Glaucconite	0.5

Secondary Minerals: 15.5%

chert	15.2
Limonite A99	
Pyrite	0.3

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

Sh. 75-85% dk gry. Calc. carbonaceous. 30-40% Sol.
Priable. L515-25% gry. fine clinodense. qtz 6% 55.

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl.....15.....%)

- | | | | | |
|--|-----------|--------|-----------------|------|
| 1. Sample weight | 20.10 gm. | 100.0% | 2. Wt. of F. P. | 2.29 |
| 3. Wt. after solution, with filter paper | 15.22 gm. | | | |
| 4. Less wt. F. P. (2) | 2.29 gm. | | | |
| 5. Wt. Insol. Residue (3 minus 4) | 12.93 gm. | 64.4% | | |
| 6. Wt. lost by solution (1 minus 5) | 7.17 gm. | 35.6% | | |
| 7. To balance (5 plus 6) | 20.10 gm. | 100.0% | | |

B. Subsidiary:

- | | | |
|---------------------|-----------|--------|
| 1. Original Wt. | 12.93 gm. | 100.0% |
| 2. Cylinder (+1/32) | 6.76 gm. | 52.3% |
| 3. Jar (1/32-1/64) | 2.52 gm. | 19.5% |
| 4. Drain | 3.65 gm. | 28.2% |

Well No. W- 9117
 Depth 661.5 to 669
 No. samples used
 Analyst Scott
 Date 3/11/35

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	2.94	45.0
1/4-1/8 mm	13.60	55.0
1/8-1/16		
Pan		
Total	16.54	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } 2.923 Sp. gr. Size-Grade(s) 1/4 Pan mm.

Analyst Filasota
 Date Jun 13-35

Wt. of sample 3.55 gm. 100.0%
 Heavy Minerals 1.02 gm. 28.7%
 Light Minerals 2.53 gm. 71.3%

Shape Analysis:

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

Minerals Identified:	No. of Grains	Rel. %
Heavy Concentrate		
Barite	1	0.5
Andalusite	1	0.3
Pyrite	230	77.5
limonite Agg.	65	21.9
Total	297	100%
Light Concentrate		
quartz	90	6.4
clay minerals	1200	85.9
chert	100	7.2
Feldspars	7	0.5
Total	1397	100%

Classification Grouping: Absol. %
 Primary Minerals: 92.2%

Barite
 Andalusite
 quartz 6.4
 clay minerals 85.9
 Feldspars 0.5

Secondary Minerals: 7.8%
 Pyrite 0.5
 limonite Agg. 0.1
 chert 7.2
Total 100%

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

Sh. 90-100% qtz, calc. 30-40% sol friable. Smooth
 ls, 1-8% of fine xline dense; qtz frag. 1-2%; Pyrite
 Trace;

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl...%)

1. Sample weight	20.52 gm.	100.0%	2. Wt. of F. P.	2.14
3. Wt. after solution, with filter paper	14.80 gm.			
4. Less wt. F. P. (2)	2.14 gm.			
5. Wt. Insol. Residue (3 minus 4)	12.66 gm.	61.7%		
6. Wt. lost by solution (1 minus 5)	7.86 gm.	38.3%		
7. To balance (5 plus 6)	20.52 gm.	100.0%		

B. Subsidiary:

1. Original Wt.	12.66 gm.	100.0%
2. Cylinder (+1/32)	6.75 gm.	53.3%
3. Jar (1/32-1/64)	2.20 gm.	17.4%
4. Drain	3.71 gm.	29.3%

Well No. W- 0117
 Depth 672 to 677
 No. samples used 2
 Analyst Scott
 Date 3/11/35

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	2.77	41.4
1/4-1/8 mm	3.95	58.6
1/8-1/16		
Pan		
Total	6.74	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } 2.927 Sp. gr. Size-Grade(s) 1/40 mm.

Analyst Filaseta
 Date June 18-35

Wt. of sample	3.89 gm.	100.0%
Heavy Minerals	.01 gm.	0.3%
Light Minerals	3.88 gm.	99.7%

Shape Analysis:

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

Minerals Identified:

Heavy Concentrate	No. of Grains	Rel. %
Tourmaline	16	2.1
Amphibole	5	0.6
Hornblende	16	2.1
Barite	26	3.3
Biotite	1	0.1
Zircon	30	3.8
Garnet	1	0.1
Kyanite	1	0.1
Pyrite	600	76.9
Lim. Agg	20	5.1
Leucophaea	25	5.8

Classification Grouping:

Primary Minerals:	Absol. %
Tourmaline	0
Amphibole	0
Hornblende	0
Leucophaea	0
Zircon	0
Garnet	0
Kyanite	0
Biotite	0
quartz	50.1
clays. min.	37.9
Feldspars	0.6
Secondary Minerals:	11.4%
chert	0
limonite Agg	0
Pyrite	0.2
Barite	0
Total	100%

Light Concentrate	No. of Grains	Rel. %
quartz	805	50.2
Feldspars	10	0.6
chert	180	11.2
clay minerals	610	38.0
Total	1605	100%

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

L.S. 60-70% qtz, brown, med fine xline; Sh. 30-40% qtz, Calc, mud frag; Pos. if r's

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15%)

1. Sample weight	20.14 gm.	100.0%	2. Wt. of F. P.	2.30
3. Wt. after solution, with filter paper	16.68 gm.			
4. Less wt. F. P. (2)	2.30 gm.			
5. Wt. Insol. Residue (3 minus 4)	14.38 gm.	71.4%		
6. Wt. lost by solution (1 minus 5)	5.76 gm.	28.6%		
7. To balance (5 plus 6)	20.14 gm.			

Well No. W— 0117
 Depth 681 to 686 1/2
 No. samples used 3
 Analyst Scott
 Date 3/1/65

B. Subsidiation:

1. Original Wt.	14.38 gm.	100.0%
2. Cylinder (+1/32)	3.57 gm.	24.8%
3. Jar (1/32—1/64)	3.09 gm.	21.2%
4. Drain	7.77 gm.	54.0%

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	2.19	61.0
1/4-1/8 mm	1.40	39.0
1/8-1/16		
Pan		
Total	3.59	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } 2.93± Sp. gr. Size-Grade(s) 1/4 Pan mm.

Analyst F. LaSota
 Date Nov 13 - 35

Wt. of sample	1.39 gm.	100.0%
Heavy Minerals	0.1 gm.	0.7%
Light Minerals	1.38 gm.	99.3%

Shape Analysis:

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

Minerals Identified:	No. of Grains	Rel. %
Heavy Concentrate		
Leucosane	3	0.7
Zircon	24	5.9
Tourmaline	9	2.0
Amphibole	16	3.6
Kornblende	6	1.4
Barite	23	5.2
Garnet	8	1.8
Biotite	2	0.5
Epidote	2	0.5
Staurolite	1	0.2
Anatase	1	0.2
Kyanite	2	0.5
Pyrite	304	69.5
Limonite Agg	40	9.1
Total	441	100%
Light Concentrate		
quartz	100	7.6
chert	15	1.1
Clay Minerals	1200	90.9
Feldspars	6	0.4

Classification Grouping:	Absol. %
Primary Minerals:	<u>98.3%</u>
clay minerals	90.4
Leucosane	
Zircon	
Tourmaline	
Amphibole	
Kornblende	
Barite	
Garnet	
Biotite	
Epidote	
Staurolite	
Anatase	
Kyanite	
Pyrite	7.5
Secondary Minerals:	<u>1.7%</u>
quartz	0.4
pyrite	0.5
chert	1.1
Limonite Agg	0.1

Total 1.320 100% Total 100%

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

Sh. 85%+ H gray calc, 25-30% Sol. Blocky, LS, 15% of fine xline dense, few qtz frags, fossils

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl...1.5...%)

- | | | | | |
|--|-----------|--------|-----------------|------|
| 1. Sample weight | 30.87 gm. | 100.0% | 2. Wt. of F. P. | 2.16 |
| 3. Wt. after solution, with filter paper | 2.10 gm. | | | |
| 4. Less wt. F. P. (2) | 2.16 gm. | | | |
| 5. Wt. Insol. Residue (3 minus 4) | 5.94 gm. | 19.2% | | |
| 6. Wt. lost by solution (1 minus 5) | 24.93 gm. | 80.8% | | |
| 7. To balance (5 plus 6) | 30.87 gm. | 100.0% | | |

Well No. W- 0117
 Depth 6.86 to 6.88
 No. samples used 1
 Analyst Scott
 Date 3/14/35

B. Subsidiation:

- | | | |
|---------------------|----------|--------|
| 1. Original Wt. | 5.94 gm. | 100.0% |
| 2. Cylinder (+1/32) | 4.37 gm. | 73.5% |
| 3. Jar (1/32-1/64) | 1.55 gm. | 26.0% |
| 4. Drain | 1.02 gm. | 17.2% |

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1-1/4 mm	2.74	65.2
1/4-1/8 mm	1.46	34.8
1/8-1/16		
Pan		
Total	4.20	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } 2.934 Sp. gr. Size-Grade(s) 1/4 Pan mm.

Analyst Filaseta
 Date June 13-35

Wt. of sample 1.46 gm. 100.0%

Shape Analysis:

Heavy Minerals 0.02 gm. 1.4%

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

Light Minerals 1.44 gm. 98.6%

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

Minerals Identified:
 Heavy Concentrate

No. of Grains Rel. %

Classification Grouping:

Absol. %

Barite	9	2.8
Hornblende	11	3.4
garnet	4	1.3
Tourmaline	4	1.2
Zircon	7	2.2
Pyrite	240	75.0
limonite Agg	41	12.8
kaucosene	4	1.3
Total	320	100%

Primary Minerals: 95.8%

Barite	
Hornblende	
garnet	
Tourmaline	
Zircon	
kaucosene	
quartz	14.9
Feldspar	0.7
clay minerals	80.2

Light Concentrate

Chert	38	2.9
quartz	200	15.1
clay minerals	1080	81.3
Feldspar	10	0.7
Total	1328	100%

Secondary Minerals: 4.2%

Chert	2.9
Pyrite	1.1
limonite Agg.	0.2

Total 1328 100% Total 100%

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

L.S. 75-85/olt grey fine xline dense; sh 15-25% gr/y, grn + blk Calc 20-30% Sol. thickly laminated; fossils bryozoa + fusulina.

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15%)

1. Sample weight	20.45 gm.	100.0%	2. Wt. of F. P.	237
3. Wt. after solution, with filter paper	18.98 gm.			
4. Less wt. F. P. (2)	37 gm.			
5. Wt. Insol. Residue (3 minus 4)	16.61 gm.	81.3%		
6. Wt. lost by solution (1 minus 5)	3.84 gm.	18.7%		
7. To balance (5 plus 6)	20.45 gm.	100.0%		

Well No. W- 0117
 Depth 688 to 693
 No. samples used 1
 Analyst Seatt
 Date 3/11/35

B. Subsidiation:

1. Original Wt.	16.61 gm.	100.0%
2. Cylinder (+1/32)	2.27 gm.	43.1%
3. Jar (1/32-1/64)	2.73 gm.	16.4%
4. Drain	7.21 gm.	43.5%

C. Screen Analysis 643

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1-1/4 mm	1.67	25.9
1/4-1/8 mm	4.76	74.1
1/8-1/16		
Pan		
Total	6.43	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. }
~~Bromoform~~ } 93 Sp. gr. Size-Grade(s) 1/4 Pan mm.

Analyst Filaseta
 Date Jan 13-35

Wt. of sample 3.12 gm. 100.0%

Shape Analysis:

Heavy Minerals 0.2 gm. 0.6 %

A. %: a. %: C. %

Light Minerals 3.13 gm. 99.4 %

r. %: R. %

Minerals Identified:

Heavy Concentrate	No. of Grains	Rel. %
limonite Agg.	66	7.4
Sphalerite	10	1.1
Tourmaline	3	0.3
Nornblende	5	0.6
Tremolite	2	0.2
Zircon	2	0.2
garnet	2	0.2
Amphibole	2	0.2
Barite	2	0.2
Andalusite	2	0.1
Pyrite	1	0.1
Total	99	100.0

Classification Grouping:

Primary Minerals: 96.8 %

Absol. %

quartz	2.8
Tourmaline	
Nornblende	
Tremolite	
Zircon	
garnet	
Amphibole	
Barite	
Andalusite	
Leucosane	
Feldspars	0.5
clay minerals	93.0

Light Concentrate	No. of Grains	Rel. %
quartz	45	2.8
chert	47	2.7
Feldspars	8	0.5
clay Minerals	1505	94.0

Secondary Minerals: 2.7 %

Pyrite	0.5
limonite Agg.	
chert	2.7
sphalerite	

Total 1602 100% Total 1602 100%

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

Shale 90-100% blk-gry, carb, calc 10-20% sol,
15 f-10% bf, fine xline dense in small fragments.

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15%)

1. Sample weight	<u>20.22</u> gm.	100.0%	2. Wt. of F. P.	<u>2.17</u>
3. Wt. after solution, with filter paper	<u>18.07</u> gm.			
4. Less wt. F. P. (2)	<u>2.17</u> gm.			
5. Wt. Insol. Residue (3 minus 4)	<u>16.30</u> gm.	<u>80.6</u> %		
6. Wt. lost by solution (1 minus 5)	<u>3.92</u> gm.	<u>19.4</u> %		
7. To balance (5 plus 6)	<u>20.22</u> gm.	<u>100.0</u> %		

Well No. W- 0117
 Depth 693 to 706
 No. samples used _____
 Analyst Scott
 Date 3/1/35

B. Subsidiation:

1. Original Wt.	<u>16.30</u> gm.	100.0%
2. Cylinder (+1/32)	<u>9.05</u> gm.	<u>55.5</u> %
3. Jar (1/32-1/64)	<u>3.68</u> gm.	<u>22.6</u> %
4. Drain	<u>3.57</u> gm.	<u>21.9</u> %

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	<u>2.58</u>	<u>29.2</u>
1/4-1/8 mm	<u>6.27</u>	<u>70.8</u>
1/8-1/16		
Pan		
Total	<u>8</u>	<u>100.0</u>

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } 90% Sp. gr. Size-Grade(s) 1/4 Pan mm.

Analyst Filasetta
 Date Jan 13-35

Wt. of sample 3.05 gm. 100.0%

Shape Analysis:

Heavy Minerals 0.1 gm. 0.7 %

A _____ %: a _____ %: C _____ %

Light Minerals 3.03 gm. 99.3 %

r _____ %: R _____ %

Minerals Identified:
 Heavy Concentrate

Mineral	No. of Grains	Rel. %
Fluorite	2	0.2
Barite	19	2.3
Zircon	13	1.6
Garnet	4	0.5
Amphibole	1	0.1
Sphalerite	8	1.0
tourmaline	12	1.5
Epidote	2	0.2
hornblende	1	0.1
Pyrite	680	83.5
Glauconite	4	0.5
Limonite Agg.	69	8.5
Total	815	100%

Classification Grouping:

Primary Minerals: 96.4 %

Absol. %

Light Concentrate

quartz	208	13.3
chert	40	2.6
Clay minerals	1500	83.2
feldspars	10	0.6
Glauconite	4	0.3

Secondary Minerals: 3.6 %

Fluorite	
Barite	
Zircon	
Garnet	
Amphibole	
tourmaline	
Epidote	
hornblende	
Pyrite	13.2
Glauconite	0.6
feldspars	0.6
Clay minerals	82.6
Secondary Minerals:	3.6%
Pyrite	0.6
Limonite Agg.	0.1
Glauconite	0.3
Chert	2.6
Sphalerite	
Total	100%

Total 1562 100% Total
 Revised Lithologic Description (from descriptive log and laboratory data).

Shale - 90-100% grey calc, 15-25% sol smooth massive; LS 1-7% grey med x line fine firm.

* Fluorite - resembles it. Two grains found only
YOUTZ JEB 9330

MECHANIC

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15.....%)

- | | | | |
|--|------------------|----------------|-----------------------------|
| 1. Sample weight | <u>30.56</u> gm. | 100.0% | 2. Wt. of F. P. <u>2.35</u> |
| 3. Wt. after solution, with filter paper | <u>9.12</u> gm. | | |
| 4. Less wt. F. P. (2) | <u>2.35</u> gm. | | |
| 5. Wt. Insol. Residue (3 minus 4) | <u>6.77</u> gm. | <u>22.2</u> % | |
| 6. Wt. lost by solution (1 minus 5) | <u>23.79</u> gm. | <u>77.8</u> % | |
| 7. To balance (5 plus 6) | <u>30.56</u> gm. | <u>100.0</u> % | |

B. Subsidiation:

- | | | | |
|---------------------------------|-----------------|---------------|--|
| 1. Original Wt. | <u>6.77</u> gm. | 100.0% | |
| 2. Cylinder (+1/32) <u>2.69</u> | <u>5.37</u> gm. | <u>79.3</u> % | |
| 3. Jar (1/32—1/64) <u>2.81</u> | <u>.43</u> gm. | <u>6.4</u> % | |
| 4. Drain <u>2.73</u> | <u>.97</u> gm. | <u>14.3</u> % | |

Well No. W— D117
 Depth 706 to 715
 No. samples used 2
 Analyst Scott
 Date 3/11/25

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1-1/4 mm	<u>3.07</u>	<u>57.7</u>
1/4-1/8 mm	<u>2.25</u>	<u>42.3</u>
1/8-1/16		
Pan		
Total	<u>5.22</u>	<u>100.0</u>

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. }
 Bromoform } 2.92± Sp. gr. Size—44 Pan Grade(s) mm.

Analyst Filasota
 Date June 14-35

- Wt. of sample 2.28 gm. 100.0%
- Heavy Minerals01 gm. 0.4 %
- Light Minerals 2.27 gm. 99.6 %

Shape Analysis:

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

Minerals Identified:
 Heavy Concentrate

No. of Grains	Rel. %
<u>230</u>	<u>74.8</u>
<u>3</u>	<u>0.9</u>
<u>17</u>	<u>5.6</u>
<u>1</u>	<u>0.3</u>
<u>1</u>	<u>0.3</u>
<u>3</u>	<u>0.9</u>
<u>4</u>	<u>1.3</u>
<u>2</u>	<u>0.6</u>
<u>2</u>	<u>0.6</u>
<u>47</u>	<u>15.2</u>
<u>310</u>	<u>100%</u>

Classification Grouping:

Primary Minerals:	Absol. %
<u>93.1</u> %	
<u>epidote</u>	
<u>barite</u>	
<u>staurolite</u>	
<u>amphibole</u>	
<u>hornblende</u>	
<u>garnet</u>	
<u>biotite</u>	
<u>quartz</u>	<u>6.7</u>
<u>clay minerals</u>	<u>86.6</u>
<u>Feldspars</u>	<u>0.8</u>

Light Concentrate

<u>62</u>	<u>6.7</u>
<u>800</u>	<u>86.6</u>
<u>60</u>	<u>6.5</u>
<u>7</u>	<u>0.8</u>

Secondary Minerals: 6.9 %

<u>pyrite</u>	<u>0.3</u>
<u>limonite agg.</u>	<u>0.1</u>
<u>chert</u>	<u>6.5</u>
<u>sphaerulite</u>	

*Total 929 100% Total 100%

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

L5. 80-90% bf to Hgr. fine xline dense; Shale
10-20% Hgr. grn b. calc. 15-20% sol. thinly
laminated; Pyrite tr.; fossil frags brach frags,
crinoid frags; qtz frags 1-5%

DEEP WELL STUDY

MECHANICAL ANALYSIS

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

- | | | | |
|--|-----------|--------|----------------------|
| 1. Sample weight | 20.83 gm. | 100.0% | 2. Wt. of F. P. 2.19 |
| 3. Wt. after solution, with filter paper | 21.11 gm. | | |
| 4. Less wt. F. P. (2) | 2.19 gm. | | |
| 5. Wt. Insol. Residue (3 minus 4) | 18.92 gm. | 90.8% | |
| 6. Wt. lost by solution (1 minus 5) | 1.91 gm. | 9.2% | |
| 7. To balance (5 plus 6) | 20.83 gm. | | |

B. Subsidiary:

- | | | | |
|---------------------|-----------|--------|--|
| 1. Original Wt. | 19.92 gm. | 100.0% | |
| 2. Cylinder (+1/32) | 7.41 gm. | 39.2% | |
| 3. Jar (1/32-1/64) | 3.13 gm. | 16.5% | |
| 4. Drain | 8.38 gm. | 44.3% | |

Well No. W- 0117
 Depth 718 to 721
 No. samples used
 Analyst Scott
 Date 3/11/35

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	2.53	34.5
1/4-1/8 mm	4.80	65.5
1/8-1/16		
Pan		
Total	7.33	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } 2.925 Sp. gr. Size-Grade(s) 1/4 Pan mm.

Analyst Filaseta
 Date June 14-35

Wt. of sample 2.96 gm. 100.0%
 Heavy Minerals .02 gm. 0.7%
 Light Minerals 2.94 gm. 99.3%

Shape Analysis:

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

Minerals Identified;
 Heavy Concentrate

No. of Grains Rel. %

Classification Grouping:
 Primary Minerals: 90.4%

Absol. %

Biot	1	0.1	
Amphibole	1	0.1	
Pyrite	28	7.8	
limonite Agg.	328	91.6	
Total	358	100%	
Light Concentrate			
quartz	63	3.6	
Feldspar	6	0.3	
chert	160	9.1	
clay minerals	530	86.9	
spherulites	2	0.1	

Biotite	
Amphibole	
quartz	3.6
Feldspar	0.3
clay minerals	86.9
spherulites	0.1

Secondary Minerals: 9.6%

Pyrite	0.0
limonite Agg.	0.6
Chert	9.0

Total 1761 100% Total 100%

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

Shale 85-95% red & grey, green Calc., 5-10% Sol
 blocky; 15-10% lt gr med & fine firm; fossils
 Crinoid stem

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15%)

1. Sample weight	<u>19.81</u> gm.	100.0%	2. Wt. of F. P. <u>2.28</u>
3. Wt. after solution, with filter paper	<u>18.23</u> gm.		
4. Less wt. F. P. (2)	<u>2.28</u> gm.		
5. Wt. Insol. Residue (3 minus 4)	<u>15.95</u> gm.	<u>80.5%</u>	
6. Wt. lost by solution (1 minus 5)	<u>3.86</u> gm.	<u>19.5%</u>	
7. To balance (5 plus 6)	<u>19.81</u> gm.	<u>100.0%</u>	

Well No. W— 0117
 Depth 70 to 726
 No. samples used
 Analyst Scott
 Date 3/11/35

B. Subsidiation:

1. Original Wt.	<u>15.95</u> gm.	100.0%
2. Cylinder (+1/32)	<u>5.39</u> gm.	<u>33.7%</u>
3. Jar (1/32—1/64)	<u>2.74</u> gm.	<u>17.2%</u>
4. Drain	<u>7.82</u> gm.	<u>49.1%</u>

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1 -1/4 mm	<u>2.69</u>	<u>51.7</u>
1/4-1/8 mm		<u>48.1</u>
1/8-1/16		
Pan		
Total	<u>5.19</u>	<u>100.0</u>

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } 2.933 Sp. gr. Size-Grade(s) 1/4 Pan mm.

Analyst Filasetta
 Date June 15-35

Wt. of sample 2.5 gm. 100.0%

Shape Analysis:

Heavy Minerals .01 gm. 0.4 %

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

Light Minerals 2.50 gm. 99.6 %

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

Minerals Identified; Heavy Concentrate

No. of Grains Rel. %

Classification Grouping:

Absol. %

Primary Minerals: 96.5 %

Hornblende	3	0.4
Staurolite	1	0.1
Barite	1	0.1
Pyrite	640	84.1
Leucopane	2	0.2
Kimonite Agg.	115	15.1
Total	<u>762</u>	<u>100%</u>

Hornblende	
Staurolite	
Barite	
Leucopane	
quartz	16.0
clay minerals	80.2
Feldspars	0.3

Light Concentrate

quartz	250	16.0
Chert	50	3.2
clay minerals	1260	80.5
Feldspars	5	0.3

Secondary Minerals: 3.5 %

0.19

Total 156 100% Total 100%

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

shale 90-100% med gray calc, 15-25% Sol Blocky
LS 10% of fine xline dense; fossilifer

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15 %)

1. Sample weight 20.74 gm. 100.0%: F. P. 2.19

2. Wt. of

3. Wt. after solution, with filter paper 19.16 gm.

4. Less wt. F. P. (2) 2.19 gm.

5. Wt. Insol. Residue (3 minus 4) 16.97 gm. 81.8 %

6. Wt. lost by solution (1 minus 5) 3.77 gm. 18.2 %

7. To balance (5 plus 6) 20.74 gm. 100.0 %

Well No. W— 0117

Depth 716 to 728

No. samples used

Analyst Scott

Date 3/1/35

B. Subsidiary:

1. Original Wt. 16.97 gm. 100.0%

2. Cylinder (+1/32) 2.03 2.35 5.68 gm. 33.5 %

3. Jar (1/32—1/64) 5.18 3.00 gm. 17.7 %

4. Drain 2.18 8.29 gm. 48.8 %

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	<u>3.05</u>	<u>55.1</u>
1/4-1/8 mm	<u>9.49</u>	<u>44.9</u>
1/8-1/16		
Pan		
Total	5.54	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. }
 Bromoform } 2.96 Sp. gr. Grade(s) 14 Kan mm.

Analyst F. Lasota

Date June 15-35

Wt. of sample 2.48 gm. 100.0% Shape Analysis:

Heavy Minerals 0.1 gm. 0.4 % A. %: a %: C %

Light Minerals 2.4 gm. 99.6 % r %: R %

Minerals Identified: No. of Grains Rel. % Classification Grouping: Absol. %

Heavy Concentrate Primary Minerals: 96.0 %

hornblende	3	0.9
staurolite	1	0.3
barite	2	0.6
pyrite	105	31.3
leucophaea	5	1.5
limonite Agg	220	65.4
Total		100%

hornblende	
staurolite	
barite	
leucophaea	
quartz	<u>2.9</u>
clay minerals	<u>92.8</u>
feldspars	<u>0.3</u>

Light Concentrate Secondary Minerals: 4.0 %

quartz	32	2.9
clay minerals	1040	93.2
chert	40	3.6
feldspars	3	0.3
Total		100%

pyrite	0.3
limonite Agg	0.1
chert	3.6
Total	100%

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

Shale 80-90% red & gray, Calc 15-25% sol, blocky;
LS 10-20% lt gray med. x line dense; few f
green shale; fossils

DEEP WELL STUDY

MECHANICAL ANALYSIS

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

1. Sample weight	<u>20.62</u> gm.	100.0%:	2. Wt. of F. P. <u>2.37</u>
3. Wt. after solution, with filter paper	<u>19.68</u> gm.		
4. Less wt. F. P. (2)	<u>2.37</u> gm.		
5. Wt. Insol. Residue (3 minus 4)	<u>17.31</u> gm.	<u>84.0%</u>	
6. Wt. lost by solution (1 minus 5)	<u>3.31</u> gm.	<u>16.0%</u>	
7. To balance (5 plus 6)	<u>20.62</u> gm.	<u>100.0%</u>	

B. Subsidiation:

1. Original Wt.	<u>17.31</u> gm.	100.0%
2. Cylinder (+1/32)	<u>5.96</u> gm.	<u>34.4%</u>
3. Jar (1/32—1/64)	<u>2.10</u> gm.	<u>12.15%</u>
4. Drain	<u>9.25</u> gm.	<u>53.45%</u>

Well No. W-0117
 Depth 728 to 731 1/2
 No. samples used.....
 Analyst Saett
 Date 3/11/35

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1-1/4 mm	<u>2.58</u>	<u>47.1</u>
1/4-1/8 mm	<u>2.90</u>	<u>52.9</u>
1/8-1/16		
Pan		
Total	<u>48</u>	<u>100.0</u>

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } 2.93± Sp. gr. Size-Grade(s) 1/4 Pan mm.

Analyst Filaset
 Date June 15-35

Wt. of sample	<u>2.88</u> gm.	100.0%
Heavy Minerals	<u>0.1</u> gm.	<u>0.3%</u>
Light Minerals	<u>2.87</u> gm.	<u>99.7%</u>

Shape Analysis:

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

Minerals Identified: Heavy Concentrate

No. of Grains	Rel. %
Amphibole	1 0.2
Epidote	2 6.4
Barite	1 0.2
Limonite Agg.	437 89.0
Pyrite	50 10.1
* Moissanite	1 0.
Total	492 100%

Classification Grouping:

Primary Minerals: 78.4% Absol. %

Amphibole	
Epidote	
Barite	
quartz	<u>8.7</u>
Feldspars	<u>1.4</u>
clay minerals	<u>68.3</u>

Light Concentrate

quartz	91	8.7
chert	225	21.4
Feldspars	15	1.4
clay minerals	720	68.5

Secondary Minerals: 21.6%

pyrite	
limonite Agg	<u>0.2</u>
chert	<u>21.4</u>

Total 1051 100% Total 100%

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

Shale 80-90% gry, calc, 10-20% sol, blocky; LS
1-10% ht, gry, med, xline firm

~~#~~ Moissanite -

~~#~~² Mineral uniaxial +, slightly fibrous, relief high.
Color brown. One grain found.

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15%)

- | | | | | |
|--|-----------|--------|-----------------|------|
| 1. Sample weight | 20.83 gm. | 100.0% | 2. Wt. of F. P. | 2.32 |
| 3. Wt. after solution, with filter paper | 19.36 gm. | | | |
| 4. Less wt. F. P. (2) | 2.32 gm. | | | |
| 5. Wt. Insol. Residue (3 minus 4) | 17.04 gm. | 81.7% | | |
| 6. Wt. lost by solution (1 minus 5) | 3.79 gm. | 18.3% | | |
| 7. To balance (5 plus 6) | 20.83 gm. | 100.0% | | |

Well No. W- 0117

Depth 731 1/2 to 733 1/2

No. samples used 1

Analyst SCOTT

Date 3/11/35

B. Subsidiation:

- | | | |
|---------------------|-----------|--------|
| 1. Original Wt. | 17.04 gm. | 100.0% |
| 2. Cylinder (+1/32) | 7.62 gm. | 44.7% |
| 3. Jar (1/32-1/64) | 3.05 gm. | 17.9% |
| 4. Drain | 6.37 gm. | 37.4% |

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	2.78	39.5
1/4-1/8 mm	4.64	62.5
1/8-1/16		
Pan		
Total	7.42	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } 92+ Sp. gr. Size-Grade(s) 1/4 Pan mm.

Analyst Filasota

Date June 35

Wt. of sample 3.81 gm. 100.0% Shape Analysis:

Heavy Minerals .01 gm. .3 % A.....%: a.....%: C.....%

Light Minerals 3.80 gm. 99.7 % r.....%: R.....%

Minerals Identified; Heavy Concentrate No. of Grains Rel. % Classification Grouping: Primary Minerals: 83.5 % Absol. %

Barite	5	1.2
Zircon	1	0.2
Nornblenda	4	0.9
Epidote	1	0.2
Pyrite	150	35.4
limonite Agg	264	62.1

Zircon	
Nornblenda	
Epidote	
Quartz	1.9
Feldspars	0.3
Clay Minerals	81.3

Total 42 100%

Light Concentrate		
quartz	20	1.9
chert	170	16.3
Feldspars	3	0.3
Clay Minerals	850	81.5

Secondary Minerals: 16.5 %

Barite	
Pyrite	0.1
lim. Agg.	0.2
chert	16.2

Total 043 100% Total Revised Lithologic Description (from descriptive log and laboratory data).

Shale - 90-100% rd + gry calc 15-25% so, blocky, smooth ferruginous; LS 1-10% bf + alt gry, fine line dense; fossils' crinoid stems

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15%)

1. Sample weight 20.23 gm. 100.0%: F. P. 2.20
2. Wt. after solution, with filter paper 13.13 gm.
3. Less wt. F. P. (2) 7.70 gm.
4. Wt. Insol. Residue (3 minus 4) 10.93 gm. 54.0%
5. Wt. lost by solution (1 minus 5) 9.30 gm. 46.0%
6. To balance (5 plus 6) 20.23 gm. 100.0%

B. Subsidiation:

1. Original Wt. 10.93 gm. 100.0%
2. Cylinder (+1/32) 9.09 2.19 6.90 gm. 63.1%
3. Jar (1/32-1/64) 3.38 1.03 gm. 9.4%
4. Drain 3.00 gm. 27.5%

Well No. W- 0117

Depth 733 1/2 to 737

No. samples used

Analyst Scott

Date 3/4/20

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1-1/4 mm	<u>4.39</u>	<u>15.0</u>
1/4-1/8 mm	<u>2.36</u>	<u>35.0</u>
1/8-1/16		
Pan		
Total	<u>6.75</u>	<u>100.0</u>

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. }
 Bromoform } 92+ Sp. gr. Size-Grade(s) 1/4 Pan mm.

Analyst Filadate

Date June 18-3

Wt. of sample 2.33 gm. 100.0%

Shape Analysis:

Heavy Minerals01 gm. 0.4%

A. %: a %: C %

Light Minerals 2.32 gm. 99.6%

r %: R %

Minerals Identified:
 Heavy Concentrate

	No. of Grains	Rel. %
Andalusite	1	0.2
garnet	4	1.0
Basite	5	1.3
Hornblende	10	2.6
Zircon	3	0.8
Epidote	3	0.8
Biotite	1	0.2
Diopside	1	0.3
Pyrite	268	69.0
Leucosphaerite	2	0.5
Himonite Agg.	27	25.0
Total	<u>388</u>	<u>100%</u>

Classification Grouping:

Absol. %

Primary Minerals: 60.3%

Light Concentrate

quartz	110	1.6
chert	600	39.5
clay	800	52.7
Foldspars	8	0.5

Secondary Minerals: 39.7%

Total 1518 100% Total

100%

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

Shale 90-100% br + gry Cal 25-35% dol ferruginous blocky; h s 1-10% abt to lt gry fine xline dense; fos'ls, crinoid stems; qtz frag + Pyrite trace.

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl) 15%

- | | | | |
|--|------------------|---------------|-----------------------------|
| 1. Sample weight | <u>20</u> gm. | 100.0% | 2. Wt. of F. P. <u>2.37</u> |
| 3. Wt. after solution, with filter paper | <u>17.89</u> gm. | | |
| 4. Less wt. F. P. (2) | <u>2.37</u> gm. | | |
| 5. Wt. Insol. Residue (3 minus 4) | <u>15.52</u> gm. | <u>76.6%</u> | |
| 6. Wt. lost by solution (1 minus 5) | <u>4.75</u> gm. | <u>23.4%</u> | |
| 7. To balance (5 plus 6) | <u>20.27</u> gm. | <u>100.0%</u> | |

Well No. W— 0117
 Depth 737 to 739
 No. samples used 1
 Analyst Scott
 Date 3/11/35

B. Subsidiary:

- | | | |
|---------------------|------------------|--------------|
| 1. Original Wt. | <u>15.52</u> gm. | 100.0% |
| 2. Cylinder (+1/32) | <u>7.77</u> gm. | <u>50.1%</u> |
| 3. Jar (1/32—1/64) | <u>1.86</u> gm. | <u>12.0%</u> |
| 4. Drain | <u>5.89</u> gm. | <u>37.9%</u> |

C. Screen Analysis 7.50

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1-1/4 mm	<u>3.84</u>	<u>52.0</u>
1/4-1/8 mm	<u>3.51</u>	<u>48.0</u>
1/8-1/16		
Pan		
Total	<u>7.38</u>	<u>100.0</u>

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } 2.93± Sp. gr. Size-Grade(s) 1/4 Pan mm.

Analyst Filadelfa
 Date June-18-35

Wt. of sample 3.53 gm. 100.0%
 Heavy Minerals 0 gm. 0%
 Light Minerals 3.52 gm. 99.7%

Shape Analysis:

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

Minerals Identified:
 Heavy Concentrate

No. of Grains Rel. %

Classification Grouping:

Absol. %

Primary Minerals: 83.8%

garnet	2	0.3
zircon	1	0.1
spinel	1	0.1
epidote	1	0.1
andalusite	1	0.1
tourmaline	1	0.1
clinzoisite	1	0.1
sphalerite	3	0.3
andalusite	1	0.1
biotite	1	0.1
quartz	222	37.5
limonite Agg.	224	37.5
Total	<u>592</u>	<u>100%</u>

garnet		
zircon		
spinel		
andalusite		
tourmaline		
clinzoisite		
andalusite		
biotite		
leucophaea		
feldspar		0.6
quartz		5.2
clay minerals		78.0

Light Concentrate

Secondary Minerals: 16.2%

garnet	220	16.0
feldspar	8	0.6
quartz	72	5.2
clay minerals	<u>1080</u>	<u>78.2</u>

Basalt		
quartz		0.1
pyrite		
limonite Agg.		0.1
chert		16.0

Total 1380 100% Total 100%
 Revised Lithologic Description (from descriptive log and laboratory data).

Shale 90-100% br to gray Calc - 20-30% S
ferruginous, blocky; LS 1-10% bf med
firm, fossiliferous, crinoid stems.

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl) 15 %

1. Sample weight 20.06 gm. 100.0%: F. P. 2.28
2. Wt. of
3. Wt. after solution, with filter paper 19.90 gm.
4. Less wt. F. P. (2) 2.28 gm.
5. Wt. Insol. Residue (3 minus 4) 17.62 gm. 87.9 %
6. Wt. lost by solution (1 minus 5) 2.44 gm. 12.1 %
7. To balance (5 plus 6) 20.06 gm. 100.0 %

B. Subsidiation:

1. Original Wt. 17.62 gm. 100.0%
2. Cylinder (+1/32) 9.13 6.95 gm. 39.4 %
3. Jar (1/32—1/64) 2.18 4.71 2.38 gm. 13.5 %
4. Drain 2.33 8.29 gm. 47.1 %

Well No. W- 0117

Depth 739 to 743

No. samples used

Analyst Scott

Date 3/28/35

C. Screen Analysis 6.78

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	<u>2.23</u>	
1/4-1/8 mm	<u>1.43</u>	
1/8-1/16	<u>2.00</u>	
Pan	<u>1.03</u>	
Total	<u>6.69</u>	<u>100.0</u>

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

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

Analyst Filasota
Date June 18-35

Wt. of sample 2.96 gm. 100.0%

Shape Analysis:

Heavy Minerals 61 gm. 0.3 %

A. %: a %: C %

Light Minerals 95 gm. 99.7 %

r %: R %

Minerals Identified:
Heavy Concentrate

Mineral	No. of Grains	Rel. %
Staurolite	<u>8</u>	<u>0.8</u>
Diopside	<u>1</u>	<u>0.1</u>
Tourmaline	<u>70</u>	<u>6.8</u>
Zircon	<u>175</u>	<u>17.1</u>
Garnet	<u>44</u>	<u>9.3</u>
Barite	<u>50</u>	<u>4.9</u>
Nonblende	<u>2</u>	<u>0.2</u>
Pyrite	<u>550</u>	<u>53.6</u>
Leucophaea	<u>70</u>	<u>6.8</u>
Himantite Agg.	<u>53</u>	<u>5.4</u>
Total	<u>1025</u>	<u>100%</u>

Classification Grouping:

Absol. %

Primary Minerals: 96.5 %

Staurolite	
Diopside	
Tourmaline	
Zircon	
Garnet	
Barite	
Nonblende	
Leucophaea	
quartz	<u>45.0</u>
clay minerals	<u>45.0</u>
Feldspars	<u>6.5</u>

Light Concentrate

quartz	<u>1400</u>	<u>45.1</u>
clay minerals	<u>1400</u>	<u>45.1</u>
chert	<u>100</u>	<u>3.3</u>
Feldspars	<u>200</u>	<u>6.5</u>

Secondary Minerals: 3.5 %

chert	<u>3.3</u>
Pyrite	<u>0.2</u>
Himantite Agg.	

Total 3100 100% Total 100%

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

Shale 85-95% Calc 10-20% Sol Blacky, LS-5-10%
gr, fine, xline dense fossils

DEEP WELL STUDY

MECHANICAL ANALYSIS

- A. Acid treatment (HCl 15%)
1. Sample weight 20.06 gm. 100.0%: 2. Wt. of F. P. 2.28
 3. Wt. after solution, with filter paper 19.90 gm.
 4. Less wt. F. P. (2) 2.28 gm.
 5. Wt. Insol. Residue (3 minus 4) 17.62 gm. 87.1%
 6. Wt. lost by solution (1 minus 5) 2.44 gm. 12.1%
 7. To balance (5 plus 6) 20.06 gm. 100.0%

Well No. W- 047
 Depth 739 to 713
 No. samples used.
 Analyst Scott
 Date 3/25/35

- B. Subsidiation:
1. Original Wt. 17.62 gm. 100.0%
 2. Cylinder (+1/32) 9.13 6.45 gm. 39.4%
2.18
4.21
 3. Jar (1/32—1/64) 2.38 gm. 13.5%
2.33
 4. Drain 8.29 gm. 47.1%

C. Screen Analysis 6.78

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	<u>2.23</u>	
1/4-1/8 mm	<u>1.43</u>	
1/8-1/16	<u>2.00</u>	
Pan	<u>1.03</u>	
Total	<u>6.69</u>	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 Pan mm.

Analyst Filaretta
 Date June 18-35

Wt. of sample 2.96 gm. 100.0% Shape Analysis:
 Heavy Minerals 1 gm. 0.3% A.%: a.%: C.%
 Light Minerals 2.95 gm. 99.7% r%: R%

Minerals Identified:	No. of Grains	Rel. %	Classification Grouping:	Absol. %	
Heavy Concentrate					
Staurolite	8	0.8	Primary Minerals: <u>96.5</u> %		
Diopside	1	0.1		Staurolite	
Tourmaline	10	6.8		Diopside	
Zircon	175	17.1		Tourmaline	
Garnet	44	4.3		Zircon	
Barite	50	4.9		Garnet	
Nonblend	2	0.2		Barite	
Pyrite	500	53.6		Nonblend	
Leucophaea	70	6.8		Pyrite	45.0
Kimono Agg.	53	5.2		Leucophaea	45.0
Total	1025	100%	Quartz	6.5	
Light Concentrate					
Quartz	1400	45.1	Secondary Minerals: <u>3.5</u> %		
Clay minerals	1400	45.1	Chert	3.3	
Chert	100	3.2	Pyrite	0.2	
Feldspars	200	6.5	Kimono Agg.		
Total	3100	100%	Total	100%	

Revised Lithologic Description (from descriptive log and laboratory data).
Shale 85-95% Calc 10-20% Sol Blocky, LS-5-10%
gray, fine, aline dense fossils

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl.....15%.)

- | | | | | |
|--|-----------|--------|-----------------|------|
| 1. Sample weight | 20.92 gm. | 100.0% | 2. Wt. of F. P. | 2.31 |
| 3. Wt. after solution, with filter paper | 18.08 gm. | | | |
| 4. Less wt. F. P. (2) | 2.31 gm. | | | |
| 5. Wt. Insol. Residue (3 minus 4) | 15.77 gm. | 75.4% | | |
| 6. Wt. lost by solution (1 minus 5) | 5.15 gm. | 24.6% | | |
| 7. To balance (5 plus 6) | 20.92 gm. | 100.0% | | |

B. Subsidiation:

- | | | | | |
|-------------------------------|-----------|--------|--|--|
| 1. Original Wt. | 15.77 gm. | 100.0% | | |
| 2. Cylinder (+1/32) | 9.05 gm. | 62.5% | | |
| 3. Jar (1/32-1/64) | 2.19 gm. | 13.9% | | |
| 4. Drain | 3.73 gm. | 23.6% | | |

Well No. W- 0117

Depth 743 to 760

No. samples used

Analyst S. C. O.

Date 5/20/55

C. Screen Analysis 9.81

SIZE GRAMS %

2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	2.08	
1/4-1/8 mm	2.24	
1/8-1/16	2.69	
Pan	2.63	
Total	9.64	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. }
 Bromoform } 2.934 Sp. gr. Size-Grade(s) 1/8-1/16 mm.

Wt. of sample 2.65 gm. 100.0%
 Heavy Minerals 0.1 gm. 0.4%
 Light Minerals 2.64 gm. 99.6%

Shape Analysis:

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

Minerals Identified:

Heavy Concentrate	No. of Grains	Rel. %
Lowicron	45	4.0
Tourmaline	30	2.6
Zircon	48	4.2
Garnet	19	1.0
Barite	30	2.6
Nonblende	14	1.2
zoisite	1	0.1
Staurolite	3	0.3
epidote	1	0.1
Andalusite	1	0.1
Biotite	3	0.3
Pyrite	800	70.4
limonite Agg.	178	15.9
Total	1135	100%
Light Concentrate		
quartz	200	11.8
Feldspars	78	4.7
chert	80	4.7
clayminerals	1400	82.4

Classification Grouping:

Primary Minerals:	94.9%	Absol. %
Lowicron		
Tourmaline		
Zircon		
Garnet		
Nonblende		
Barite		
zoisite		
Staurolite		
epidote		
Andalusite		
zoisite		
Feldspars		
quartz		
clayminerals		
Secondary Minerals:	5.1%	
chert		4.7
Pyrite		11.8
limonite Agg.		82.0

Total 1698 100% Total 100%

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

Sh. 90-100% white to light gray, greenish, calc 10-15% Sol
 blocky, h.S. 1-10% bf. fine xline, dense; qtz frag;
 fossils - crinoid stems, fus. lina; Pyrite tr.

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15%)

- | | | | |
|--|------------------|----------------|-----------------------------|
| 1. Sample weight | <u>20.44</u> gm. | 100.0% | 2. Wt. of F. P. <u>2.29</u> |
| 3. Wt. after solution, with filter paper | <u>18.74</u> gm. | | |
| 4. Less wt. F. P. (2) | <u>2.29</u> gm. | | |
| 5. Wt. Insol. Residue (3 minus 4) | <u>16.45</u> gm. | <u>80.5</u> % | |
| 6. Wt. lost by solution (1 minus 5) | <u>3.99</u> gm. | <u>19.5</u> % | |
| 7. To balance (5 plus 6) | <u>20.44</u> gm. | <u>100.0</u> % | |

B. Subsidiary:

- | | | |
|---------------------|------------------|---------------|
| 1. Original Wt. | <u>16.45</u> gm. | 100.0% |
| 2. Cylinder (+1/32) | <u>9.97</u> gm. | <u>60.6</u> % |
| 3. Jar (1/32-1/64) | <u>2.11</u> gm. | <u>12.8</u> % |
| 4. Drain | <u>4.37</u> gm. | <u>26.6</u> % |

Well No. W- 0117

Depth 76.2 to 77.3

No. samples used 5

Analyst Scott

Date 3/29/35

C. Screen Analysis 9.86

SIZE GRAMS %

2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	<u>3.42</u>	<u>34.8</u>
1/4-1/8 mm	<u>2.20</u>	<u>22.5</u>
1/8-1/16	<u>2.35</u>	<u>24.0</u>
Pan	<u>1.83</u>	<u>18.7</u>
Total	<u>9.80</u>	<u>100.0</u>

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } 2.98± Sp. gr. Size-Grade(s) 3-5 mm.

Wt. of sample 2.28 gm. 100.0%

Heavy Minerals .03 gm. 1.3%

Light Minerals 2.25 gm. 98.7%

Minerals Identified;

Heavy Concentrate	No. of Grains	Rel. %
Barite	8	0.8
Sphalerite	1	0.1
Garnet	5	0.5
Tourmaline	1	0.1
Monazite	2	0.2
Epidote	1	0.1
Zircon	2	0.2
Pyrite	900	92.5
Limonite Agg.	48	4.9
Total	<u>974</u>	<u>100%</u>

Shape Analysis:

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

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

Classification Grouping:

Primary Minerals: 91.3%

Absol. %

Barite	
Sphalerite	
Pyrite	10.2
Limonite Agg.	79.1
Clay Minerals	1.4
Feldspars	1.4
Glauconite	0.6

Light Concentrate

Quartz	110	10.3
Chert	80	7.5
Clay Min.	860	80.2
Feldspars	15	1.4
Glauconite	6	0.6

Secondary Minerals: 8.7%

Barite	
Sphalerite	
Pyrite	1.2
Limonite Agg.	0.1
Chert	7.4

Total 1071 100%

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

Shale 90-100% Al gray Calc. 10-15% sol blocky firm;
LS-1-10% bf, fine line dense; qtz frag 1-2%;
Pyrite Tr; fos'lt's, Crinoid stems, Fusulina, Bryozoa

100%

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl 1.5%)

1. Sample weight	20.94 gm.	100.0%	2. Wt. of F. P.	2.23
3. Wt. after solution, with filter paper	19.65 gm.			
4. Less wt. F. P. (2)	2.23 gm.			
5. Wt. Insol. Residue (3 minus 4)	17.32 gm.	82.7%		
6. Wt. lost by solution (1 minus 5)	3.62 gm.	17.3%		
7. To balance (5 plus 6)	0.94 gm.	100.0%		

Well No. W— 0117

Depth 773 to 776

No. samples used 1

Analyst Scott

Date 3/20/35

B. Subsidiation:

1. Original Wt.	17.32 gm.	100.0%
2. Cylinder (+1/32)	9.87 gm.	56.9%
	2.15 gm.	12.4%
	4.17 gm.	24.0%
3. Jar (1/32—1/64)	1.47 gm.	8.5%
	2.00 gm.	11.5%
4. Drain	8.13 gm.	46.9%

C. Screen Analysis 758

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	4.24	56.0
1/4-1/8 mm	1.02	13.5
1/8-1/16	.95	12.5
Pan	1.36	18.0
Total	7.57	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } Sp. gr. Size-Grade(s) 1/4-1/8 mm.

Analyst Filaretta

Date 35

Wt. of sample 1.88 gm. 100.0% Shape Analysis:

Heavy Minerals 1.6 gm. 85.1% A.....%: a.....%: C.....%

Light Minerals 98.4 gm. 52.3% r.....%: R.....%

Minerals Identified: Heavy Concentrate No. of Grains Rel. % Classification Grouping: Primary Minerals: 89.7% Absol. %

Pyrite	277	73.7
Limonite Agg	96	25.5
Leucosane	2	0.5
Sphalerite	1	0.3

Leucosane	8.9
Quartz	1.0
Feldspar	19.8
Clay Minerals	

Total 376 100%

Light Concentrate		
quartz	140	9.0
Chert	138	8.9
Feldspar	15	1.0
Claymin.	1260	81.1

Secondary Minerals: <u>10.3</u> %	
Pyrite	1.2
Limonite Agg	0.4
Sphalerite	
Chert	5.9
Total	100%

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

Shale, 90-100% H. gray green, Calc. 15-20% Sol. Black,
firm; 151-10% bf. gray med x line firm; fossils
crinoid stems.

DEEP WELL STUDY

MECHANICAL ANALYSIS

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

1. Sample weight 20.11 gm. 100.0% : 2. Wt. of F. P. 2.29
3. Wt. after solution, with filter paper 15.23 gm.
4. Less wt. F. P. (2) 2.29 gm.
5. Wt. Insol. Residue (3 minus 4) 12.94 gm. 64.4 %
6. Wt. lost by solution (1 minus 5) 7.17 gm. 35.6 %
7. To balance (5 plus 6) 20.11 gm. 100.0 %

B. Subsidiation:

1. Original Wt. 12.94 gm. 100.0%
6.90
2. Cylinder (+1/32) 4.63 gm. 35.8 %
2.27
4.92
3. Jar (1/32--1/64) 2.57 gm. 19.8 %
2.35
4. Drain 7.4 gm. 44.4 %

Well No. W— 0117

Depth 776 to 780

No. samples used 2

Analyst Scott

Date 3/29/35

C. Screen Analysis 4.52

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2+1/4 mm	<u>.20</u>	<u>27.0</u>
1/4-1/8 mm	<u>.92</u>	<u>20.7</u>
1/8-1/16	<u>.10</u>	<u>24.8</u>
Pan	<u>1.22</u>	<u>27.5</u>
Total	<u>4.44</u>	<u>100.0</u>

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. }
 Bromoform } 2.93 Sp. gr. Size-Grade(s) to mm.

Wt. of sample 2.11 gm. 100.0%

Heavy Minerals03 gm. 1.4 %

Light Minerals 2.08 gm. 98.6 %

Minerals Identified:

Minerals Identified:	No. of Grains	Rel. %
Heavy Concentrate		
quartz	<u>1</u>	<u>0.8</u>
pyrite	<u>250</u>	<u>81.0</u>
Limonite Agg	<u>58</u>	<u>18.8</u>
Total	<u>309</u>	<u>100%</u>

Light Concentrate

quartz	<u>135</u>	<u>9.6</u>
clay minerals	<u>910</u>	<u>64.4</u>
fold spars	<u>360</u>	<u>25.5</u>
quartz	<u>7</u>	<u>0.5</u>
Total	<u>1412</u>	<u>100%</u>

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

Shale 90-10070 1/2 grey Calc. 25-35% Sol-blocky, firm; L5 1-1070 grey med sline firm, dense

Analyst Filipota

Date June 21-35

Shape Analysis:

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

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

Classification Grouping:

Primary Minerals: 35.1 %

Absol. %

quartz 9.6
 clay minerals 25.1
 fold spars 0.5
 quartz

Secondary Minerals: 64.9 %

Limonite Agg 0.3
 pyrite 1.1
 chert 63.5

Total 100%

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl...%)

- | | | | | |
|--|-----------|--------|-------------------------|--|
| 1. Sample weight | 20.6 gm. | 100.0% | 2. Wt. of F. P. | |
| 3. Wt. after solution, with filter paper | 16.56 gm. | | | |
| 4. Less wt. F. P. (2) | 2.31 gm. | | | |
| 5. Wt. Insol. Residue (3 minus 4) | 14.25 gm. | 69.1% | | |
| 6. Wt. lost by solution (1 minus 5) | 6.36 gm. | 30.9% | | |
| 7. To balance (5 plus 6) | 20.6 gm. | 100.0% | | |

B. Subsidiation:

- | | | | | |
|-------------------------------|-----------|--------|--|--|
| 1. Original Wt. | 14.25 gm. | 100.0% | | |
| 2. Cylinder (+1/32) | 7.09 gm. | 49.7% | | |
| 3. Jar (1/32—1/64) | 2.41 gm. | 16.9% | | |
| 4. Drain | 4.75 gm. | 33.4% | | |

Well No. W— D617
 Depth 780 to 781
 No. samples used 1
 Analyst Scott
 Date 3/29/35

C. Screen Analysis 6.93

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	3.11	47.2
1/4-1/8 mm	1.26	19.2
1/8-1/16	.12	1.0
Pan	1.09	16.6
Total	6.58	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } 2.93± Sp. gr. Size-Grade(s) 1/4-1/8 mm.

Wt. of sample 2.43 gm. 100.0% Shape Analysis:

Heavy Minerals02 gm. 0.8 % A. %: a %: C %

Light Minerals 2.41 gm. 99.2 % r %: R %

Minerals Identified: No. of Grains Rel. % Classification Grouping: Absol. %

Minerals Identified:	No. of Grains	Rel. %	Classification Grouping:	Absol. %
Heavy Concentrate			Primary Minerals: <u>76.1</u> %	
<u>Sphalerite</u>	1	0.2	<u>garnet</u>	
<u>garnet</u>	1	0.2	<u>Hornblende</u>	
<u>Barite</u>	2	0.4	<u>Leucocane</u>	
<u>Hornblende</u>	2	0.4	<u>Clay Minerals</u>	71.9
<u>Pyrite</u>	420	86.4	<u>quartz</u>	4.2
<u>Limonite Agg.</u>	64	13.0		
<u>Leucocane</u>	2	0.4		
Total	492	100%	Secondary Minerals: <u>23.9</u> %	
Light Concentrate			<u>Bavite</u>	
<u>quartz</u>	50	4.2	<u>Sphalerite</u>	0.7
<u>Chert</u>	280	23.3	<u>Pyrite</u>	0.1
<u>Clay Minerals</u>	870	72.5	<u>Limonite Agg.</u>	
			<u>chert</u>	23.1
Total	1200	100%	Total	100%

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

Shale 90-10090 dk red gray. granh calc. 25-30%
Solids 1-1090 bt fine xline dense. fossils, Crinoid stem

DEEP WELL STUDY

MECHANICAL ANALYSIS

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

1. Sample weight	20.42 gm.	100.0%	2. Wt. of F. P.	2.27
3. Wt. after solution, with filter paper	15.36 gm.			
4. Less wt. F. P. (2)	2.27 gm.			
5. Wt. Insol. Residue (3 minus 4)	13.09 gm.	64.0%		
6. Wt. lost by solution (1 minus 5)	7.33 gm.	36.0%		
7. To balance (5 plus 6)	20.42 gm.	100%		

Well No. W- 0117
 Depth 781 to 785
 No. samples used
 Analyst Scott
 Date 3/6/35

C. Screen Analysis 7.68

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	1.33	17.7
1/4-1/8 mm	1.25	16.7
1/8-1/16	2.53	33.7
Pan	2.40	31.9
Total	7.51	100.0

B. Subsidiation:

1. Original Wt.	13.09 gm.	100.0%
2. Cylinder (+1/32)	7.66 gm.	58.6%
3. Jar (1/32-1/64)	2.06 gm.	15.7%
4. Drain	3.37 gm.	25.7%

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. }
 Bromoform } 2.935 Sp. gr. Size-Grade(s) 1/16 mm.

Analyst Filaseta
 Date June 21, 35

Wt. of sample 2.55 gm. 100.0% Shape Analysis:

Heavy Minerals .03 gm. 1.2% A. %: a. %: C. %

Light Minerals 2.52 gm. 98.8% r. %: R. %

Minerals Identified:

Heavy Concentrate	No. of Grains	Rel. %
Pyrrite	800	89.8
Limonite Agg	45	0.1
garnet	9	1.0
Zircon	7	0.8
Rutile	1	0.1
Tourmaline	5	0.6
Barite	7	0.8
Biotite	2	0.2
Sphalerite	2	0.2
Staurolite	1	0.1
Hornblende	2	0.2
Total	891	100%

Classification Grouping:

Primary Minerals: 92.1% Absol. %

Light Concentrate	No. of Grains	Rel. %
quartz	553	26.5
chert	120	5.8
claymin	1360	65.8
Feldspars	99	1.4
spherulites	20	1.0
Total	2082	100%

Secondary Minerals: 7.9%
 Barite
 Pyrite
 Limonite Agg
 Sphalerite
 chert

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

Shale, 90-100% gray gran, calc. 20-30% sil,
 firm blocky LS 1-10% bf fine xline dense,
 fo = 1 frs, crinoid stems

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15%)

1. Sample weight	20.96 gm.	100.0%	2. Wt. of F. P.	2.30
3. Wt. after solution, with filter paper	15.06 gm.			
4. Less wt. F. P. (2)	2.30 gm.			
5. Wt. Insol. Residue (3 minus 4)	13.76 gm.	65.1%		
6. Wt. lost by solution (1 minus 5)	7.20 gm.	34.4%		
7. To balance (5 plus 6)	20.96 gm.	100.0%		

B. Subsidiation:

1. Original Wt.	13.76 gm.	100.0%
2. Cylinder (+1/32)	9.19 gm.	66.7%
3. Jar (1/32-1/64)	10.2 gm.	7.5%
4. Drain	3.54 gm.	25.8%

Well No. W- 0117

Depth 785 to 788

No. samples used 1

Analyst Scott

Date 3/29/35

C. Screen Analysis 8.78

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	1.32	15.2
1/4-1/8 mm	3.31	38.1
1/8-1/16	3.29	27.9
Pan	.77	8.8
Total	8.69	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform { 2.93 Sp. gr. Grade(s) 1/8-1/16 mm.

Wt. of sample 3.40 gm. 100.0% Shape Analysis:

Heavy Minerals .03 gm. 0.9% A.%: a.%: C.%

Light Minerals 3.37 gm. 99.1% r.%: R.%

Minerals Identified: Heavy Concentrate

No. of Grains Rel. %

Classification Grouping:

Absol. %

Quartz	25	1.8
Garnet	55	3.9
Hornblende	24	1.7
Zircon	31	3.6
Andalusite	1	0.1
Tourmaline	39	2.8
Staurolite	14	1.0
Biotite	3	0.2
Spinel	4	0.3
Pyrite	2	0.1
Other	2	0.1
Total	140	100%

Primary Minerals: 90.3%

Light Concentrate

Chert	216	72.9
Pyrite	262	8.8
Feldspar	180	6.1
Clay minerals	360	12.2
Total	2962	100%

Secondary Minerals: 9.6%

Garnet
 Hornblende
 Zircon
 Andalusite
 Tourmaline
 Staurolite
 Biotite
 Spinel
 Pyrite
 Other
 Feldspar 6.1
 Clay minerals 12.1

Total 2962 100% Total

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

5.70-80% buff, xln. dense; Shale 10-20% grn, Calc
10-15% sol. friable; gr. sand 1-10% Major grd,
1/4-1/8; pyrite, tr. fossilifer, Crinoid stems, bryozoa,
Gastropod, Cephalopod

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl 1.5%)

- | | | | | |
|--|-----------|--------|-----------------|------|
| 1. Sample weight | 19.65 gm. | 100.0% | 2. Wt. of F. P. | 2.30 |
| 3. Wt. after solution, with filter paper | 17.75 gm. | | | |
| 4. Less wt. F. P. (2) | 2.30 gm. | | | |
| 5. Wt. Insol. Residue (3 minus 4) | 15.45 gm. | 78.6% | | |
| 6. Wt. lost by solution (1 minus 5) | 4.2 gm. | 21.4% | | |
| 7. To balance (5 plus 6) | 19.6 gm. | 100.0% | | |

B. Subsidiation:

- | | | |
|---------------------|-----------|--------|
| 1. Original Wt. | 15.45 gm. | 100.0% |
| 2. Cylinder (+1/32) | 7.75 gm. | 50.2% |
| 3. Jar (1/32-1/64) | 2.61 gm. | 13.1% |
| 4. Drain | 5.09 gm. | 32.9% |

Well No. W- 0117

Depth 788 to 795

No. samples used 2

Analyst Scott

Date 3/29/35

C. Screen Analysis 52

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm	.36	4.8
1/2-1/4 mm	.75	10.0
1/4-1/8 mm	1.11	14.8
1/8-1/16	2.23	29.8
Pan	3.05	40.6
Total	7.50	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } 2.934 Sp. gr. Size-Grade(s) 1/8-1/16 mm.

Wt. of sample 2.17 gm. 100.0%

Heavy Minerals 0.005 gm. 0.23 %

Light Minerals 2.165 gm. 99.77 %

Minerals Identified:
Heavy Concentrate

No. of Grains Rel. %

Staurolite	4	0.5
Barite	19	2.2
Garnet	20	2.3
Epidote	5	0.6
Zircon	21	2.4
Tourmaline	38	4.3
Biotite	7	0.8
Andalusite	1	0.1
Rutile	1	0.1
Hornblende	9	1.0
Pyrite	520	62.4
Himonite Agg	720	15.6
Chert	22	9.7
Total	880	100%

Light Concentrate

quartz	910	47.1
chert	105	5.4
Feldspars	150	7.8
Clay minerals	765	39.7

Total 19.80 100% Total 100%

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

Shale 97-100% N. gray calc, 15-20% Sal, blacky, Micas, ls. 1-3% buffine, xline, dense

Analyst Filajeta

Date June 24-35

Shape Analysis:

A.%: a.%: C.%

r.%: R.%

Classification Grouping:

Primary Minerals: 94.5 %

Absol. %

Barite
Staurolite
Garnet
Epidote
Zircon
Tourmaline
Biotite
Andalusite
Rutile
Hornblende
Hyalocane
Pyrite

Feldspars 7.8
Clay minerals 39.6

Secondary Minerals: 5.5 %

Pyrite oil
Himonite Agg.
Chert 5.4

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl...%)

1. Sample weight	20.97 gm.	100.0%	2. Wt. of F. P.	2.20
3. Wt. after solution, with filter paper	18.26 gm.			
4. Less wt. F. P. (2)	2.20 gm.			
5. Wt. Insol. Residue (3 minus 4)	16.06 gm.	77.0%		
6. Wt. lost by solution (1 minus 5)	4.91 gm.	23.4%		
7. To balance (5 plus 6)	20.97 gm.	100.0%		

Well No. W- 0117

Depth 795 to 799

No. samples used 1

Analyst Scott

Date 3/29/35

C. Screen Analysis 6.3

SIZE GRAMS %

2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	1.33	
1/4-1/8 mm	.91	
1/8-1/16	2.03	
Pan	2.02	
Total	6.29	100.0

B. Subsidiation:

1. Original Wt.	16.06 gm.	100.0%
2. Cylinder (+1/32)	6.51 gm.	40.6%
3. Jar (1/32-1/64)	3.02 gm.	18.8%
4. Drain	6.53 gm.	40.6%

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.

Wt. of sample 1.99 gm. 100.0%

Heavy Minerals 1.0 gm. 50.3%

Light Minerals 1.97 gm. 99.0%

Minerals Identified: Heavy Concentrate

No. of Grains Rel. %

Tourmaline	7	1.0
Biotite	1	0.2
garnet	5	1.0
Staurolite	2	0.4
Epidote	1	0.2
Hornblende	2	0.4
Barite	7	1.4
Pyrite	400	78.3
Total Heavy Concentrate	425	100%
Light Concentrate	511	14.0
quartz	700	40.9
Chert	150	8.8
Feldspar	60	3.5
clay minerals	800	46.8

Total 1710 100%

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

Shale, 95-100% gray calc 20-30% Sol. blocky; micaceous, 1-5% buff fine, x-line, dense.

Analyst Filaseta

Date June 24-35

Shape Analysis:

A.%: a.%: C.%

r.%: R.%

Classification Grouping:

Primary Minerals:% Absol. %

Barite clay minerals 46.4

Tourmaline
Biotite
garnet
Staurolite
Epidote
Hornblende
hornblende
quartz 40.6
Feldspar 3.5

Secondary Minerals:%

chert 8.7

Pyrite
Limonite 14.0

Total 1710 100%

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

Shale, 95-100% gray calc 20-30% Sol. blocky; micaceous, 1-5% buff fine, x-line, dense.

Heavies counted from a liquid Moon.

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl...1.5...%)

- | | | | | |
|--|-----------|--------|-----------------|------|
| 1. Sample weight | 20.59 gm. | 100.0% | 2. Wt. of F. P. | 2.33 |
| 3. Wt. after solution, with filter paper | 17.69 gm. | | | |
| 4. Less wt. F. P. (2) | 2.33 gm. | | | |
| 5. Wt. Insol. Residue (3 minus 4) | 15.36 gm. | 74.6% | | |
| 6. Wt. lost by solution (1 minus 5) | 5.23 gm. | 25.4% | | |
| 7. To balance (5 plus 6) | 20.59 gm. | 100.0% | | |

B. Subsidiation:

- | | | |
|---------------------|-----------|--------|
| 1. Original Wt. | 15.36 gm. | 100.0% |
| 2. Cylinder (+1/32) | 8.80 gm. | 7.3% |
| 3. Jar (1/32—1/64) | 2.41 gm. | 15.7% |
| 4. Drain | 4.15 gm. | 27.0% |

Well No. W— 0117

Depth 801 to 804

No. samples used

Analyst Scott

Date 3/29/55

C. Screen Analysis 8.57

SIZE GRAMS %

2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	1.66	
1/4-1/8 mm	7.60	
1/8-1/16	2.26	
Pan	3.05	
Total	8.57	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } Sp. gr. Grade(s) 1.8-1.6 mm.

Wt. of sample 2.24 gm. 100.0%

Heavy Minerals .005 gm. 2%

Light Minerals 2.235 gm. 99.8%

Minerals Identified: Heavy Concentrate

No. of Grains	Rel. %
6	.8
9	1.2
3	.4
17	2.3
2	.3
9	1.2
575	78.2
95	12.9
20	2.7
Total	736 100%

Light Concentrate

quartz	400	23.9
Feldspars	40	2.4
chert	105	6.3
clay minerals	1100	65.9
spherulites	25	1.5
Total	1670	100%

Shape Analysis:

A. %: a. %: C. %

r. %: R. %

Classification Grouping:

Primary Minerals: 92.0%

Absol. %

Amphibole	
Zircon	
garnet	
Tourmaline	
Wolastonite	65.8
clay Minerals	23.8
quartz	
Feldspars	2.4
spherulites	

Secondary Minerals: 8.0%

Barite	1.5
Spinelite	.2
Pyrite	.0
limonite Agg	6.3
Chert	
Total	100%

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

Shale 95-100% gry. Calc 20-30% Sol, blocky micae;
 LS. 1-5% gry fine, xline, dense, pyrite tr.

*Molysanite

* Mineral resembles sphalerite in cleavage, purplish in color,
Highly anisotropic, high index. Possibly Moissanite

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl 12%)

1. Sample weight	20.26 gm.	100.0%	2. Wt. of F. P.	2.25
3. Wt. after solution, with filter paper	15.68 gm.			
4. Less wt. F. P. (2)	2.25 gm.			
5. Wt. Insol. Residue (3 minus 4)	13.43 gm.	66.3%		
6. Wt. lost by solution (1 minus 5)	6.83 gm.	33.7%		
7. To balance (5 plus 6)	20.26 gm.	100.0%		

B. Subsidiation:

1. Original Wt.	13.43 gm.	100.0%
2. Cylinder (+1/32)	2.08 gm.	5.5%
3. Jar (1/32-1/64)	2.24 gm.	1.7%
4. Drain	3.49 gm.	26.0%

Well No. W- 1111
 Depth 804 to 810
 No. samples used 2
 Analyst Scott
 Date 3/29/35

C. Screen Analysis 7.45

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	1.45	19.7
1/4-1/8 mm	1.53	20.8
1/8-1/16	2.08	28.2
Pan	2.32	31.3
Total	7.38	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.

Wt. of sample 20.7 gm. 100.0%
 Heavy Minerals 0.05 gm. 0.2%
 Light Minerals 20.65 gm. 99.8%

Shape Analysis:

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

Minerals Identified:

Heavy Concentrate	No. of Grains	Rel. %
Leucosena	3	0.6
Kamblende	5	1.0
Sphalerite	2	0.6
Biotite	12	2.4
Dolomite	2	0.4
Tremolite	2	0.4
Pyrite	1	0.2
limonite Agg	360	70.8
Total	120	23.6
Total	508	100%

Classification Grouping:

Primary Minerals: 93.7% Absol. %

Kamblende
 Biotite
 Leucosena
 Tremolite
 quartz --- 11.4
 Feldspar --- 1.1
 spherulites --- 0.6
 Clay Minerals 80.6

Light Concentrate

chert	53	6.1
quartz	100	11.4
Feldspar	10	1.1
clay minerals	705	80.8
spherulites	5	0.6
Total	873	100%

Secondary Minerals: 6.3%

Dolomite
 Sphalerite
 Pyrite --- 0.2
 limonite Agg --- 6.1
 chert --- 100%

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

Shale 90-100% rd, grnsh, Calc 20-25% Sol;
 ls 1-10% bf fine, xline, dense; fossiliferous
 Crinoid stems; Pyrite Tr.

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl 1.5%)

- | | | | |
|--|-----------|--------|-----------------------------|
| 1. Sample weight | 20.36 gm. | 100.0% | 2. Wt. of F. P. <u>2.24</u> |
| 3. Wt. after solution, with filter paper | 19.60 gm. | | |
| 4. Less wt. F. P. (2) | 2.24 gm. | | |
| 5. Wt. Insol. Residue (3 minus 4) | 17.36 gm. | 85.3% | |
| 6. Wt. lost by solution (1 minus 5) | 3.00 gm. | 14.7% | |
| 7. To balance (5 plus 6) | 20.36 gm. | 100.0% | |

Well No. W- 0117
 Depth 810 to 815 1/2
 No. samples used 7
 Analyst Scott
 Date 3/22/35

B. Subsidiation:

- | | | |
|---------------------------------|-----------|--------|
| 1. Original Wt. | 17.36 gm. | 100.0% |
| 2. Cylinder (+1/32) <u>8.86</u> | 6.50 gm. | 37.5% |
| 3. Jar (1/32-1/64) <u>2.36</u> | 3.89 gm. | 22.4% |
| 4. Drain <u>6.25</u> | 6.97 gm. | 40.2% |

C. Screen Analysis 6.50

SIZE	GRAMS	%
------	-------	---

2 plus		
2-1 mm	1	
1-1/2 mm	1	
1/2-1/4 mm	5.80	12.3
1/4-1/8 mm	1.22	18.8
1/8-1/16	1.88	28.9
Pan	2.60	40.0
Total	6.50	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } 9.93 ± Sp. gr. Size-Grade(s) 4-1/6 mm.

Analyst Filaseta
 Date June 24-35

Wt. of sample 3.05 gm. 100.0% Shape Analysis:

Heavy Minerals02 gm. 0.7% A. %: a %: C %

Light Minerals 3.03 gm. 99.3% r %: R %

Minerals Identified: Heavy Concentrate No. of Grains Rel. % Classification Grouping: Primary Minerals: 90.3% Absol. %

Barite	10	1.1
Sphalerite	1	0.1
Tourmaline	4	0.4
Zircon	3	0.3
Garnet	2	0.2
Pyrite	460	50.3
Himonite Agg	430	46.9
Leucopane	6	0.7

Tourmaline
 zircon
 garnet
 leucopane
 quartz 31.7
 feldspars 2.0
 claymin. 56.6

Total 911 100%

Light Concentrate		
quartz	560	31.9
Feldspar	36	2.0
clay minerals	1000	57.0
chert	160	9.1

Secondary Minerals: 9.7%
 Chert - - - - - 9.0
 Barite
 sphalerite
 Pyrite - - - - - 0.4
 himonite Agg - - - - - 0.3 100%

Total 1756 100% Total

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

Shale 93-10090 gry. gmsky, Calc 10-20% Sol, Blocky, ls 1-10% bf to gry fine xline dense; flfs, crinoids, brachs, bryozoa.

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl 1.5%)

- | | | | | |
|--|------------------|----------------|-----------------|-------------|
| 1. Sample weight | <u>20.87</u> gm. | 100.0% | 2. Wt. of F. P. | <u>2.19</u> |
| 3. Wt. after solution, with filter paper | <u>16.61</u> gm. | | | |
| 4. Less wt. F. P. (2) | <u>3.19</u> gm. | | | |
| 5. Wt. Insol. Residue (3 minus 4) | <u>14.92</u> gm. | <u>69.1</u> % | | |
| 6. Wt. lost by solution (1 minus 5) | <u>6.45</u> gm. | <u>30.9</u> % | | |
| 7. To balance (5 plus 6) | <u>20.87</u> gm. | <u>100.0</u> % | | |

B. Subsidiation:

- | | | |
|---------------------|------------------|---------------|
| 1. Original Wt. | <u>14.42</u> gm. | 100.0% |
| 2. Cylinder (+1/32) | <u>9.54</u> gm. | <u>66.1</u> % |
| 3. Jar (1/32-1/64) | <u>2.04</u> gm. | <u>14.2</u> % |
| 4. Drain | <u>2.84</u> gm. | <u>19.7</u> % |

Well No. W-0117
 Depth 815 1/2 to 825
 No. samples used 2
 Analyst Scott
 Date 3/29/35

C. Screen Analysis 9.45

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	<u>3.01</u>	<u>32.1</u>
1/4-1/8 mm	<u>1.97</u>	<u>20.9</u>
1/8-1/16	<u>2.30</u>	<u>24.4</u>
Pan	<u>2.19</u>	<u>23.7</u>
Total	<u>9.42</u>	<u>100.0</u>

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } 2.93 ± Sp. gr. Size-Grade(s) 1/8-1/4 mm.

Wt. of sample 2.35 gm. 100.0%
 Heavy Minerals .02 gm. 0.9%
 Light Minerals 2.33 gm. 99.1%

Shape Analysis:

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

Minerals Identified:

Heavy Concentrate	No. of Grains	Rel. %
Leucosane	7	1.0
Barite	37	5.3
Tourmaline	15	2.2
Zircon	3	0.4
garnet	5	0.7
biotite	3	0.4
sphalerite	2	0.3
Hornblende	4	0.6
pyrite	301	44.8
limonite agg	298	44.1
Total	675	100%

Light Concentrate	No. of Grains	Rel. %
quartz	820	37.2
Feldspar	60	2.7
clay min	1175	53.3
chert	150	6.8
Total	2205	100%

Classification Grouping:

Primary Minerals:	Absol. %
Leucosane	
Tourmaline	
Zircon	
garnet	
biotite	
Hornblende	
quartz	36.9
Feldspar	2.7
clay minerals	52.8
Secondary Minerals:	7.6%
pyrite	0.4
sphalerite	
limonite Agg	0.4
chert	6.8
Barite	100%

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

Shale 85-95% drk red, gry, greenish Pale 20-30% Sol, blocky, micae; ls, 5-15% bf to lt gry fine xline dense, fossilifer, crinoid stems, brachs, gastropods, pelocypods.

Analyst Filaretta
 Date June 24-35

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15%)

- | | | | | |
|--|-----------|---------|-----------------|------|
| 1. Sample weight | 20.04 gm. | 100.0% | 2. Wt. of F. P. | 2.30 |
| 3. Wt. after solution, with filter paper | 16.18 gm. | | | |
| 4. Less wt. F. P. (2) | 2.30 gm. | | | |
| 5. Wt. Insol. Residue (3 minus 4) | 13.88 gm. | 69.35% | | |
| 6. Wt. lost by solution (1 minus 5) | 6.16 gm. | 30.75% | | |
| 7. To balance (5 plus 6) | 20.04 gm. | 100.00% | | |

Well No. W- 0.117
 Depth 825 to 829
 No. samples used 1
 Analyst Scott
 Date 3/29/35

C. Screen Analysis 6.19

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	0.90	14.6
1/4-1/8 mm	1.82	29.5
1/8-1/16	2.00	32.4
Pan	1.45	23.5
Total	6.17	100.0

B. Subsidiation:

- | | | |
|---------------------|-----------|--------|
| 1. Original Wt. | 13.88 gm. | 100.0% |
| 2. Cylinder (+1/32) | 6.26 gm. | 45.1% |
| 3. Jar (1/32-1/64) | 2.32 gm. | 16.7% |
| 4. Drain | 5.30 gm. | 38.2% |

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } 2.95 Sp. gr. Size-Grade(s) 1/8-1/16 mm.

Analyst Filasota
 Date June 25-35

Wt. of sample 2.02 gm. 100.0% Shape Analysis:

Heavy Minerals 0.0 gm. 0.5 % A.....%: a.....%: C.....%

Light Minerals 2.01 gm. 99.5 % r.....%: R.....%

Minerals Identified; Heavy Concentrate

Mineral	No. of Grains	Rel. %
Biotite	10	1.9
Amphibole	1	0.2
Worn blende	3	0.6
Topaz	1	0.2
Epidote	2	0.4
Garnet	23	4.3
Tourmaline	23	4.3
Zircon	25	4.7
Pyrite	300	56.6
Limonite Agg	135	25.5
Leucosphaera	6	1.1
Total	530	100%

Classification Grouping:

Primary Minerals: 86.6 %

Absol. %

Secondary Minerals: 13.4 %

Light Concentrate

quartz	220	34.8
Chert	270	13.0
Feldspar	32	1.5
Clay Minerals	1050	50.7

Biotite		
Amphibole		
Worn blende		
Topaz		
Epidote		
Garnet		
Tourmaline		
Zircon		
Leucosphaera		
quartz		34.6
Feldspars		1.5
Clay Minerals		50.5
Pyrite		0.3
Limonite Agg		0.1
Chert		13.0

Total 2.072 100% Total 100%

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

Shale 70-80% H gray calc. 20-30% sil. Blacky
Micac. Sand 10-20% At. maj. qtz 1/4-1/2 prin. sub
1/8-1/16; LS 1-10% qtz fine, xline dense

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl...%)

1. Sample weight	20.96 gm.	100.0%	2. Wt. of F. P.	2.37
3. Wt. after solution, with filter paper	20.41 gm.			
4. Less wt. F. P. (2)	2.37 gm.			
5. Wt. Insol. Residue (3 minus 4)	18.04 gm.	86.1%		
6. Wt. lost by solution (1 minus 5)	2.92 gm.	13.9%		
7. To balance (5 plus 6)	20.96 gm.	100.0%		

Well No. W- 0117
 Depth 822 to 835
 No. samples used 3
 Analyst Scott
 Date 3/29/35

B. Subsidiary:

1. Original Wt.	18.04 gm.	100.0%
2. Cylinder (+1/32)	6.29 gm.	34.9%
3. Jar (1/32-1/64)	2.73 gm.	15.1%
4. Drain	9.02 gm.	50.0%

C. Screen Analysis 6.20

SIZE GRAMS %

2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	2.63	42.7
1/4-1/8 mm	1.08	17.6
1/8-1/16	1.28	20.8
Pan	1.17	18.9
Total	6.16	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } 2.93 Sp. gr. Size-Grade(s) 10-46 mm.

Analyst Filasata
 Date June 25-35

Wt. of sample 2.32 gm. 100.0%

Shape Analysis:

Heavy Minerals .06 gm. 2.6%

A. %: a. %: C. %

Light Minerals 2.26 gm. 97.4%

r. %: R. %

Minerals Identified:

Heavy Concentrate	No. of Grains	Rel. %
Barite	18	1.7
Sphalerite	80	7.5
Garnet	1	0.1
Zircon	3	0.3
Tourmaline	1	0.1
Amphibole	1	0.1
Pyrite	910	85.7
limonite Agg	42	4.0
Leucocene	3	0.5
Total	1061	100%

Classification Grouping:

Primary Minerals: 91.8% Absol. %

garnet
 zircon
 Tourmaline
 Amphibole
 Leucocene
 quartz
 clay minerals
 Feldspars

Light Concentrate

quartz	172	14.7
chert	68	5.8
clay minerals	880	75.2
Feldspars	50	4.3

Secondary Minerals: 8.1%

Barite
 Sphalerite
 Pyrite
 limonite Agg
 chert

Total 1.170 100%

Total 100%

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

Shale 90-100% dr grey blk, calc 8-15% Sol. blocky, Carb;
 LS. 1-10% bt-falt grey xline dense

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl...1.5...%)

1. Sample weight	20.57 gm.	100.0%	2. Wt. of F. P. <u>2.21</u>
3. Wt. after solution, with filter paper	13.06 gm.		
4. Less wt. F. P. (2)	2.21 gm.		
5. Wt. Insol. Residue (3 minus 4)	10.85 gm.	52.8%	
6. Wt. lost by solution (1 minus 5)	9.72 gm.	47.2%	
7. To balance (5 plus 6)	20.57 gm.	100.0%	

B. Subsidiation:

1. Original Wt.	10.85 gm.	100.0%
2. Cylinder (+1/32) <u>8.10</u>	5.97 gm.	53.2%
<u>2.33</u>		
<u>3.80</u>		
3. Jar (1/32—1/64) <u>2.120</u>	1.60 gm.	14.7%
4. Drain	3.18 gm.	32.1%

Well No. W- 0117
 Depth 835 to 842
 No. samples used
 Analyst Seeth
 Date 3/2/65

C. Screen Analysis 5.81

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	1.64	28.4
1/4-1/8 mm	1.13	19.6
1/8-1/16	1.36	23.5
Pan	1.65	28.5
Total	5.78	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } 2.93± Sp. gr. Size-Grade(s) 4-1/16 mm.

Analyst Filipato
 Date June 21-35

Wt. of sample 2.49 gm. 100.0% Shape Analysis:
 Heavy Minerals 0.7 gm. 28% A.....%: a.....%: C.....%
 Light Minerals 2.142 gm. 97.2% r.....%: R.....%

Minerals Identified:	No. of Grains	Rel. %
Heavy Concentrate		
Baite	10	1.8
sphalerite	9	1.6
Pyrite	520	92.7
limonite Hg	22	3.9
Total	561	100%
Light Concentrate		
quartz	207	17.0
chert	762	13.3
Feldspar	43	3.5
clays	810	66.2
Total	1222	100%

Classification Grouping:	Absol. %
Primary Minerals: <u>84.4%</u>	
quartz	16.5
Feldspar	3.4
clays	64.5
Secondary Minerals: <u>15.6%</u>	
Baite	2.6
sphalerite	0.1
Pyrite	
limonite Hg	
chert	12.9
Total	100%

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

Shale 90-100% Hg, Calc. 30-40% Sol. blocky micac,
LS-1-10% bf fine xline dense; fos/tr. crinoid
stems; brachsfrag,

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl.....1.5%)

1. Sample weight	29.90 gm.	100.0%	2. Wt. of F. P.	3.5
3. Wt. after solution, with filter paper	9.36 gm.			
4. Less wt. F. P. (2)	2.35 gm.			
5. Wt. Insol. Residue (3 minus 4)	7.01 gm.	23.4%		
6. Wt. lost by solution (1 minus 5)	22.89 gm.	76.6%		
7. To balance (5 plus 6)	29.90 gm.	100.0%		

B. Subsidiary:

1. Original Wt.	7.01 gm.	100.0%
2. Cylinder (+1/32)	6.03 gm.	86.0%
3. Jar (1/32-1/64)	.29 gm.	4.1%
4. Drain	.69 gm.	9.9%

Well No. W- 0117
 Depth 842 to 847
 No. samples used 1
 Analyst Scott
 Date 3/29/35

C. Screen Analysis 6.07

SIZE	GRAMS	%
2 plus		
2-1 mm	1	
1-1/2 mm	1	
1/2-1/4 mm	2.97	49.0
1/4-1/8 mm	1.69	27.8
1/8-1/16	1.00	16.5
Pan	.41	6.7
Total	6.07	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } 2.93± Sp. gr. Size-Grade(s) 1/4-1/6 mm.

Analyst Filaseta
 Date June 25-35

Wt. of sample 2.61 gm. 100.0% Shape Analysis:

Heavy Minerals .19 gm. 7.3% A.....%: a.....%: C.....%
 Light Minerals 2.42 gm. 92.7% r.....%: R.....%

Minerals Identified;	No. of Grains	Rel. %	Classification Grouping:	Absol. %
Heavy Concentrate			Primary Minerals: <u>85.1%</u>	
Sphalerite	2	6.5	quartz	20.1
Barite	7	17	Feldspar	1.7
Pyrite	360	87.6	clays	63.3
limonite Agg	42	10.2		
Total	411	100%		
Light Concentrate			Secondary Minerals: <u>14.9%</u>	
quartz	315	21.7	Barite	0.4
clay	120	8.3	Sphalerite	6.4
Feldspar	56	1.8	Pyrite	0.7
clays	990	68.2	limonite Agg	0.7
Total	1451	100%	clay	7.7

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

L3. 80-90% bt. med. x-lim. saccharoidal, shale 10-15%
dk gray to blk carb; thin/laminated, pyrite tr. qtz frag
A-a 1-5%

DEEP WELL STUDY

MECHANICAL ANALYSIS

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

1. Sample weight 20.90 gm. 100.0%: 2. Wt. of F. P. 2.27
3. Wt. after solution, with filter paper 16.04 gm.
4. Less wt. F. P. (2) 2.27 gm.
5. Wt. Insol. Residue (3 minus 4) 13.77 gm. 65.9 %
6. Wt. lost by solution (1 minus 5) 7.13 gm. 34.1 %
7. To balance (5 plus 6) 20.90 gm. 100.0 %

Well No. W— 0117

Depth 847 to 851

No. samples used.....

Analyst Scott

Date 3/29/35

B. Subsidiary:

1. Original Wt. 11.40 gm. 100.0%
2. Cylinder (+1/32) 2.15 9.25 gm. 67.2 %
3. Jar (1/32—1/64) 3.48 1.56 gm. 11.3 %
4. Drain 1.92 2.96 gm. 21.5 %

C. Screen Analysis 9.09

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	<u>4.64</u>	<u>51.2</u>
1/4-1/8 mm	<u>1.66</u>	<u>18.4</u>
1/8-1/16	<u>1.23</u>	<u>13.6</u>
Pan	<u>1.52</u>	<u>16.8</u>
Total	<u>9.05</u>	<u>100.0</u>

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } 2.92± Sp. gr. Size-Grade(s) 1/4-1/6 mm.

Analyst Filaseta

Date June 25-35

Wt. of sample 2.88 gm. 100.0% Shape Analysis:

Heavy Minerals 0.2 gm. 0.7 % A.....%: a.....%: C.....%

Light Minerals 2.86 gm. 99.3 % r.....%: R.....%

Minerals Identified: Heavy Concentrate No. of Grains Rel. % Classification Grouping: Primary Minerals: 96.1 % Absol. %

Sphalerite	8	2.3
Barite	2	0.6
Pyrite	315	92.4
Limonite Agg	16	4.7

quartz 3.2

clays 91.7

Feldspars 1.2

Total 341 100%

Light Concentrate	No. of Grains	Rel. %
quartz	32	3.2
Feldspars	12	1.2
chert	32	3.2
clays	920	92.4

Secondary Minerals: 3.9 %

Barite

Sphalerite

Pyrite

Limonite Agg. 0.7

chert 3.2 100%

Total 996 100% Total Revised Lithologic Description (from descriptive log and laboratory data).

Shale 90-100% H gvt calc so 30% sol. blocky mica c

LS 1-10% bt fine, xline dense.

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl...15...%)

1. Sample weight	20.68 gm.	100.0%	2. Wt. of F. P.	2.30
3. Wt. after solution, with filter paper	20.25 gm.			
4. Less wt. F. P. (2)	2.30 gm.			
5. Wt. Insol. Residue (3 minus 4)	17.95 gm.	86.6%		
6. Wt. lost by solution (1 minus 5)	2.73 gm.	13.2%		
7. To balance (5 plus 6)	20.68 gm.	100.0%		

Well No. W— 0117

Depth 851 to 853

No. samples used 1

Analyst Scot

Date 3/29/35

C. Screen Analysis 8.79

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	3.27	38.0
1/4-1/8 mm	1.61	18.7
1/8-1/16	1.44	16.8
Pan	2.28	26.5
Total	8.60	100.0

B. Subsidiation:

1. Original Wt.	17.95 gm.	100.0%
2. Cylinder (+1/32)	1.21	
	8.89 gm.	49.5%
	2.32	
	5.32	
3. Jar (1/32—1/64)	2.97 gm.	
	2.35	
4. Drain	6.09 gm.	33.9%

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. }
 Bromoform } 2.98 Sp. gr. Size-Grade(s) 1/4-1/6 mm.

Analyst Filasota

Date June

Wt. of sample 3.00 gm. 100.0% Shape Analysis:

Heavy Minerals .02 gm. 0.7% A. %: a %: C %

Light Minerals 2.98 gm. 99.3% r %: R %

Minerals Identified:

Heavy Concentrate	No. of Grains	Rel. %
Droptide		0.5%
Barite	12	0.2
Zircon	3	0.5
Garnet	9	1.6
Epidote	5	0.9
Titanite	1	0.2
Hornblende	1	0.2
Rutile	1	0.2
Tourmaline	2	0.4
Pyrite	430	77.7
Total monite Agg.	85	16.1
	553	100%

Classification Grouping:

Primary Minerals: 94.8%

Absol. %

Lpuchana	
diopside	
zircon	
garnet	
Epidote	
Titanite	
Hornblende	
Rutile	
Tourmaline	
quartz	2.4
Feldspar	0.5
clays	91.9

Secondary Minerals: 5.2%

Barite	
Calcit	4.6
Pyrite	0.5
Limmonite Agg.	0.1

Light Concentrate	No. of Grains	Rel. %
quartz	21	2.4
Chert	40	4.6
Feldspars	4	0.5
clays	800	92.5
Total	865	100%

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

Shale 97-100% olive green, Calc 10-15% 5.1, smooth massive; LS 1-3% bf, fine, xline dense.

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15%)

1. Sample weight	20.47 gm.	100.0%	2. Wt. of F. P.	2.34
3. Wt. after solution, with filter paper	16.62 gm.			
4. Less wt. F. P. (2)	2.94 gm.			
5. Wt. Insol. Residue (3 minus 4)	14.38 gm.	69.8%		
6. Wt. lost by solution (1 minus 5)	6.19 gm.	30.2%		
7. To balance (5 plus 6)	20.47 gm.	100.0%		

Well No. W- 0117
 Depth 855 to 868
 No. samples used 3
 Analyst Scott
 Date 3/29/35

B. Subsidiation:

1. Original Wt.	14.38 gm.	100.0%
2. Cylinder (+1/32)	4.91 gm.	34.2%
3. Jar (1/32-1/64)	2.16 gm.	15.0%
4. Drain	7.31 gm.	50.8%

C. Screen Analysis 4.87

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	2.51	52.8
1/4-1/8 mm	.74	15.6
1/8-1/16	.61	12.8
Pan	.89	18.8
Total	4.75	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } 2.933 Sp. gr. Size-Grade(s) 1/4-1/16 mm.

Analyst F. L. ...
 Date June 25-35

Wt. of sample 1.30 gm. 100.0% Shape Analysis:

Heavy Minerals 0.10 gm. 0.8% A. %: a. %: C. %
 Light Minerals 99.2% r. %: R. %:

Minerals Identified:
 Heavy Concentrate

Minerals Identified:	No. of Grains	Rel. %
Zircon	1	0.3
Barite	4	1.0
Hornblende	1	0.3
Opaline Silica	1	0.3
Pyrite	320	83.7
Limonite Agg	55	14.4
Total	382	100%

Classification Grouping:
 Primary Minerals: 93.5% Absol. %

Zircon
 Hornblende
 Opaline Silica
 quartz --- 2.9
 clays --- 90.0
 Feldspars --- 0.6

Light Concentrate

quartz	35	2.9
chert	70	5.9
clays	1080	90.6
Feldspars	17	0.6
Total	1192	100%

Secondary Minerals: 6.5%

Barite
 Pyrite
 Limonite Agg
 chert --- 5.8 100%

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

Shale 90-95% gray green calc. 50-30% Sol
smooth firm blocky; 15-10% grit to bf,
fine xline dense.

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl... 1.5...%)

1. Sample weight	20.51 gm.	100.0%	2. Wt. of F. P.	2.24
3. Wt. after solution, with filter paper	16.58 gm.			
4. Less wt. F. P. (2)	2.24 gm.			
5. Wt. Insol. Residue (3 minus 4)	14.34 gm.	70.0%		
6. Wt. lost by solution (1 minus 5)	6.17 gm.	30.0%		
7. To balance (5 plus 6)	20.51 gm.	100.0%		

Well No. W- 2117
 Depth 868 to 879
 No. samples used 3
 Analyst Scott
 Date 3/29/35

B. Subsidiary:

1. Original Wt.	14.34 gm.	100.0%
2. Cylinder (+1/32)	12.91 gm.	70.8%
3. Jar (1/32-1/64)	1.65 gm.	11.5%
4. Drain	2.54 gm.	17.7%

C. Screen Analysis 10.11

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	3.66	36.7
1/4-1/8 mm	1.98	19.8
1/8-1/16	1.79	17.9
Pan	3.05	30.6
Total	9.98	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. }
 Bromoform } 1.93± Sp. gr. Size-Grade(s) 1/4 - 1/2 mm.
 Tetrabromethane }

Analyst Powers
 Date 25/6/35

Wt. of sample 3.20 gm. 100.0% Shape Analysis:

Heavy Minerals 0.2 gm. 0.6% A.....%: a.....%: C.....%
 Light Minerals 3.18 gm. 99.4% r.....%: R.....%

Minerals Identified:	No. of Grains	Rel. %	Classification Grouping:	Absol. %
Heavy Concentrate			Primary Minerals: 99.4%	
Hornblende		0.5	Hornblende	
Tourmaline			Tourmaline	
			Shale	89.3
			Quartz	9.4
Limonite		1.0	Feldspars	0.5
Pyrite		97.5	Muscovite	0.2

Total 100%

Light Concentrate			Secondary Minerals: 0.6%	
shale frags.	77	89.8	Limonite	
Quartz	82	9.5	Pyrite	0.6
*Feldspar	7	0.5		
Muscovite	2	0.2		

Total 863 100% Total 100%

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

Sh. 65 Calcar. 30%, lt. gray, sand. 5%, few frags. d.f. grn.
 Sh. chips of ls., few crinoid stems.

x Feldspar. abraded and cleavage fragments; microcline, albite
and thin-banded plagioclase.

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl... 1.5...%)

- | | | | | |
|--|-----------|--------|-----------------|------|
| 1. Sample weight | 20.89 gm. | 100.0% | 2. Wt. of F. P. | 2.33 |
| 3. Wt. after solution, with filter paper | 18.55 gm. | | | |
| 4. Less wt. F. P. (2) | 2.33 gm. | | | |
| 5. Wt. Insol. Residue (3 minus 4) | 16.22 gm. | 77.7% | | |
| 6. Wt. lost by solution (1 minus 5) | 4.67 gm. | 22.3% | | |
| 7. To balance (5 plus 6) | 20.89 gm. | 100.0% | | |

Well No. W— 0117
 Depth 294 to 211
 No. samples used 7
 Analyst Scott
 Date 3/29/35

C. Screen Analysis 8.2

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	1.90	23.3
1/4-1/8 mm	2.01	24.7
1/8-1/16	1.99	24.4
Pan	2.26	27.6
Total	8.16	100.0

B. Subsidiary:

- | | | |
|-------------------------------|-----------|--------|
| 1. Original Wt. | 16.23 gm. | 100.0% |
| 2. Cylinder (+1/32) | 10.56 | |
| 2.30 | 8.26 gm. | 50.9% |
| 4.64 | | |
| 3. Jar (1/32—1/64) | 2.34 gm. | 14.4% |
| 2.30 | | |
| 4. Drain | 5.62 gm. | 34.7% |

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. }
 Bromoform } 2.93 Sp. gr. Size-Grade(s) 15-1/16 mm.

Wt. of sample 3.75 gm. 100.0%

Heavy Minerals 0.2 gm. 0.5%

Light Minerals 3.73 gm. 99.5%

Shape Analysis:

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

Minerals Identified:
 Heavy Concentrate

No. of Grains	Rel. %	Classification Grouping:
1	0.2	Primary Minerals: 98.6% Epidote Moissanite quartz Clays Feldspars
1	0.2	
4	0.7	
540	92.9	
35	6.0	

Absol. %

Total 581 100%

Light Concentrate

35	3.1
10	0.9
1080	95.6
5	0.4

Secondary Minerals: 1.4%

Barite
 Pyrite
 Limonite Agg
 Chert 0.9 100%

Total 1130 100% Total

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

Shale 96-10070 1/4 gray calc 10-20% sil. blocky,
 Micac: L.S. 1-4% 9% fine silt dense.

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl...15...%)

- | | | | | |
|--|-----------|--------|-----------------|------|
| 1. Sample weight | 20.81 gm. | 100.0% | 2. Wt. of F. P. | 2.26 |
| 3. Wt. after solution, with filter paper | 18.01 gm. | | | |
| 4. Less wt. F. P. (2) | 2.26 gm. | | | |
| 5. Wt. Insol. Residue (3 minus 4) | 15.75 gm. | 75.7% | | |
| 6. Wt. lost by solution (1 minus 5) | 5.06 gm. | 24.3% | | |
| 7. To balance (5 plus 6) | 20.81 gm. | 100.0% | | |

Well No. W— 0117
 Depth 911 to 920
 No. samples used 2
 Analyst Scott
 Date 3/29/45

C. Screen Analysis 3.76

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	.81	21.5
1/4-1/8 mm	.57	15.2
1/8-1/16	.89	23.7
Pan	1.49	39.4
Total	3.76	100.0

B. Subsidiary:

- | | | |
|-------------------------------|----------|--------|
| 1. Original Wt. | 5.75 gm. | 100.0% |
| 2. Cylinder (+1/32) | 3.73 gm. | 64.9% |
| 3. Jar (1/32-1/64) | 2.77 gm. | 48.2% |
| 4. Drain | 9.25 gm. | 161.7% |

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. }
 Bromoform } 2.93 ± Sp. gr. Size-Grade(s) 4-1/2 mm.

Analyst Powers
 Date

- | | | |
|--------------------------|----------|--------|
| Wt. of sample | 1.37 gm. | 100.0% |
| Heavy Minerals | .04 gm. | 2.9% |
| Light Minerals | 1.33 gm. | 97.1% |

Shape Analysis:

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

Minerals Identified:	No. of Grains	Rel. %
Heavy Concentrate		
Garnet		.0
Zircon (clear)		.0
Titanite		.0
Pyrite		100.0

Classification Grouping:	Absol. %
Primary Minerals: 97.1%	
Garnet	
Zircon (clear)	
Titanite	
Shale	57.9
Quartz	34.2
Muscovite	4.1
Feldspars	0.9

Total 100%

Light Concentrate	760	59.7
Shale	448	35.2
Quartz	53	4.2
Muscovite	12	0.9
Feldspars		

Secondary Minerals: 2.9%
 Pyrite

Total 1273 100% Total 100%

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

Sh 60%, calcar. 25%, sily. 15%, lt gry, carbonaceous material, resembles coal, few crinoid stems & brach. spines, Pyrite abundant

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl, 15%)

1. Sample weight	20.47 gm.	100.0%	2. Wt. of F. P.	2.28
3. Wt. after solution, with filter paper	19.42 gm.			
4. Less wt. F. P. (2)	2.28 gm.			
5. Wt. Insol. Residue (3 minus 4)	17.14 gm.	83.7%		
6. Wt. lost by solution (1 minus 5)	3.33 gm.	16.3%		
7. To balance (5 plus 6)	20.47 gm.	100.0%		

Well No. W- 0117
 Depth 920 to 931 1/2
 No. samples used 3
 Analyst Scott
 Date 5/20/35

C. Screen Analysis 5.66

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	72	13.0
1/4-1/8 mm	1.16	20.9
1/8-1/16	1.61	29.0
Pan	2.06	37.1
Total	5.55	100.0

B. Subsidiary:

1. Original Wt.	17.14 gm.	100.0%
2. Cylinder (+1/32)	5.68 gm.	33.1%
3. Jar (1/32-1/64)	2.88 gm.	16.8%
4. Drain	8.58 gm.	50.1%

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. }
 Bromoform } 2.93 Sp. gr. Size-Grade(s) 1/4-1/6 mm.

Analyst Filaseta
 Date June-25-35

Wt. of sample 2.67 gm. 100.0% Shape Analysis:

Heavy Minerals .03 gm. 1.1% A. %: a %: C %
 Light Minerals .989 gm. 98.9% r %: R %

Minerals Identified: No. of Grains Rel. % Classification Grouping: Absol. %
 Heavy Concentrate Primary Minerals: 93.5%

Barite	3	1.0
Pyrite	290	94.1
Limonite Agg	15	4.9

quartz - 20.9
 clays - 69.9
 Feldspars - 3.7

Total	308	100%
Light Concentrate		
quartz	270	21.1
clays	70	5.5
Feldspars	905	70.7
	35	2.7

Secondary Minerals: 6.5%
 Barite
 Pyrite
 Limonite Agg
 chert - 6.5 100%

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

Shale grey calc 10-20% Sol; silt content 20-30%

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl...15...%)

1. Sample weight	<u>20.87</u> gm.	100.0%	2. Wt. of F. P. <u>2.32</u>
3. Wt. after solution, with filter paper	<u>18.26</u> gm.		
4. Less wt. F. P. (2)	<u>2.32</u> gm.		
5. Wt. Insol. Residue (3 minus 4)	<u>16.44</u> gm.	<u>78.8</u> %	
6. Wt. lost by solution (1 minus 5)	<u>4.43</u> gm.	<u>21.2</u> %	
7. To balance (5 plus 6)	<u>20.87</u> gm.	<u>100.0</u> %	

Well No. W— 0117
 Depth 931 1/2 to 940
 No. samples used 2
 Analyst Scott
 Date 3/29/35

C. Screen Analysis 7.75

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	<u>2.00</u>	<u>26.0</u>
1/4-1/8 mm	<u>1.92</u>	<u>24.9</u>
1/8-1/16	<u>2.18</u>	<u>28.3</u>
Pan	<u>1.60</u>	<u>20.8</u>
Total	<u>7.70</u>	<u>100.0</u>

B. Subsidiary:

1. Original Wt.	<u>16.44</u> gm.	100.0%
2. Cylinder (+1/32) <u>10.03</u>	<u>7.84</u> gm.	<u>47.7</u> %
3. Jar (1/32-1/64) <u>2.19</u>	<u>2.59</u> gm.	<u>15.7</u> %
4. Drain <u>4.89</u>	<u>6.02</u> gm.	<u>36.6</u> %

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. }
 Bromoform } 2.93± Sp. gr. Size-Grade(s) 1/4 - 1/16 mm.

Analyst Powers
 Date

Wt. of sample 3.85 gm. 100.0% Shape Analysis:
(Tube broken - sample possibly contaminated)
 Heavy Minerals01 gm. 0.3 % A.....%: a.....%: C.....%
 Light Minerals 3.84 gm. 99.7 % r.....%: R.....%

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

<u>Titanite</u>			<u>Titanite</u>	<u>99.0</u>
<u>Pyrite</u>			<u>shale</u>	<u>1.8</u>
			<u>Quartz</u>	<u>0.5</u>
			<u>Feldspar</u>	<u>0.4</u>
			<u>Muscovite</u>	

Total 100%

Light Concentrate		
<u>shale</u>	<u>1190</u>	<u>97.3</u>
<u>Quartz</u>	<u>22</u>	<u>1.8</u>
<u>Feldspar</u>	<u>6</u>	<u>0.5</u>
<u>Muscovite</u>	<u>5</u>	<u>0.4</u>
Total	<u>1223</u>	<u>100%</u>

Secondary Minerals:

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

Sh. 79%, calcar. 21%, dk gry to nearly blk, pyrite abundant.

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl...%)

1. Sample weight 20.32 gm. 100.0%: 2. Wt. of F. P. 2.21
3. Wt. after solution, with filter paper 15.46 gm.
4. Less wt. F. P. (2) 2.21 gm.
5. Wt. Insol. Residue (3 minus 4) 13.25 gm. 65.2%
6. Wt. lost by solution (1 minus 5) 7.07 gm. 34.8%
7. To balance (5 plus 6) 20.32 gm. 100.0%

Well No. W— 0117

Depth 940 to 947

No. samples used 2

Analyst Scott

Date 3/29/35

C. Screen Analysis 6.92

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	<u>2.52</u>	<u>37.0</u>
1/4-1/8 mm	<u>1.30</u>	<u>19.1</u>
1/8-1/16	<u>1.60</u>	<u>23.5</u>
Pan	<u>1.39</u>	<u>20.4</u>
Total	<u>6.81</u>	<u>100.0</u>

B. Subsidiation:

1. Original Wt. 13.25 gm. 100.0%
2. Cylinder (+1/32) 9.10 6.99 gm. 53.1%
3. Jar (1/32-1/64) 2.11 3.96 gm. 30.2%
4. Drain 2.35 4.65 gm. 35.1%

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. } 2.93 Sp. gr. Size-Grade(s) 1/4 - 1/16 mm.
 Bromoform }

Analyst Powers

Date

Wt. of sample 2.93 gm. 100.0% Shape Analysis:

Heavy Minerals01 gm. 0.3% A. %: a %: C %

Light Minerals 2.92 gm. 99.7% r %: R %

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

Primary Minerals: 99.7%
Shale - - - - - 98.5
Quartz - - - - - 1.2

Pyrite - 100.0

Total 100%

Light Concentrate
Shale - 99.0 98.8
Quartz - 1.2 1.2

Secondary Minerals: 0.3%
Pyrite

Total 9.02 100% Total 100%

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

Sh. 65%, Calcar. 35%, lt. gry., few frags crinoids & brachs,
pyrite abundant.

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl) 15 %

- | | | | |
|--|------------------|----------------|-----------------------------|
| 1. Sample weight | <u>20.91</u> gm. | 100.0% | 2. Wt. of F. P. <u>2.21</u> |
| 3. Wt. after solution, with filter paper | <u>17.77</u> gm. | | |
| 4. Less wt. F. P. (2) | <u>2.21</u> gm. | | |
| 5. Wt. Insol. Residue (3 minus 4) | <u>15.56</u> gm. | <u>74.4</u> % | |
| 6. Wt. lost by solution (1 minus 5) | <u>5.35</u> gm. | <u>25.6</u> % | |
| 7. To balance (5 plus 6) | <u>20.91</u> gm. | <u>100.0</u> % | |

Well No. W— 0117
 Depth 947 to 964
 No. samples used
 Analyst Scott
 Date 3/29/65

C. Screen Analysis 8.40

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	<u>2.86</u>	<u>34.1</u>
1/4-1/8 mm	<u>1.95</u>	<u>23.2</u>
1/8-1/16	<u>2.11</u>	<u>25.1</u>
Pan	<u>1.48</u>	<u>17.6</u>
Total	<u>8.40</u>	<u>100.0</u>

B. Subsidiary:

- | | | |
|----------------------------------|------------------|---------------|
| 1. Original Wt. | <u>15.56</u> gm. | 100.0% |
| 2. Cylinder (+1/32) <u>10.69</u> | <u>8.91</u> gm. | <u>57.1</u> % |
| 3. Jar (1/32-1/64) <u>4.47</u> | <u>2.15</u> gm. | <u>13.8</u> % |
| 4. Drain <u>2.32</u> | <u>5.00</u> gm. | <u>32.1</u> % |

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. } 2.93± Sp. gr.
 Bromoform- }
 Tetrachromethane

Size-Grade(s) 1/4-1/16 mm.

Analyst Powers
 Date

Wt. of sample 3.86 gm. 100.0% Shape Analysis:

Heavy Minerals 1.0 gm. 26 % A. %: a %: C %
 Light Minerals 2.76 gm. 74 % r %: R %

Minerals Identified;	No. of Grains	Rel. %	Classification Grouping:	Absol. %
Heavy Concentrate			Primary Minerals: <u>6.09</u> %	
			Shale - - -	<u>40.8</u>
			Quartz - - -	<u>19.8</u>
			Muscovite -	<u>0.3</u>

Pyrite - 16.1 %

Total 100%

Light Concentrate	No. of Grains	Rel. %
Shale	<u>610</u>	<u>41.9</u>
Quartz	<u>290</u>	<u>20.3</u>
Pyrite	<u>545</u>	<u>37.5</u>
Muscovite	<u>0</u>	<u>0.3</u>
Total	<u>1455</u>	<u>100</u>

Secondary Minerals: 39.1 %
Pyrite (heavy light) -

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

Sh. 74%, calcar. 26%, dk gry, folios, thinly laminated, carbonaceous, pyrite very abundant

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15.....%)

- | | | | |
|--|------------------|--------|-----------------------------|
| 1. Sample weight | <u>22.89</u> gm. | 100.0% | 2. Wt. of F. P. <u>2.93</u> |
| 3. Wt. after solution, with filter paper | <u>20.32</u> gm. | | |
| 4. Less wt. F. P. (2) | <u>2.33</u> gm. | | |
| 5. Wt. Insol. Residue (3 minus 4) | <u>17.99</u> gm. | 78.5% | |
| 6. Wt. lost by solution (1 minus 5) | <u>4.90</u> gm. | 21.5% | |
| 7. To balance (5 plus 6) | <u>22.89</u> gm. | 100.0% | |

B. Subsidiation:

- | | | |
|-------------------------------|------------------|--------|
| 1. Original Wt. | <u>17.99</u> gm. | 100.0% |
| 2. Cylinder (+1/32) | <u>16.68</u> gm. | 93.7% |
| 3. Jar (1/32--1/64) | <u>.39</u> gm. | 2.2% |
| 4. Drain | <u>.92</u> gm. | 5.1% |

Well No. W— 0417
 Depth 964 to 967
 No. samples used 1
 Analyst Scott
 Date 3/29/35

C. Screen Analysis 16.66

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	<u>23.34</u>	20.1
1/4-1/8 mm	<u>5.25</u>	31.5
1/8-1/16	<u>7.15</u>	42.9
Pan	<u>.91</u>	5.4
Total	<u>16.64</u>	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. }
 Bromoform } Sp. gr. Size-Grade(s) 48-1/16 mm.

Analyst Filaspita
 Date June 26-35

Wt. of sample 3.38 gm. 100.0% Shape Analysis:

Heavy Minerals gm. 6.5 % A. %: a %: C %
 Light Minerals gm. 3.16 % r %: R %.

Minerals Identified:	No. of Grains	Rel. %
Heavy Concentrate		
Zircon	<u>17</u>	1.7
Baillita	<u>28</u>	2.9
Tourmalina	<u>17</u>	1.7
Garnet	<u>6</u>	0.6
Hornblenda	<u>2</u>	0.2
Sphalerite	<u>13</u>	1.3
Pyrite	<u>870</u>	88.7
Limonite Agg	<u>17</u>	1.7
Biotite	<u>2</u>	0.2
Leucopane	<u>70</u>	1.0
Total	<u>982</u>	100%

Classification Grouping:	Absol. %
Primary Minerals: <u>89.3</u> %	
Zircon	0.1
Tourmalina	0.1
Garnet	0.1
Hornblenda	0.1
Biotite	0.1
Leucopane	0.1
quartz	76.5
clays	3.7
Feldspars	9.8

Light Concentrate	No. of Grains	Rel. %
quartz	<u>1620</u>	80.8
Chert	<u>96</u>	4.8
clays	<u>78</u>	3.9
Feldspars	<u>210</u>	10.5
Total	<u>2004</u>	100%

Secondary Minerals:	Rel. %
Barite	0.2
Sphalerite	5.8
Pyrite	0.1
Limonite Agg	0.1
Chert	4.5
Total	10.7

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

SS. 60-70% dk gray, fine 1/8-1/16 Mal grade, prin sub 1/2-1/2 Agg; S/S. 10-20%; shale 10-20%; Mica abundant. 30% sub - 20-90

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl...%)

1. Sample weight	20.83 gm.	100.0%	2. Wt. of F. P.	25
3. Wt. after solution, with filter paper	18.13 gm.			
4. Less wt. F. P. (2)	2.35 gm.			
5. Wt. Insol. Residue (3 minus 4)	15.78 gm.	75.9%		
6. Wt. lost by solution (1 minus 5)	5.05 gm.	24.3%		
7. To balance (5 plus 6)	20.83 gm.	100.0%		

Well No. W- 0117

Depth 967 to 976

No. samples used 2

Analyst Scott

Date 3/29/35

B. Subsidiation:

1. Original Wt.	157 gm.	100.0%
2. Cylinder (+1/32)	7.27 gm.	
	2.07 gm.	33.0%
	448	
3. Jar (1/32-1/64)	2.21 gm.	
	2.21 gm.	1.4%
4. Drain	8.31 gm.	52.6%

C. Screen Analysis 5.0

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	1.05	21.0
1/4-1/8 mm	1.01	20.2
1/8-1/16	1.41	28.3
Pan	1.52	30.5
Total	4.99	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. }
 Bromoform } 93 ± Sp. gr. Size- 14-1/16 mm.
 Tetrabrometh.

Analyst Powers

Date

Wt. of sample 24 gm. 100.0% Shape Analysis:

Heavy Minerals 0.07 gm. 2.9% A. %: a. %: C. %

Light Minerals 2.44 gm. 97.1% r. %: R. %

Minerals Identified: Heavy Concentrate No. of Grains Rel. % Classification Grouping: Primary Minerals: 97.1% Absol. %

Zircon (clear)		0
Pyrite		100.0

Zircon (clear)		
Shale		81.8
Quartz		14.1
Muscovite		0.8
Feldspars		0.4

Total 100%

Light Concentrate

Shale	960	84.3
Quartz	165	14.5
Muscovite	9	0.8
Feldspars	4	0.4

Secondary Minerals: 2.9%

Pyrite

Total 1138 100% Total 100%

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

Sp. 76%, calcar. 24%, grey, silty, 5%, pyrite abundant

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl...1.5...%)

- | | | | | |
|--|-----------|--------|-----------------|------|
| 1. Sample weight | 20.07 gm. | 100.0% | 2. Wt. of F. P. | 2.31 |
| 3. Wt. after solution, with filter paper | 16.90 gm. | | | |
| 4. Less wt. F. P. (2) | 2.31 gm. | | | |
| 5. Wt. Insol. Residue (3 minus 4) | 14.59 gm. | 72.7% | | |
| 6. Wt. lost by solution (1 minus 5) | 5.48 gm. | 27.3% | | |
| 7. To balance (5 plus 6) | 20.07 gm. | 100.0% | | |

Well No. W— 0117

Depth 976 to 979 1/2

No. samples used 2

Analyst Scott

Date 3/29/35

C. Screen Analysis 7.93

SIZE GRAMS %

2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	2.90	37.0
1/4-1/8 mm	1.76	22.4
1/8-1/16	1.62	20.6
Pan	1.57	20.0
Total	7.85	100.0

B. Subsidiary:

- | | | |
|---------------------|-----------|--------|
| 1. Original Wt. | 14.59 gm. | 100.0% |
| 2. Cylinder (+1/32) | 7.97 gm. | 54.6% |
| 3. Jar (1/32—1/64) | 1.74 gm. | 11.9% |
| 4. Drain | 4.88 gm. | 33.5% |

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } 2.93± Sp. gr. Size-Grade(s) 1/4-1/16 mm.

Analyst Fildsota

Date June 28-35

Wt. of sample 3.4 gm. 100.0% Shape Analysis:

Heavy Minerals 0.3 gm. 0.9% A. %: a %: C %

Light Minerals 3.28 gm. 99.1% r %: R %

Minerals Identified: Heavy Concentrate No. of Grains Rel. % Classification Grouping: Primary Minerals: 94.9% Absol. %

Pyrite	250	69.0	Tourmaline	
Limonite Agg	110	30.7	epidote	
Tourmaline	1	0.3	quartz	2.1
Barite	1	0.3	Feldspars	2.1
Epidote	1	0.3	clay	90.7
Total	363	100%		

Light Concentrate		Secondary Minerals: 5.1%
Chert	4.00	4.2
clay	10.50	91.6
Feldspars	3.4	2.1
quartz	2.4	2.1
Total	19.46	100%

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

Shale buff grey to rd grey. Calc 25-30% Sol.
Very mica c. silt 20-30% fissil

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl...15.....%)

1. Sample weight	<u>20.37</u> gm.	100.0%	2. Wt. of F. P. <u>2.30</u>
3. Wt. after solution, with filter paper	<u>17.15</u> gm.		
4. Less wt. F. P. (2)	<u>2.30</u> gm.		
5. Wt. Insol. Residue (3 minus 4)	<u>14.85</u> gm.	<u>73.0%</u>	
6. Wt. lost by solution (1 minus 5)	<u>5.52</u> gm.	<u>27.0%</u>	
7. To balance (5 plus 6)	<u>20.37</u> gm.	<u>100.0%</u>	

Well No. W— 0117
 Depth 979½ to 985
 No. samples used 1
 Analyst Scott
 Date 3/22/45

C. Screen Analysis 6.99

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-½ mm		
½-¼ mm	<u>2.15</u>	<u>30.8</u>
¼-⅛ mm	<u>1.60</u>	<u>22.9</u>
⅛-1/16	<u>1.78</u>	<u>25.5</u>
Pan	<u>1.45</u>	<u>20.8</u>
Total	<u>6.98</u>	<u>100.0</u>

B. Subsidiation:

1. Original Wt.	<u>85</u> gm.	100.0%
2. Cylinder (+1/32) <u>9.29</u>	<u>7.05</u> gm.	<u>47.5%</u>
3. Jar (1/32—1/64) <u>2.24</u>	<u>2.06</u> gm.	<u>15.1%</u>
4. Drain <u>4.30</u>	<u>5.74</u> gm.	<u>38.6%</u>

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. }
 Bromoform } 93± Sp. gr. Size-Grade(s) 4-1/16 mm.

Analyst Powers
 Date

Wt. of sample 3.3 gm. 100.0% Shape Analysis:

Heavy Minerals 0.9 gm. 2.7% A. %: a %: C %
 Light Minerals 3.22 gm. 97.3% r %: R %

Minerals Identified: Heavy Concentrate No. of Grains Rel. % Classification Grouping: Primary Minerals: 97.3% Absol. %

Zircon (clear)
Tourmaline (Brown)
Green

Pyrite

Zircon (clear) -
Tourmaline (Brown)
Green

Quartz
Quartzite
Feldspars
Muscovite
Shale

10.0
 0.9
 0.5
 1.2
 94.9

Total 100%

Light Concentrate

<i>Shale</i>	<u>1020</u>	<u>87.1</u>
<i>Quartz</i>	<u>120</u>	<u>10.3</u>
<i>Quartzite</i>	<u>10</u>	<u>0.9</u>
<i>Feldspars</i>	<u>6</u>	<u>0.5</u>
<i>Muscovite</i>	<u>14</u>	<u>1.2</u>

Secondary Minerals: 2.7%

Pyrite

2.7

Total 1170 100% Total 100%

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

Sh. 73%, calc. 2.7%, silty 5-10%, gry, rather tough,
pyrite abundant.

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl...15.....%)

1. Sample weight 20.72 gm. 100.0%: F. P. 2.32
2. Wt. of
3. Wt. after solution, with filter paper 17.70 gm.
4. Less wt. F. P. (2) 2.32 gm.
5. Wt. Insol. Residue (3 minus 4) 15.48 gm. 74.7%
6. Wt. lost by solution (1 minus 5) 5.24 gm. 25.3%
7. To balance (5 plus 6) 20.72 gm. 100.0%

B. Subsidiation:

1. Original Wt. 15.48 gm. 100.0%
2. Cylinder (+1/32) 11.26 0.95 gm. 57.8%
3. Jar (1/32—1/64) 2.31 4.13 18.1 gm. 11.1%
4. Drain 2.32 4.72 gm. 30.5%

Well No. W- 0117

Depth 985 to 994 1/2

No. samples used 3

Analyst Scott

Date 3/29/35

C. Screen Analysis 8.97

SIZE GRAMS %

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	<u>4.27</u>	<u>47.9</u>
1/4-1/8 mm	<u>1.92</u>	<u>21.4</u>
1/8-1/16	<u>1.02</u>	<u>11.3</u>
Pan	<u>1.11</u>	<u>12.4</u>
Total	<u>8.93</u>	<u>100.0</u>

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. } 2.93 ± Sp. gr. Size-Grade(s) 4-1/16 mm.

Bromoform }

Analyst Powers

Date

Wt. of sample 3.2 gm. 100.0% Shape Analysis:

Heavy Minerals .05 gm. 1.5% A.....%: a.....%: C.....%

Light Minerals 3.24 gm. 98.5% r.....%: R.....%

Minerals Identified;	No. of Grains	Rel. %	Classification Grouping:	Absol. %
Heavy Concentrate			Primary Minerals: <u>98.5</u> %	
<i>Tourmaline</i>			<i>Tourmaline</i>	
<i>Brown</i>			<i>Brown</i>	
<i>Green</i>			<i>Green</i>	
<i>Pyrite</i>			<i>Shale</i>	<u>30.2</u>
			<i>Quartz</i>	<u>15.5</u>
			<i>Quartzite</i>	<u>2.0</u>
			<i>Muscovite</i>	<u>0.8</u>
Total		100%	Secondary Minerals: <u>1.5</u> %	
Light Concentrate			<i>Pyrite</i>	<u>1.5</u>
<i>Shale</i>	<u>650</u>	<u>81.5</u>		
<i>Quartz</i>	<u>125</u>	<u>15.7</u>		
<i>Quartzite</i>	<u>16</u>	<u>2.0</u>		
<i>Muscovite</i>	<u>6</u>	<u>0.8</u>		
Total	<u>797</u>	100%	Total	100%

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

Sh. 9% Calc. 2.5%; lt. g. sh. gry.; sty. 15.5%; pyrite abundant.

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl. 2.0%)

1. Sample weight	20.95 gm.	100.0%	2. Wt. of F. P.	2.22
3. Wt. after solution, with filter paper	17.79 gm.			
4. Less wt. F. P. (2)	2.22 gm.			
5. Wt. Insol. Residue (3 minus 4)	15.57 gm.	74.3%		
6. Wt. lost by solution (1 minus 5)	5.38 gm.	25.7%		
7. To balance (5 plus 6)	20.95 gm.	100.0%		

Well No. W— 0117
 Depth 994 1/2 to 1020
 No. samples used 2
 Analyst Scott
 Date 3/29/35

C. Screen Analysis 5.41

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	1.32	
1/4-1/8 mm	1.11	
1/8-1/16	1.84	
Pan	1.14	
Total	5.41	100.0

B. Subsidiary:

1. Original Wt.	15.57 gm.	100.0%
2. Cylinder (+1/32)	5.35 gm.	34.4%
3. Jar (1/32—1/64)	3.42 gm.	15.5%
4. Drain	7.80 gm.	50.1%

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. }
 Bromoform: } 93+ Sp. gr. Size-Grade(s) 1/4-1/16 mm.

Analyst Powers
 Date

Tetrabromethane

Wt. of sample	284 gm.	100.0%	Shape Analysis:
Heavy Minerals	0.25 gm.	0.1%	A. %: a %: C %:
Light Minerals	283.75 gm.	99.9%	r %: R %:

Minerals Identified:	No. of Grains	Rel. %	Classification Grouping:	Absol. %
Heavy Concentrate			Primary Minerals: 99.1%	
Tourmaline Brown Green			Tourmaline Brown Green	
Zircon Clear			Zircon Shale quartz quartzite Feldspars Muscovite	72.8 22.8 0.9 0.5 1.1
Pyrite		100.0		
Total		100%		

Light Concentrate			Secondary Minerals: 0.9%	
Shale quartz quartzite Feldspars Muscovite	730 225 9 6 11	74.5 28.0 0.9 0.5 1.1	Pyrite	0.9
Total	990	100%	Total	100%

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

Sh. 74%, calcar. 26%, k. 2%; few frags. of small stones; pyrite abundant.

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl $\frac{1}{5}$ %)

1. Sample weight	19.49 gm.	100.0%	2. Wt. of F. P.	2.34
3. Wt. after solution, with filter paper	15.55 gm.			
4. Less wt. F. P. (2)	2.34 gm.			
5. Wt. Insol. Residue (3 minus 4)	13.21 gm.	67.8%		
6. Wt. lost by solution (1 minus 5)	6.28 gm.	32.2%		
7. To balance (5 plus 6)	19.49 gm.	100.0%		

Well No. W- 011
 Depth 1029 to 1033
 No. samples used 1
 Analyst Scott
 Date 3/29/35

C. Screen Analysis 6.50

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	0.22	4.8
1/4-1/8 mm	1.38	29.2
1/8-1/16	1.17	18.9
Pan	0.63	10.2
Total	6.20	100.0

B. Subsidiation:

1. Original Wt.	13.21 gm.	100.0%
2. Cylinder (+1/32)	6.48 gm.	49.0%
3. Jar (1/32-1/64)	1.70 gm.	12.9%
4. Drain	5.03 gm.	38.1%

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. }
~~Bromoform~~ } 93# Sp. gr. Size-Grade(s) 1/4 - 1/16 mm.
 Tetrahydrof. }

Analyst Powers
 Date

Wt. of sample 2.51 gm. 100.0% Shape Analysis:

Heavy Minerals 0.20 gm. 8.0% A. %: a. %: C. %
 Light Minerals 2.31 gm. 92.0% r. %: R. %

Minerals Identified: Heavy Concentrate No. of Grains Rel. % Classification Grouping: Primary Minerals: 92.0% Absol. %

Tourmaline (brown)

Pyrite

Tourmaline (brown) 0.7
 Shale 89.4
 Quartz 2.4
 Feldspars 0.9

Total 100%

Light Concentrate

Shale
 Quartz
 Feldspars

890	97.2
24	2.6
2	

Secondary Minerals: 8.0%

Pyrite

Total 100% Total 100%

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

Sh 68%, calcar. 32%; soft, frags of ls with crinoid stems.
 pyrite abundant

DEEP WELL STUDY

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 | 16.87 gm. | | | |
| 4. Less wt. F. P. (2) | 2.52 gm. | | | |
| 5. Wt. Insol. Residue (3 minus 4) | 14.35 gm. | 71.4% | | |
| 6. Wt. lost by solution (1 minus 5) | 5.77 gm. | 28.6% | | |
| 7. To balance (5 plus 6) | 20.1 gm. | 100.0% | | |

B. Subsidiary:

- | | | |
|---------------------|-----------|--------|
| 1. Original Wt. | 14.35 gm. | 100.0% |
| 2. Cylinder (+1/32) | 8.04 gm. | 56.1% |
| 3. Jar (1/32-1/64) | 2.73 gm. | 19.0% |
| 4. Drain | 3.58 gm. | 24.9% |

Well No. W- 0117
 Depth 1033 to 1050
 No. samples used 4
 Analyst Pennel
 Date 4-30-35

C. Screen Analysis 7.90

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	74.00	51.1
1/4-1/8 mm	1.00	12.8
1/8-1/16	1.21	15.4
Pan	1.62	20.7
Total	7.83	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } Sp. gr. Size-Grade(s) 1/4-1/16 mm.

Analyst Filasota
 Date Jan 28-35

Wt. of sample 2.16 gm. 100.0%

Shape Analysis:

Heavy Minerals 0.11 gm. 5.1 %

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

Light Minerals 2.05 gm. 94.9 %

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

Minerals Identified; Heavy Concentrate

	No. of Grains	Rel. %
Hornblende	1	0.1
Barite	9	1.3
Garnet	1	0.1
Zircon	1	0.1
Epidote	1	0.1
Pyrite	585	85.9
Liminito Agg	83	12.1
Leucosane	2	0.3
Total	683	100%

Classification Grouping:

Primary Minerals: 90.51 %

Absol. %

Hornblende
 Garnet
 Zircon
 Epidote
 Leucosane
 Quartz
 Feldspars
 Clays

42.7
 8.13
 42.7

Light Concentrate

Quartz	800	44.9
Chart	80	4.5
Feldspars	100	5.8
Clays	800	44.9

Secondary Minerals: 9.3 %

Barite
 Pyrite
 Liminito Agg
 Chart

4.4
 0.16
 4.3

Total 1780 100% Total

100%

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

Sh 85-95% grey calc. 15-25% Sol micac; LS 5-15%
bt to lt grey, fine xline dense

DEEP WELL STUDY

MECHANICAL ANALYSIS

- A. Acid treatment (HCl $\frac{15}{100}$ %)
1. Sample weight 20.10 gm. 100.0%: F. P. _____
 2. Wt. after solution, with filter paper 17.46 gm.
 3. Less wt. F. P. (2) 2.29 gm.
 4. Wt. Insol. Residue (3 minus 4) 15.17 gm. 75.5%
 5. Wt. lost by solution (1 minus 5) 4.93 gm. 24.5%
 6. To balance (5 plus 6) 20.10 gm. 100%

- B. Subsidiation:
1. Original Wt. 15.17 gm. 100.0%
 2. Cylinder (+1/32) 13.56 11.25 gm. 74.2%
2.31
 3. Jar (1/32-1/64) 3.94 1.62 gm. 10.7%
2.32
 4. Drain 2.30 gm. 15.1%

Well No. W- 0117
 Depth 1050 to 1058
 No. samples used 1
 Analyst Pennel
 Date 4/30/35

C. Screen Analysis 11.05

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	<u>5.13</u>	<u>46.5</u>
1/4-1/8 mm	<u>2.90</u>	<u>26.9</u>
1/8-1/16	<u>2.20</u>	<u>20.0</u>
Pan	<u>1.28</u>	<u>11.6</u>
Total	<u>11.01</u>	<u>100.0</u>

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

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

Analyst Filasetta
 Date June 28-35

Wt. of sample 2.18 gm. 100.0% Shape Analysis:
 Heavy Minerals 0.7 gm. 3.2% A. %: a. %: C. %
 Light Minerals 2.11 gm. 96.8% r %: R %.

Minerals Identified:	No. of Grains	Rel. %	Classification Grouping:	Absol. %
Heavy Concentrate			Primary Minerals: <u>86.4%</u>	
Anhydrite	1	0.1	Tourmaline	
Tourmaline	1	0.1	Hornblende	
Barite	2	0.2	Biotite	
Hornblende	1	0.1	Leucophaea	
Biotite	1	0.1	quartz	<u>34.4</u>
Pyrite	500	55.7	clays	<u>48.2</u>
Limonite Agg.	390	43.5	Feldspar	<u>3.8</u>
Leucophaea	2	0.2		
Total	<u>898</u>	<u>100%</u>		
Light Concentrate			Secondary Minerals: <u>13.6%</u>	
quartz	500	36.6	Barite	
chart	150	10.7	pyrite	<u>1.8</u>
clays	700	49.8	anhydrite	
Feldspar	55	3.9	Limonite Agg.	<u>1.4</u>
Total	<u>1405</u>	<u>100%</u>	chart	<u>10.4</u>

Revised Lithologic Description (from descriptive log and laboratory data).
Shale 95-10090 mottled red gray, br. Calc. 15-20%
Sol. Micaceous L.S. 1-5% fine silt dense; fossiliferous
Orinoid stems

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15%)

- | | | | | |
|--|-----------|--------|-----------------|--|
| 1. Sample weight | 20.89 gm. | 100.0% | 2. Wt. of F. P. | |
| 3. Wt. after solution, with filter paper | 19.00 gm. | | | |
| 4. Less wt. F. P. (2) | 0.5 gm. | | | |
| 5. Wt. Insol. Residue (3 minus 4) | 16.95 gm. | 81.2% | | |
| 6. Wt. lost by solution (1 minus 5) | 3.94 gm. | 18.8% | | |
| 7. To balance (5 plus 6) | 20.89 gm. | 100% | | |

B. Subsidiation:

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

Well No. W- 0117
 Depth 1058 to 1059
 No. samples used
 Analyst Pennel
 Date 4/30/35

C. Screen Analysis 16.23

SIZE	GRAMS	%
2 plus		
2-1 mm	3.53	22.4
1-1/2 mm	3.46	22.0
1/2-1/4 mm	2.87	18.2
1/4-1/8 mm	2.19	13.9
1/8-1/16	2.00	12.7
Pan	1.70	10.8
Total	15.75	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

~~Acet. Tetrabr.~~
~~Bromoform~~
~~Tetrabrometh~~

Size-Grade(s) 7/6 mm.

Analyst Powers
 Date

- | | | |
|----------------|----------|--------|
| Wt. of sample | 2.16 gm. | 100.0% |
| Heavy Minerals | 0.5 gm. | % |
| Light Minerals | 97.5 % | |

Shape Analysis:

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

Minerals Identified;	No. of Grains	Rel. %
Heavy Concentrate		
Zircon		
Tourmaline		
Green		0.0
Brown		0.0
Barite		0.0
Pyrite		
Total		100%

Classification Grouping:
 Primary Minerals: 97.7 %

	Absol. %
Zircon clear	
Tourmaline Green	
Tourmaline Brown	
Barite	
Shale	81.5
Quartz	14.3
Muscovite	0.4
Feldspars	0.8
Chert	0.7

Light Concentrate	No. of Grains	Rel. %
Shale	740	83.5
Quartz	160	14.6
Muscovite		0.4
Feldspars		0.8
Chert		0.7

Secondary Minerals: 2.3 %
 Pyrite 2.3

Total 1127 100% Total 100%

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

sh. 81% calcar. 19% dk. gry. to blk. ls. frags. pyrite abundant.

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15%)

1. Sample weight 20.56 gm. 100.0% : F. P. _____
 2. Wt. of _____
 3. Wt. after solution, with filter paper 14.92 gm.
 4. Less wt. F. P. (2) 2.28 gm.
 5. Wt. Insol. Residue (3 minus 4) 12.64 gm. _____ %
 6. Wt. lost by solution (1 minus 5) 7.92 gm. _____ %
 7. To balance (5 plus 6) 0.56 gm. 100 %

B. Subsidiation:

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

Well No. W— 0117
 Depth 1059 to 1062
 No. samples used 1
 Analyst Pennel
 Date 11/30/35

C. Screen Analysis 12.35

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	<u>8.58</u>	<u>70.6</u>
1/4-1/8 mm	<u>1.47</u>	<u>12.1</u>
1/8-1/16	<u>1.34</u>	<u>11.0</u>
Pan	<u>.76</u>	<u>6.3</u>
Total	<u>12.15</u>	<u>100.0</u>

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

~~Acet-Tetrabr. Bromoform~~ } 93± Sp. gr. Size-Grade(s) 1/4 - 1/16 mm.

Tourmaline

- Wt. of sample 2.87 gm. 100.0%
 Heavy Minerals50 gm. 17.4 %
 Light Minerals 2.37 gm. 82.6 %

Shape Analysis:

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

Minerals Identified:
 Heavy Concentrate

No. of Grains Rel. %

Classification Grouping:

Primary Minerals: _____ %

Absol. %

Zircon clear
Tourmaline Brown

Zircon clear
Tourmaline Brown
Shale
Quartz
Quartzite
Feldspars
Chert
Muscovite

60.3
14.9
2.7
0.4
3.4
0.9

Pyrite

100.

Total 100%

Light Concentrate

<u>Shale</u>	<u>1100</u>	<u>72.0</u>
<u>Quartz</u>	<u>270</u>	<u>18.0</u>
<u>Quartzite</u>	<u>49</u>	<u>3.2</u>
<u>Feldspars</u>	<u>7</u>	<u>0.5</u>
<u>Chert</u>	<u>66</u>	<u>4.1</u>
<u>Muscovite</u>	<u>17</u>	<u>1.1</u>

Secondary Minerals: 17.4 %

Pyrite

17.4

Total 100% Total

100%

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

Sp. 61% calcar. 39% ; gry. ls. to dk. few ls. frags with
crinoid stems, pyrite abundant.

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl...15%)

1. Sample weight 20.15 gm. 100.0% : F. P. _____
2. Wt. of _____
3. Wt. after solution, with filter paper 14.82 gm.
4. Less wt. F. P. (2) 2.28 gm.
5. Wt. Insol. Residue (3 minus 4) 2.54 gm. 62.3%
6. Wt. lost by solution (1 minus 5) 7.61 gm. 37.1%
7. To balance (5 plus 6) 0.15 gm. 100.0%

B. Subsidiation:

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

Well No. W— 0117

Depth 1066 to 1076

No. samples used 3

Analyst Penne

Date 4/30/35

C. Screen Analysis 12.45

SIZE GRAMS %

2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	<u>15.97</u>	<u>48.8</u>
1/4-1/8 mm	<u>2.05</u>	<u>16.9</u>
1/8-1/16	<u>3.40</u>	<u>27.7</u>
Pan	<u>.83</u>	<u>6.8</u>
Total	<u>12.25</u>	<u>100.0</u>

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. }
Bromoform } Sp. gr. Size-Grade(s) 18-1/16 mm.

Analyst Filasetta

Date June 29-35

Wt. of sample 3.39 gm. 100.0%

Heavy Minerals50 gm. 14.7%

Light Minerals 2.89 gm. 86.3%

Shape Analysis:

A. % : a. % : C. %

r % : R %

Minerals Identified;	No. of Grains	Rel. %
Heavy Concentrate		
Baite	<u>16</u>	<u>11</u>
Anhydrite	<u>1</u>	<u>0.1</u>
Tourmaline	<u>3</u>	<u>0.2</u>
Biotite	<u>1</u>	<u>0.1</u>
Garnet	<u>1</u>	<u>0.1</u>
Sphalerite	<u>1</u>	<u>0.1</u>
Pyrite	<u>810</u>	<u>57.2</u>
Lim. Agg.	<u>581</u>	<u>41.0</u>
Louvaran	<u>2</u>	<u>0.1</u>
Total	<u>1416</u>	<u>100%</u>

Classification Grouping:
Primary Minerals: 76.5 % Absol. %

Tourmaline 12
Biotite
Garnet
Louvaran
quartz 63.5
Clays 9.5
Feldspar 13.5

Light Concentrate	No. of Grains	Rel. %
quartz	<u>1000</u>	<u>74.3</u>
chert	<u>140</u>	<u>10.4</u>
clay	<u>150</u>	<u>11.2</u>
Feldspar	<u>35</u>	<u>4.1</u>
Total	<u>1345</u>	<u>100%</u>

Secondary Minerals: 23.5 %

Baite 0.2
Anhydrite
Sphalerite 8.4
Pyrite 6.0
Lim. Agg. 6.0
chert 8.9 100%

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

Shale 95-10090 gray-red calc 3-5% soft friable micaceous
Thin seams of carb. material; LS 1-5% brown fine
slime dense, washed sample contains sand A to C Maj 9d
1/2-1/4) privin sub 1/4-1/8; fossils crinoids brach frags.

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl 75%)

- | | | | | |
|--|-----------|--------|-----------------|--|
| 1. Sample weight | 20.83 gm. | 100.0% | 2. Wt. of F. P. | |
| 3. Wt. after solution, with filter paper | 20.03 gm. | | | |
| 4. Less wt. F. P. (2) | 2.36 gm. | | | |
| 5. Wt. Insol. Residue (3 minus 4) | 7.67 gm. | 84.6% | | |
| 6. Wt. lost by solution (1 minus 5) | 3.16 gm. | 15.4% | | |
| 7. To balance (5 plus 6) | 20.83 gm. | 100% | | |

B. Subsidiation:

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

C. Screen Analysis 17.61

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm	7.54	3.1
1/2-1/4 mm	5.4	3.1
1/4-1/8 mm	3.82	28.1
1/8-1/16	11.15	64.4
Pan	1.21	7.3
Total	17.32	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

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

Analyst F. Lasota

Date June 28-35

Wt. of sample 3.38 gm. 100.0%

Shape Analysis:

Heavy Minerals .05 gm. 1.5%

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

Light Minerals 3.33 gm. 98.5%

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

Minerals Identified:
Heavy Concentrate

	No. of Grains	Rel. %
Bautila	10	0.9
Biotite	4	0.3
Tourmaline	40	3.4
Zircon	10	0.9
Korund	1	0.1
Sphalerite	1	0.1
Pyrite	525	44.7
Limonite Agg	510	43.4
Leucosand	73	6.2
Total	1174	100%

Classification Grouping:

Primary Minerals: 95.2%

Absol. %

Biotite
Tourmaline
Zircon
Korund
Leucosand
quartz
Feldspars
clays

89.7
2.5
3.0

Light Concentrate

quartz	1800	91.0
chert	70	3.5
clays	60	3.0
Feldspars	50	2.5

Secondary Minerals: 4.8%

Bautila
Sphalerite
Pyrite
Limonite Agg
chert

0.7
0.5
3.5
100%

Total 1980 100% Total
Revised Lithologic Description (from descriptive log and laboratory data).

Sandstone fine grained 15% Sol, Major grd 1/8-1/16, prin sub 1/4-1/8; Sandstone somewhat shaley

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15%)

- | | | | | |
|--|------------------|---------------|-------------------------|--|
| 1. Sample weight | <u>20.44</u> gm. | 100.0% | 2. Wt. of F. P. | |
| 3. Wt. after solution, with filter paper | <u>14.05</u> gm. | | | |
| 4. Less wt. F. P. (2) | <u>2.53</u> gm. | | | |
| 5. Wt. Insol. Residue (3 minus 4) | <u>1.52</u> gm. | <u>56.7</u> % | | |
| 6. Wt. lost by solution (1 minus 5) | <u>8.92</u> gm. | <u>43.3</u> % | | |
| 7. To balance (5 plus 6) | <u>20.44</u> gm. | <u>100</u> % | | |

B. Subsidiation:

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

Well No. W-- 0117
 Depth 1082 to 1085
 No. samples used 1
 Analyst Pannel
 Date 4/30/35

C. Screen Analysis 11.33

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm	<u>1.77</u>	<u>6.9</u>
1/2-1/4 mm	<u>.43</u>	<u>3.9</u>
1/4-1/8 mm	<u>1.61</u>	<u>14.5</u>
1/8-1/16	<u>6.11</u>	<u>55.0</u>
Pan	<u>2.18</u>	<u>19.7</u>
Total	<u>11.10</u>	<u>100.0</u>

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } 193± Sp. gr. Size-Grade(s) 1/8-1/16 mm.

Analyst Powers
 Date

- Tetrabrometh. }
 Wt. of sample 3.56 gm. 100.0%
 Heavy Minerals09 gm. 2.5 %
 Light Minerals 3.47 gm. 97.5 %

Shape Analysis:

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

Minerals Identified;	No. of Grains	Rel. %	
Heavy Concentrate			
Tourmaline	1	0.5	
Brown	1	0.1	
Blue	1	0.1	
Green	2	0.7	
Barite	1	0.1	
Zircon	21	1.9	
Clear	1	0.1	
zoned			
Pyrite	1165	99.1	
Total	1197	100%	

Classification Grouping: Absol. %

Primary Minerals: 7.6 %
 Tourmaline
 Brown
 Blue
 Green
 Barite
 Zircon
 Clear
 zoned
 Quartz 90.5
 Chert 2.7
 Feldspars 1.4
 Muscovite 0.4
 Shale 2.6
 Secondary Minerals: 2.4 %
 Pyrite 2.4

Light Concentrate	No. of Grains	Rel. %	
Quartz	1298	92.7	
Chert	39	2.8	
Feldspars	20	1.4	
Muscovite	6	0.4	
Shale	33	2.7	
Total	1401	100%	

Total 1401 100% **Total** 100%

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

S/s., lt. gry., calc. 44%, soapy, few frags. brown sh., washed
sample contains sand, maj. grd. = 1/2 to 3/4, prim. sub. grd. =
1/2 - 1/4.

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl 7.5%)

1. Sample weight	21.31 gm.	100.0%	2. Wt. of F. P.	
3. Wt. after solution, with filter paper	20.44 gm.			
4. Less wt. F. P. (2)	2.32 gm.			
5. Wt. Insol. Residue (3 minus 4)	18.12 gm.	85.1%		
6. Wt. lost by solution (1 minus 5)	3.19 gm.	14.9%		
7. To balance (5 plus 6)	21.31 gm.	100.0%		

B. Subsidiation:

1. Original Wt.	18.12 gm.	100.0%
2. Cylinder (+1/32)	9.28 gm.	51.2%
3. Jar (1/32-1/64)	3.22 gm.	17.8%
4. Drain	5.62 gm.	31.0%

Well No. W-0117
 Depth 10.85 to 10.97
 No. samples used 3
 Analyst Pennei
 Date 4/30/35

C. Screen Analysis 9.18

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	2.39	26.1
1/4-1/8 mm	2.00	21.9
1/8-1/16	2.45	26.8
Pan	2.31	25.2
Total	9.15	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

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

Analyst Filasoeta
 Date June 29-35

Wt. of sample 2.45 gm. 100.0%

Shape Analysis:

Heavy Minerals .04 gm. 1.6%

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

Light Minerals 0.84%

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

Minerals Identified:

Classification Grouping:

Absol. %

Heavy Concentrate	No. of Grains	Rel. %
Tourmaline	5	0.6
zircon	4	0.5
garnet	1	0.1
Pyrite	780	93.8
Limonite Agg	42	5.0
Leucocane	4	0.5
Total	836	100%

Primary Minerals: 89.1%

Tourmaline	
zircon	
garnet	
Leucocane	
quartz	11.9
Feldspars	1.7
clays	76.5

Light Concentrate	No. of Grains	Rel. %
quartz	125	12.1
chart	98	9.5
clays	790	76.7
Feldspars	18	1.7
Total	1031	100%

Secondary Minerals:	Absol. %
Pyrite	1.5
Limonite Agg	
Chart	9.4

Total 1031 100% Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).
shale 95-100% dk grey, 10-15% sil nearly black, firm micac; 1.5-5% dk grey fine x limp dense; a few frags of red'h brown, green sh.

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl 75%)

- | | | | | |
|--|-----------|--------|-----------------|--|
| 1. Sample weight | 20.82 gm. | 100.0% | 2. Wt. of F. P. | |
| 3. Wt. after solution, with filter paper | 16.25 gm. | | | |
| 4. Less wt. F. P. (2) | 2.34 gm. | | | |
| 5. Wt. Insol. Residue (3 minus 4) | 13.9 gm. | 66.9% | | |
| 6. Wt. lost by solution (1 minus 5) | 6.9 gm. | 33.1% | | |
| 7. To balance (5 plus 6) | 0.82 gm. | 100% | | |

B. Subsidiation:

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

Well No. W— 0117
 Depth 1097 to 1102
 No. samples used
 Analyst Pennel
 Date 4/30/35

C. Screen Analysis 13.99

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm	<u>2.63</u>	19.6
1/2-1/4 mm	<u>1.42</u>	10.6
1/4-1/8 mm	<u>1.61</u>	12.0
1/8-1/16	<u>6.40</u>	47.7
Pan	<u>1.36</u>	10.1
Total	<u>13.42</u>	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

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

Analyst Filaseta
 Date June 10 35

Wt. of sample 3.90 gm. 100.0% Shape Analysis:

Heavy Minerals .05 gm. 1.3% A.....%: a.....%: C.....%

Light Minerals 3.85 gm. 98.7% r.....%: R.....%

Minerals Identified:

Heavy Concentrate	No. of Grains	Rel. %
Zircon	23	2.6
Tourmaline	27	3.0
Barite	18	2.0
Hornblende	4	0.4
Rutile	1	0.1
garnet	1	0.1
staurolite	1	0.1
pyrite	710	79.4
Limonite Agg	66	7.3
Leucosane	45	5.0
Total	896	100%

Light Concentrate	No. of Grains	Rel. %
quartz	1600	89.9
chert	79	4.4
feldspars	51	2.9
clays	50	2.8

Classification Grouping:

Primary Minerals: 99.5%

Absol. %

Zircon
 Tourmaline
 Hornblende
 Rutile
 garnet
 staurolite
 Leucosane 0.1
 quartz 88.8
 feldspars 2.9
 clays 2.8

Secondary Minerals: 6.4%

Barite
 chert 4.3
 pyrite 1.0
 Limonite Agg 0.1

Total

1780 100%

Total

100%

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

Slts 95-100% H. gray friable sandy 33% to 50%
 few frags of grn & brown shale; washed sample
 contains sand ATC major gr 1/8-1/16, prin sub 1-1/2

DEEP WELL STUDY

MECHANICAL ANALYSIS

- A. Acid treatment (HCl 15%)
2. Wt. of F. P. _____
- Sample weight 21.21 gm. 100.0%
 - Wt. after solution, with filter paper 18.17 gm.
 - Less wt. F. P. (2) 2.51 gm.
 - Wt. Insol. Residue (3 minus 4) 15.66 gm. 73.8%
 - Wt. lost by solution (1 minus 5) 5.55 gm. 26.2%
 - To balance (5 plus 6) 21.21 gm. 100%

Well No. W- 0117
 Depth 1102 to 1114
 No. samples used 3
 Analyst Pannel
 Date 4/30/35

- B. Subsidiation:
- Original Wt. 15.66 gm. 100.0%
 - Cylinder (+1/32) 12.33 9.99 gm. 63.8%
2.34
3.87
 - Jar (1/32-1/64) 1.42 gm. 9.1%
2.45
 - Drain 4.25 gm. 27.1%

C. Screen Analysis 9.81

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	<u>4.00</u>	<u>40.7</u>
1/4-1/8 mm	<u>2.23</u>	<u>22.8</u>
1/8-1/16	<u>2.48</u>	<u>25.3</u>
Pan	<u>1.10</u>	<u>11.2</u>
Total	9.81	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

~~Acet-Tetrabr.~~
~~Bromoform~~ } 2.93 Sp. gr. Size-Grade(s) 1/2-1/16 mm.

Analyst Powers
 Date _____

- ~~Tourmaline~~
 Wt. of sample 2.48 gm. 100.0% Shape Analysis:
 Heavy Minerals 11 gm. 4.4% A. _____% : a. _____% : C. _____%
 Light Minerals 2.37 gm. 95.6% r. _____% : R. _____%

Minerals Identified;	No. of Grains	Rel. %	Classification Grouping:	Absol. %
Heavy Concentrate			Primary Minerals: <u>95.6%</u>	
<u>Barite</u>			<u>Tourmaline</u>	
<u>Tourmaline</u>			<u>Brown</u>	
<u>Brown</u>		0.0	<u>Green</u>	
<u>Green</u>		0.0	<u>Zircon</u>	
<u>Zircon</u>		0.0	<u>Clear</u>	
<u>Clear</u>		0.0	<u>Quartz</u>	<u>65.3</u>
<u>Pyrite</u>		100.0	<u>Chert</u>	<u>6.6</u>
			<u>Quartzite</u>	<u>1.57</u>
			<u>Feldspar</u>	<u>0.2</u>
			<u>Shale</u>	<u>21.5</u>
			<u>Muscovite</u>	<u>0.4</u>
			<u>Glaucousc.</u>	<u>0.1</u>
			<u>Barite</u>	
Total		100%	Secondary Minerals: <u>4.4%</u>	
Light Concentrate			<u>Pyrite</u>	
<u>Quartz</u>	<u>144</u>	<u>68.2</u>		
<u>Chert</u>	<u>95</u>	<u>6.9</u>		
<u>Quartzite</u>	<u>22</u>	<u>1.6</u>		
<u>Feldspar</u>	<u>3</u>	<u>0.2</u>		
<u>Shale</u>	<u>310</u>	<u>22.5</u>		
<u>Muscovite</u>	<u>9</u>	<u>0.4</u>		
<u>Glaucousc.</u>	<u>1</u>	<u>0.1</u>		
Total	180	100%	Total	100%

Revised Lithologic Description (from descriptive log and laboratory data).
Sp. gry to rdh., calcar. 2.6%, stp (m-t) chiefly 18%, firm,
pyrite abundant, forams. common.

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15%)

1. Sample weight 20.02 gm. 100.0%: F. P. _____
2. Wt. of _____
3. Wt. after solution, with filter paper 16.62 gm.
4. Less wt. F. P. (2) 3.2 gm.
5. Wt. Insol. Residue (3 minus 4) 14.30 gm. 71.4 %
6. Wt. lost by solution (1 minus 5) 5.72 gm. 28.6 %
7. To balance (5 plus 6) 20.02 gm. 100 %

B. Subsidiation:

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

Well No. W— 0117
 Depth 1114 to 1122 1/2
 No. samples used _____
 Analyst Pennel
 Date 4/30/35

C. Screen Analysis 14.05
 SIZE GRAMS %

2 plus		
2-1 mm		
1-1/2 mm	<u>3.29</u>	<u>24.0</u>
1/2-1/4 mm	<u>1.28</u>	<u>9.3</u>
1/4-1/8 mm	<u>1.15</u>	<u>8.4</u>
1/8-1/16	<u>5.92</u>	<u>43.1</u>
Pan	<u>2.09</u>	<u>15.2</u>
Total	<u>13.73</u>	<u>100.0</u>

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. } 2.92± Sp. gr. Size-Grade(s) 1/2-1/16 mm.
 Bromoform }

Analyst Filasota
 Date Jan. 28-35

Wt. of sample 3.62 gm. 100.0%
 Heavy Minerals06 gm. 1.7 %
 Light Minerals 3.56 gm. 98.3 %

Shape Analysis:

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

Minerals Identified:	No. of Grains	Rel. %
Heavy Concentrate		
Leucopane	<u>90</u>	<u>5.3</u>
Tourmaline	<u>23</u>	<u>3.1</u>
Barite	<u>20</u>	<u>1.2</u>
Zircon	<u>37</u>	<u>2.1</u>
Rutile	<u>4</u>	<u>0.2</u>
Chlorite	<u>1</u>	<u>0.1</u>
Biotite	<u>3</u>	<u>0.2</u>
Titanite	<u>1</u>	<u>0.1</u>
Hornblende	<u>1</u>	<u>0.1</u>
Pyrite	<u>1</u>	<u>0.1</u>
Limonite Agg	<u>260</u>	<u>99.6</u>
Total	<u>730</u>	<u>100%</u>
Light Concentrate		
quartz	<u>1500</u>	<u>86.0</u>
chert	<u>120</u>	<u>6.9</u>
clays	<u>100</u>	<u>5.7</u>
Feldspars	<u>25</u>	<u>1.4</u>
Total	<u>1745</u>	<u>100%</u>

Classification Grouping:	Absol. %
Primary Minerals: <u>91.7</u> %	
Leucopane	
Tourmaline	
Zircon	
Rutile	
chlorite	
Biotite	
Titanite	
Hornblende	
quartz	<u>84.6</u>
clays	<u>5.7</u>
Feldspars	<u>1.4</u>
Secondary Minerals: <u>8.3</u> %	
barite	
pyrite	<u>0.8</u>
limonite Agg	<u>0.6</u>
chert	<u>6.9</u>
Total	<u>100%</u>

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

sls + shale 95-100% N. gray, 2890 soft friable micaceous;
Pyrite + iron conc 1-5% washed sample, sand
A-C Maj. grad 1/2-1/16, prin sub 1-1/2

DEEP WELL STUDY

Washed and screened only.

MECHANICAL ANALYSIS

A. Acid treatment (HCl %)

1. Sample weight 20.03 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.%

Well No. W- 0117

Depth 1122 1/2 to 1132 1/2

No. samples used

Analyst Penner

Date 4/30/35

B. Subsidiation:

1. Original Wt. 20.03 gm. 100.0%

2. Cylinder (+1/32) 21.87 19.54 gm. 97.6%

2.33

2.22

3. Jar (1/32-1/64)22 gm. 1.1%

2.00

4. Drain27 gm. 1.3%

C. Screen Analysis 19.53

SIZE GRAMS %

2 plus		
2-1 mm		
1-1/2 mm	<u>4.26</u>	<u>21.8</u>
1/2-1/4 mm	<u>2.91</u>	<u>14.9</u>
1/4-1/8 mm	<u>4.65</u>	<u>23.8</u>
1/8-1/16	<u>6.08</u>	<u>31.7</u>
Pan	<u>1.52</u>	<u>7.8</u>
Total	<u>19.52</u>	<u>100.0</u>

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

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

Analyst Filasetta

Date July 2-35

Wt. of sample 3.93 gm. 100.0% Shape Analysis:

Heavy Minerals 1.11 gm. 28.2 % A.%: a.%: C.%

Light Minerals 2.82 gm. 71.8 % r.%: R.%

Minerals Identified:	No. of Grains	Rel. %	Classification Grouping:	Absol. %
Heavy Concentrate			Primary Minerals: <u>89.0</u> %	
Pyrite	<u>137</u>	<u>14.4</u>	Siderite	<u>22.2</u>
limonite	<u>60</u>	<u>6.3</u>	quartz	<u>55.1</u>
* Siderite	<u>750</u>	<u>79.0</u>	clay minerals	<u>9.8</u>
Barite	<u>3</u>	<u>.3</u>	Feldspars	<u>1.9</u>
Total	<u>950</u>	<u>100%</u>	Secondary Minerals: <u>11.0</u> %	
Light Concentrate			Pyrite	<u>4.1</u>
quartz	<u>960</u>	<u>76.8</u>	limonite	<u>1.8</u>
chert	<u>88</u>	<u>7.0</u>	Barite	<u>.1</u>
clay minerals	<u>170</u>	<u>13.6</u>	Chert	<u>5.0</u>
Feldspars	<u>32</u>	<u>2.6</u>		
Total	<u>250</u>	<u>100%</u>		

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

Slts + shale, U. gray Mon. Calc. friable, micac, sandy pyritic; contains iron conc. - 1-5%. In washed sample Sand A-C Majord 1/8-1/16 - prin sub 1/4-1/8

* Siderite - not affected by acid. Extreme ng- μ e
High interference bands. grains prolific, highly
altered.



DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl. 15%)

- | | | | | |
|--|-----------|--------|-----------------|--|
| 1. Sample weight | 21.00 gm. | 100.0% | 2. Wt. of F. P. | |
| 3. Wt. after solution, with filter paper | 21.06 gm. | | | |
| 4. Less wt. F. P. (2) | 2.29 gm. | | | |
| 5. Wt. Insol. Residue (3 minus 4) | 18.77 gm. | 88.3% | | |
| 6. Wt. lost by solution (1 minus 5) | 2.23 gm. | 11.7% | | |
| 7. To balance (5 plus 6) | 21.00 gm. | 100.0% | | |

B. Subsidiary:

- | | | |
|---------------------|-----------|--------|
| 1. Original Wt. | 18.77 gm. | 100.0% |
| 2. Cylinder (+1/32) | 13.45 gm. | 71.7% |
| 3. Jar (1/32-1/64) | 1.76 gm. | 9.4% |
| 4. Drain | 3.56 gm. | 18.9% |

Well No. W- 0117
 Depth 1132 1/2 to 1141
 No. samples used 2
 Analyst Pennel
 Date 4/30/35

C. Screen Analysis 13.31

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm	96	30.0
1/2-1/4 mm	3.31	25.0
1/4-1/8 mm	2.91	22.0
1/8-1/16	1.88	14.2
Pan	1.16	8.8
Total	13.22	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. }
 Bromoform } Sp. gr. Size-Grade(s) 1/4-1/16 mm.

Wt. of sample 2.98 gm. 100.0%

Heavy Minerals .53 gm. 17.8%

Light Minerals 2.45 gm. 82.2%

Shape Analysis:

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

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

Minerals Identified:
 Heavy Concentrate

	No. of Grains	Rel. %
Sphalerite	7	7
Barite	7	7
Zircon	4	4
Muscovite	1	1
Pyrite	900	90.3
Limonite Agg	75	7.5
Lepidocrocite	3	3
Total	997	100%

Classification Grouping:

Primary Minerals: 73.4 %

Zircon	.1
Muscovite	10
Lepidocrocite	.1
quartz	12.6
clays	60.3
Feldspars	.3

Light Concentrate

quartz	250	15.3
chert	180	11.0
clays	1200	73.3
Feldspars	6	.4

Secondary Minerals: 26.6 %

Sphalerite	.1
Barite	.1
Pyrite	16.1
Limonite Agg	1.3
chert	9.0
Total	100%

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

Shale 95-100%, Md grey 11.7% Calc. friable
Micac, silty, a few frags of rd, gn sh, brown, sh.
Pyrite 1-2%

Analyst Filaso ta
 Date June 29-35

DEEP WELL STUDY

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 | 19.84 gm. | | | |
| 4. Less wt. F. P. (2) | 2.38 gm. | | | |
| 5. Wt. Insol. Residue (3 minus 4) | 17.46 gm. | 86.8 % | | |
| 6. Wt. lost by solution (1 minus 5) | 2.63 gm. | 13.2 % | | |
| 7. To balance (5 plus 6) | 20.09 gm. | 100 % | | |

B. Subsidiation:

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

Well No. W- 117
 Depth 1141 to 1145
 No. samples used 1
 Analyst Pennel
 Date 4/30/35

C. Screen Analysis 17.28

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm	7.87	46.0
1/2-1/4 mm		
1/4-1/8 mm	2.62	15.3
1/8-1/16	5.35	31.2
Pan	1.29	7.5
Total	17.13	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } Sp. gr. Size-Grade(s) 18-116 mm.

Analyst Filasota
 Date June 29-35

Wt. of sample 36.0 gm. 100.0%
 Heavy Minerals .33 gm. 9.2%
 Light Minerals 3.27 gm. 9.1%

Shape Analysis:

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

Minerals Identified; Heavy Concentrate

Mineral	No. of Grains	Rel. %
Tourmaline	25	.8
Barite	21	.7
Zircon	13	.4
Nornblende	1	.0
garnet	3	.1
Rutile	2	.1
chlorite	3	.1
Pyrite	2750	91.4
limonite	150	5.0
Leucopane	43	1.4
Total	3011	100%

Classification Grouping:

Primary Minerals: 83.8%	Absol. %
Tourmaline	.1
Zircon	.0
Nornblende	.0
garnet	.6
Rutile	.0
	.1
Leucopane	72.4
quartz	9.1
clays	2.1
Feldspar	

Light Concentrate

quartz	1200	79.7
chert	120	8.0
clays	150	10.0
Feldspar	35	2.3
Total	1505	100%

Secondary Minerals: 16.2%

chert	8.4
Pyrite	.5
limonite	.1
Barite	.0
chlorite	
Total	100%

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

Shale + siltstone 95-100% gray red 13% soft firm
 soapy; Pyrite 2.3%

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl $\frac{15}{100}$ %)

- | | | | | |
|--|-----------|--------|-----------------|--|
| 1. Sample weight | 20.02 gm. | 100.0% | 2. Wt. of F. P. | |
| 3. Wt. after solution, with filter paper | 20.57 gm. | | | |
| 4. Less wt. F. P. (2) | 25 gm. | | | |
| 5. Wt. Insol. Residue (3 minus 4) | 18.32 gm. | 91.5% | | |
| 6. Wt. lost by solution (1 minus 5) | 1.70 gm. | 8.5% | | |
| 7. To balance (5 plus 6) | 20.02 gm. | 100% | | |

B. Subsidiation:

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

Well No. W- 0117
 Depth 1145 to 1149 1/2
 No. samples used 1
 Analyst Pennel
 Date 4/30/35

C. Screen Analysis 18.14

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm	6.29	35.0
1/2-1/4 mm		
1/4-1/8 mm	6.02	33.7
1/8-1/16	4.91	27.4
Pan	.70	3.9
Total	17.92	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. }
 Bromoform } Sp. gr. Size-Grade(s) 1.8-1/16 mm.

Analyst F. Jasota
 Date July 2-35

Wt. of sample 3.74 gm. 100.0%
 Heavy Minerals .54 gm. 14.5%
 Light Minerals 3.20 gm. 85.5%

Shape Analysis:

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

Minerals Identified:
 Heavy Concentrate

No. of Grains Rel. %

Classification Grouping:

Absol. %

Pyrite	1040	88.5
Leucosphaerite	27	2.3
Limonite	43	3.7
Zircon	18	1.5
Tourmaline	11	1.0
Garnet	6	.5
Barite	27	2.3
Chlorite	9	.8
Total	1174	100%

Primary Minerals: 81.0%

Leucosphaerite	.3
Zircon	.2
Tourmaline	.2
Garnet	.1
Quartz	71.2
Clays	6.4
Feldspars	2.6

Light Concentrate

Quartz	1020	83.3
Clay	75	6.2
Clay	90	7.5
Feldspars	36	3.0
Total	1221	100%

Secondary Minerals: 19.0%

Pyrite	12.9
Limonite	.5
Barite	.3
Chlorite	5.3
Clay	100%

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

Siltstone, 95-100% clay calc. F. 5% sol. Micac, thin sandy
 tan gray rd shaly, silty.

DEEP WELL STUDY

MECHANICAL ANALYSIS

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

1. Sample weight 20.18 gm. 100.0% : F. P. _____
2. Wt. of _____
3. Wt. after solution. with filter paper 20.20 gm.
4. Less wt. F. P. (2) 2.28 gm.
5. Wt. Insol. Residue (3 minus 4) 7.92 gm. 88.9%
6. Wt. lost by solution (1 minus 5) 2.26 gm. 11.1%
7. To balance (5 plus 6) 20.1 gm. 100.0%

B. Subsidiation:

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

Well No. W— 0117

Depth 1149 1/2 to 1154 1/2

No. samples used _____

Analyst Pennel

Date 4/30/35

C. Screen Analysis 17.75

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm	<u>79.69</u>	<u>44.0</u>
1/2-1/4 mm	<u>3.21</u>	<u>18.4</u>
1/4-1/8 mm	<u>3.86</u>	<u>22.2</u>
1/8-1/16	<u>2.09</u>	<u>12.0</u>
Pan	<u>.60</u>	<u>3.4</u>
Total	<u>17.45</u>	<u>100.0</u>

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

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

Analyst F. Laseta

Date July - 35

Wt. of sample 215 gm. 100.0%

Shape Analysis:

Heavy Minerals41 gm. 19.0%

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

Light Minerals 1.74 gm. 81.0%

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

Minerals Identified;	No. of Grains	Rel. %
Heavy Concentrate		
Leucopyne	14	.9
Tourmaline	17	1.1
Zircon	15	1.0
Garnet	4	.3
Barite	65	4.1
Rutile	2	.1
Titanite	1	.1
Pyrite	1875	87.9
Limonite Agg	70	4.5
Total	1563	100%

Classification Grouping:
Primary Minerals: 69.4%

	Absol. %
Leucopyne	.2
Tourmaline	.2
Zircon	.2
Garnet	.6
Rutile	.0
Titanite	.0
quartz	55.2
clays	12.3
Feldspar	1.2

Light Concentrate	No. of Grains	Rel. %
quartz	900	68.1
chert	200	15.2
clays	200	15.2
Feldspar	20	1.5
Total	1320	100%

Secondary Minerals: 30.6%

	Absol. %
Barite	.8
Pyrite	16.6
Limonite Agg	.9
chert	12.3
Total	100%

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

Shale grey calc - 1190 Sol, micac, firm, LS 2-370
bf fine, xline dense, pyrite 1-2%, silty in part,

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15%)

- | | | | | |
|--|-----------|--------|-----------------|--|
| 1. Sample weight | 20.00 gm. | 100.0% | 2. Wt. of F. P. | |
| 3. Wt. after solution, with filter paper | 17.50 gm. | | | |
| 4. Less wt. F. P. (2) | 2.49 gm. | | | |
| 5. Wt. Insol. Residue (3 minus 4) | 5.06 gm. | 75.3% | | |
| 6. Wt. lost by solution (1 minus 5) | 4.94 gm. | 24.7% | | |
| 7. To balance (5 plus 6) | 20.00 gm. | 100.0% | | |

B. Subsidiation:

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

Well No. W- 0117
 Depth 1154 1/2 to 1158
 No. samples used 1
 Analyst Peanel
 Date 4/30/35

C. Screen Analysis 14.81

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm	<u>4.42</u>	<u>30.5</u>
1/2-1/4 mm	<u>2.10</u>	<u>14.5</u>
1/4-1/8 mm	<u>3.56</u>	<u>24.6</u>
1/8-1/16	<u>3.67</u>	<u>25.3</u>
Pan	<u>.74</u>	<u>5.1</u>
Total	<u>14.49</u>	<u>100.0</u>

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

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

Analyst Filasta
 Date July 30 - 35

Wt. of sample 2.86 gm. 100.0%
 Heavy Minerals .43 gm. 15.0 %
 Light Minerals 2.43 gm. 85.0 %

Shape Analysis:

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

Minerals Identified:
 Heavy Concentrate

	No. of Grains	Rel. %
Barite	<u>24</u>	<u>3.7</u>
Tourmaline	<u>14</u>	<u>1.5</u>
Zircon	<u>11</u>	<u>1.2</u>
Garnet	<u>2</u>	<u>.2</u>
Rutile	<u>1</u>	<u>.1</u>
Pyrite	<u>780</u>	<u>85.8</u>
Limonite	<u>50</u>	<u>5.5</u>
Leucophaea	<u>18</u>	<u>2.0</u>
Total	910	100%

Classification Grouping:

Primary Minerals: 76.1 %

Absol. %

Tourmaline	.2
Zircon	.2
Garnet	.0
Rutile	.0
Leucophaea	.3
quartz	65.0
clays	8.3
Feldspar	2.1

Light Concentrate

quartz	<u>1029</u>	<u>76.0</u>
chart	<u>150</u>	<u>11.3</u>
clays	<u>130</u>	<u>9.7</u>
Feldspar	<u>34</u>	<u>2.5</u>
Total	1343	100%

Secondary Minerals: 23.9 %

Barite	13.0
pyrite	1.8
Limonite Agg.	9.6
chart	1.5

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

shale 80-90% mottled grey, red, nearly blk, Micac
firm, in part silty, Calc 24.7%, sol pyrite 2-3%
Sand-10-12% A, Maj grd-1-1/2, prin sub 1/8-1/16

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl. 15%)

1. Sample weight 20.07 gm. 100.0%: F. P. _____
2. Wt. of _____
3. Wt. after solution, with filter paper 18.73 gm.
4. Less wt. F. P. (2) 2.33 gm.
5. Wt. Insol. Residue (3 minus 4) 16.40 gm. 81.7%
6. Wt. lost by solution (1 minus 5) 3.67 gm. 18.3%
7. To balance (5 plus 6) 20.07 gm. 100.0%

B. Subsidiation:

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

Well No. W- 0117

Depth 116.6 to 117.2 ft

No. samples used 2

Analyst Peapel

Date 4/30/35

C. Screen Analysis 15.95

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	<u>78.36</u>	<u>53.4</u>
1/4-1/8 mm	<u>2.91</u>	<u>18.5</u>
1/8-1/16	<u>2.58</u>	<u>16.4</u>
Pan	<u>1.89</u>	<u>11.7</u>
Total	<u>15.69</u>	<u>100.0</u>

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

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

Analyst Filasetta

Date July 2, 35

Wt. of sample 2.63 gm. 100.0%

Shape Analysis:

Heavy Minerals11 gm. 4.2%

A. %: a. %: C. %

Light Minerals 2.52 gm. 95.8%

r %: R %

Minerals Identified:

No. of Grains Rel.

Classification Grouping:

Absol. %

Heavy Concentrate	No. of Grains	Rel.
Zircon	31	2.4%
garnet	67	5.2
Tourmaline	15	1.2
clinozoisite	37	2.9
Barite	1	.1
Rutile	20	1.5
Hornblende	1	.1
limonite Agg	1	.1
Pyrite	365	28.3
Total	750	58.2
	1288	100%

Primary Minerals: 81.8%

Leucophaea	.1
Zircon	.2
garnet	.1
Tourmaline	.1
clinozoisite	.0
Rutile	.0
Hornblende	.0
quartz	53.9
clays	25.2
Feldspars	2.2

Light Concentrate	No. of Grains	Rel.
quartz	750	58.2
chert	205	15.2
clays	350	26.3
Feldspars	31	2.3
Total	1336	100%

Secondary Minerals: 18.2%

Barite	.1
pyrite	2.4
limonite Agg	1.2
chert	14.5
Total	100%

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

Shale 95-100% mottled gray, brown, red, foblk

Calc 18.3% sol. friable in part silty, micac

saapy.

DEEP WELL STUDY

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 | 20.24 gm. | | |
| 4. Less wt. F. P. (2) | 2.33 gm. | | |
| 5. Wt. Insol. Residue (3 minus 4) | 17.91 gm. | 89.2% | |
| 6. Wt. lost by solution (1 minus 5) | 2.2 gm. | 10.8% | |
| 7. To balance (5 plus 6) | 2.1 gm. | 100% | |

Well No. W- 0117
 Depth 1172 1/2 to 1179 1/2
 No. samples used _____
 Analyst Pennel
 Date 4/30/35

C. Screen Analysis 17.83

SIZE	GRAMS	%
2 plus		
7+1 mm	.80	4.6
1-1/2 mm	1.89	5.1
1/2-1/4 mm	1.25	7.2
1/4-1/8 mm	7.07	40.5
1/8-1/16	6.35	36.4
Pan	1.08	6.2
Total	17.44	100.0

B. Subsidiary:

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

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. }
 Bromoform } Sp. gr. Size-Grade(s) 1/2-1/16 mm.

Analyst Filasota
 Date 5/3rd-35

Wt. of sample 2.97 gm. 100.0%

Shape Analysis:

Heavy Minerals08 gm. 2.7%

A. %: a %: C %

Light Minerals 2.89 gm. 97.3%

r %: R %

Minerals Identified:
 Heavy Concentrate

	No. of Grains	Rel. %
Zircon	40	8.5
garnet	20	1.9
Tourmaline	60	5.7
Barite	17	1.6
Rutile	5	.5
Pyrite	620	58.5
limonite Agg	155	14.7
leucospar	91	8.6
Total	1058	100%

Classification Grouping:

Primary Minerals: 91.2%

Absol. %

Zircon	.2
garnet	.1
Tourmaline	.2
Rutile	.0
leucospar	.2
quartz	83.8
chert	4.8
Feldspar	1.9

Light Concentrate

quartz	1050	86.2
chert	85	7.0
clay	60	4.9
Feldspar	23	1.9

Secondary Minerals: 8.8%

Barite	1.6
Pyrite	.4
Limonite Agg	6.8
Chert	

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

Siltstone 70-80% A maj grd 1/4-1/8, Prim Sub 1/16-1/32; Shale 20-25% grey red, firm silty
 Total sample 1190 Sol. pyrite 2-3% Mica 1-2%
 Prim, Muscovite.

DEEP WELL STUDY

MECHANICAL ANALYSIS

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

1. Sample weight	20.10 gm.	100.0%	2. Wt. of F. P.	
3. Wt. after solution, with filter paper	21.30 gm.			
4. Less wt. F. P. (2)	2.03 gm.			
5. Wt. Insol. Residue (3 minus 4)	19.27 gm.	96.9%		
6. Wt. lost by solution (1 minus 5)	.83 gm.	4.1%		
7. To balance (5 plus 6)	20.10 gm.	100%		

Well No. W- 0117
 Depth 179 1/2 to 1189 1/2
 No. samples used
 Analyst Peanel
 Date 8/30/35

B. Subsidiation:

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

C. Screen Analysis 18.95

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	7.76	4.1
1/4-1/8 mm	11.29	60.3
1/8-1/16	6.18	33.1
Pan	.46	2.5
Total	18.69	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

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

Analyst Filasota
 Date July 5-35

Wt. of sample	3.24 gm.	100.0%
Heavy Minerals	.07 gm.	2.2%
Light Minerals	3.17 gm.	97.8%

Shape Analysis:

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

Minerals Identified:

Heavy Concentrate	No. of Grains	Rel. %
Zircon	154	9.5
Tourmaline	68	4.2
Garnet	55	3.4
Rutile	16	1.0
Barite	9	.6
Epidote	1	.1
Pyrite	920	57.0
Limonite	225	14.0
Leucosane	165	10.2
Total	1613	100%

Classification Grouping:

Primary Minerals:	Absol. %
Zircon	.2
Tourmaline	.1
Garnet	.1
Rutile	.0
Epidote	.0
Leucosane	.2
Quartz	
Clays	
Feldspar	
Secondary Minerals:	Absol. %
Pyrite	1.3
Limonite	.3
Chert	.0
Barite	.0
Total	100%

Light Concentrate	No. of Grains	Rel. %
Quartz	990	92.1
Chert	27	2.5
Clays	36	3.3
Feldspar	22	2.1
Total	1075	100%

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

Siltstone shale 95-100% mat + lod red gray + blk
 Calc. Ag. Sol. firm soapy, washed sample contain
 Sand. A to a, maj grd 1/4-1/8, prin sub 1/8-1/16

DEEP WELL STUDY

MECHANICAL ANALYSIS

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

1. Sample weight 20.12 gm. 100.0%: F. P. _____
 2. Wt. of
 3. Wt. after solution, with filter paper 21.80 gm.
 4. Less wt. F. P. (2) 2.51 gm.
 5. Wt. Insol. Residue (3 minus 4) 19.29 gm. 96.0 %
 6. Wt. lost by solution (1 minus 5) 0.83 gm. 4.0 %
 7. To balance (5 plus 6) 20.12 gm. 100 %

B. Subsidiation:

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

Well No. W— 0117
 Depth 1187 1/2 to 1187 1/2
 No. samples used 1
 Analyst Pannel
 Date 4/30/35

C. Screen Analysis 19.13

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	<u>6.82</u>	<u>36.3</u>
1/4-1/8 mm	<u>7.33</u>	<u>38.8</u>
1/8-1/16	<u>3.70</u>	<u>19.6</u>
Pan	<u>1.00</u>	<u>5.3</u>
Total	<u>18.85</u>	<u>100.0</u>

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

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

Analyst Filasetu
 Date July 5-5

Wt. of sample 3.40 gm. 100.0% Shape Analysis:

Heavy Minerals 51 gm. 15.0 % A.....%: a.....%: C.....%

Light Minerals 2.89 gm. 85.0 % r.....%: R.....%

Minerals Identified:

Heavy Concentrate	No. of Grains	Rel. %
Pyrite	800	89.6
kaucrona	12	1.3
limonite Agg	37	4.1
zircon	14	1.6
garnet	3	.3
tremolite	1	.1
Rutile	03	.3
Barite	18	2.0
Nornblandr	1	.1
tourmaline	5	.6
Total	894	100%

Classification Grouping:

Primary Minerals:	Absol. %
kaucrona	.2
zircon	.2
garnet	.1
Tremolite	.0
Rutile	.1
norblandr	.0
Tourmaline	.1
quartz	64.1
Feldspar	1.7
clay minerals	3.7
Secondary Minerals: <u>29.8</u> %	
Pyrite	13.4
limonite Agg	.6
Chart	15.5
Barite	.3
Total	100%

Light Concentrate

quartz	1040	75.5
chart	250	18.2
clay	60	4.3
Feldspar	28	2.0
Total	1378	100%

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

S/S and Sh. 95-100% idlt grey Calc. 4% Sol, friable
in part sandy; washed sample contains sand
A to C; maj 9-d 1/4-1/8, prin sub 1/2-1/4.

DEEP WELL STUDY

MECHANICAL ANALYSIS

- A. Acid treatment (HCl ¹⁵%)
1. Sample weight 20.19 gm. 100.0%: F. P. _____
 2. Wt. of
 3. Wt. after solution, with filter paper 21.54 gm.
 4. Less wt. F. P. (2) 2.28 gm.
 5. Wt. Insol. Residue (3 minus 4) 19.26 gm. 95.4 %
 6. Wt. lost by solution (1 minus 5) 93 gm. 4.6 %
 7. To balance (5 plus 6) 0.19 gm. 100.0 %

Well No. W- 0117
 Depth 1187 1/2 to 1191 1/2
 No. samples used _____
 Analyst Pennel
 Date 4/30/35

- B. Subsidiation:
1. Original Wt. gm. 100.0%
 2. Cylinder (+1/32) gm. %
 3. Jar (1/32-1/64) gm. %
 4. Drain gm. %

C. Screen Analysis 19.06

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	<u>6.66</u>	<u>35.2</u>
1/4-1/8 mm	<u>6.83</u>	<u>36.0</u>
1/8-1/16	<u>4.08</u>	<u>21.6</u>
Pan	<u>1.37</u>	<u>7.2</u>
Total	<u>18.94</u>	<u>100.0</u>

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

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

Analyst Filaseta
 Date July 5-35

- Wt. of sample 3.17 gm. 100.0% Shape Analysis:
- Heavy Minerals43 gm. 13.6 % A. %: a. %: C. %
- Light Minerals 2.74 gm. 86.4 % r %: R %.

Minerals Identified:	No. of Grains	Rel. %	Classification Grouping:	Absol. %
Heavy Concentrate			Primary Minerals: <u>82.7</u> %	
Tourmaline	<u>13</u>	<u>1.1</u>	Tourmaline	<u>.1</u>
Barite	<u>11</u>	<u>.9</u>	Zircon	<u>.2</u>
Zircon	<u>19</u>	<u>1.5</u>	Garnet	<u>.1</u>
Garnet	<u>6</u>	<u>.5</u>	Rutile	<u>.1</u>
Sphalerite	<u>19</u>	<u>1.5</u>	Hornblende	<u>.0</u>
Rutile	<u>7</u>	<u>.6</u>	Leucocane	<u>.3</u>
Hornblende	<u>1</u>	<u>.1</u>	Quartz	<u>64.9</u>
Pelite	<u>1050</u>	<u>85.3</u>	Clays	<u>15.7</u>
Limonite Agg.	<u>74</u>	<u>6.1</u>	Feldspar	<u>1.3</u>
Leucocane	<u>30</u>	<u>2.4</u>		
Total	<u>1230</u>	<u>100%</u>	Secondary Minerals: <u>17.3</u> %	
Light Concentrate			Pelite	<u>11.7</u>
Quartz	<u>870</u>	<u>75.2</u>	Limonite Agg.	<u>.8</u>
Chart	<u>60</u>	<u>5.2</u>	Barite	<u>.1</u>
Claymin.	<u>210</u>	<u>18.1</u>	Sphalerite	<u>.2</u>
Feldspar	<u>18</u>	<u>1.5</u>	Chart	<u>4.0</u>
Total	<u>1158</u>	<u>100%</u>	Total	<u>100%</u>

Revised Lithologic Description (from descriptive log and laboratory data).
Siltstone + shale 95-100% dk gray to nearly blk
Calc 4.6% Sol, firm in part, sandy micac,
washed sample contains sand A to C, Maj grd
1/4-1/8, prin sub, 1/2-1/4

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl 1.5%)

1. Sample weight 20.11 gm. 100.0%: F. P. _____
2. Wt. of _____
3. Wt. after solution, with filter paper 21.95 gm.
4. Less wt. F. P. (2) 2.34 gm.
5. Wt. Insol. Residue (3 minus 4) 9.11 gm. 96.0%
6. Wt. lost by solution (1 minus 5) 1.00 gm. 5.0%
7. To balance (5 plus 6) 20.11 gm. 100.0%

B. Subsidiary:

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

Well No. W- 0117

Depth 11915 to 11965

No. samples used _____

Analyst Pennel

Date 4/30/35

C. Screen Analysis 18.87

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	<u>56.18</u>	<u>33.2</u>
1/4-1/8 mm	<u>5.96</u>	<u>32.0</u>
1/8-1/16	<u>5.40</u>	<u>28.9</u>
Pan	<u>1.10</u>	<u>5.9</u>
Total	<u>18.64</u>	<u>100.0</u>

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

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

Analyst T. Laseta

Date July 5, 35

Wt. of sample 3.49 gm. 100.0%

Heavy Minerals 1.52 gm. 15.0%

Light Minerals 2.97 gm. 85.0%

Shape Analysis:

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

r. _____%: R. _____%

Minerals Identified:
 Heavy Concentrate

No. of Grains	Rel. %
<u>26</u>	<u>1.5</u>
<u>41</u>	<u>2.3</u>
<u>24</u>	<u>1.4</u>
<u>25</u>	<u>1.4</u>
<u>4</u>	<u>.2</u>
<u>3</u>	<u>.5</u>
<u>1</u>	<u>.1</u>
<u>1500</u>	<u>84.8</u>
<u>100</u>	<u>2.7</u>
<u>37</u>	<u>100%</u>

Classification Grouping:

Primary Minerals:	Absol. %
<u>81.8</u> %	
Tourmaline	<u>.2</u>
Zircon	<u>.2</u>
Garnet	<u>.0</u>
Rutile	<u>.1</u>
Hornblende	<u>.0</u>
Leucosane	<u>.3</u>
Quartz	<u>61.1</u>
Clays	<u>18.2</u>
Feldspars	<u>1.7</u>

Light Concentrate

<u>1080</u>	<u>72.0</u>
<u>70</u>	<u>4.7</u>
<u>320</u>	<u>21.3</u>
<u>30</u>	<u>2.0</u>

Secondary Minerals: 18.2%

Barite	<u>.2</u>
Sphalerite	<u>.3</u>
Chert	<u>4.0</u>
Pyrite	<u>12.9</u>
Limonite Agg.	<u>.8</u>
Total	<u>100%</u>

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

5570-8070 Amajarg-d 1/2-1/4, prin sub 1/4-1/8
sls 20-25% dk gray red, firm, massive, 57%
sol; pyrite 1.5% in xling masses

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15%)

- | | | | | |
|--|-----------|--------|-----------------|--|
| 1. Sample weight | 20.05 gm. | 100.0% | 2. Wt. of F. P. | |
| 3. Wt. after solution, with filter paper | 21.06 gm. | | | |
| 4. Less wt. F. P. (2) | 2.29 gm. | | | |
| 5. Wt. Insol. Residue (3 minus 4) | 18.77 gm. | 93.6% | | |
| 6. Wt. lost by solution (1 minus 5) | 1.28 gm. | 6.4% | | |
| 7. To balance (5 plus 6) | 20.05 gm. | 100.0% | | |

B. Subsidiary:

- | | | |
|---------------------|-----------|--------|
| 1. Original Wt. | 18.77 gm. | 100.0% |
| 2. Cylinder (+1/32) | 2.14 gm. | % |
| 3. Jar (1/32-1/64) | 2.00 gm. | % |
| 4. Drain | 4.00 gm. | % |

Well No. W- 0117

Depth 1196 1/2 to 1200 1/2

No. samples used 1

Analyst Pennel

Date 4/30/31

C. Screen Analysis 12.39

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	76.63	53.7
1/4-1/8 mm	1.58	12.8
1/8-1/16	2.47	20.0
Pan	1.67	13.5
Total	12.35	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. }
 Bromoform } Sp. gr. Size-Grade(s) 18-1/16 mm.

Analyst Filasota
 Date July 6-35

Wt. of sample 2.40 gm. 100.0%

Shape Analysis:

Heavy Minerals 10 gm. 4.2%

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

Light Minerals 2.30 gm. 95.8%

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

Minerals Identified:
 Heavy Concentrate

No. of Grains Rel. %

Classification Grouping:

Primary Minerals: 86.9%

Absol. %

Zircon	20	1.3
Baite	22	1.4
Tourmaline	17	1.1
Sphalerite	2	.1
Rutile	7	.5
Epidote	1	.1
Pyrite	420	92.1
Limonite Agg	16	1.0
Leucocane	37	2.4
Total	542	100%

Zircon	.05
Tourmaline	.05
Rutile	.0
Epidote	.0
Pyrite	.1
Leucocane	39.4
quartz	45.5
clays	1.8
Feldspars	

Light Concentrate

Secondary Minerals: 13.1%

quartz	910	41.1
clay	210	9.5
clays	1050	47.5
Feldspars	43	1.9
Total	2213	100%

Baite	.05
sphalerite	.0
pyrite	3.9
Limonite Agg	.05
clay	9.1
Total	100%

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

shale 95-100% med gr, calc, 6.4% sol, friable
Micae, in part silty, a few frags, of rd. shale, probably
promabore

DEEP WELL STUDY

MECHANICAL ANALYSIS

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

1. Sample weight	20.00 gm.	100.0%	2. Wt. of F. P.	
3. Wt. after solution, with filter paper	20.55 gm.			
4. Less wt. F. P. (2)	2.06 gm.			
5. Wt. Insol. Residue (3 minus 4)	18.49 gm.	92.5%		
6. Wt. lost by solution (1 minus 5)	1.51 gm.	7.5%		
7. To balance (5 plus 6)	20.00 gm.	100.0%		

B. Subsidiation:

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

Well No. W- 0117
 Depth 1200 1/2 to 1204
 No. samples used 1
 Analyst Pennel
 Date 4/18/35

C. Screen Analysis 18.45

SIZE	GRAMS	%
2 plus		
2+1 mm	1.07	
1-1/2 mm	1.97	
1/2-1/4 mm	2.49	
1/4-1/8 mm	4.11	
1/8-1/16	1.29	
Pan	1.19	
Total	18.12	100.0

Dust loss from pan during screening

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } 2.934 Sp. gr. Size-Grade(s) 1/8-1/16 mm.

Analyst KUNDERT-
 Date APR. 30, 1935

Wt. of sample	3.62 gm.	100.0%
Heavy Minerals	.25 gm.	7%
Light Minerals	3.37 gm.	93%

Shape Analysis:

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

Minerals Identified:

Heavy Concentrate	No. of Grains	Rel. %
Pyrite	1083	7
Zircon-Unzoned	10	.3
Jourmaline-Green	7	.6
" - Brown	7	.6
Garnet	1	.1
Leucoxene	14	1.2
Scale	24	2.0
Clay Aggregates	30	2.5
Total	1182	100%

Classification Grouping:

Primary Minerals:	Absol. %
Zircon-Unzoned	.1
Jourmaline-Green	.0
" - Brown	.0
Garnet	.0
Clay Minerals	21.6
Feldspar	.2
Quartz	69.0
Clay Aggregates	.2

Light Concentrate

Chert	40	2.4
Clay Minerals	389	23.3
Feldspar	4	.2
Quartz	1225	74.1
Total	1655	100%

Secondary Minerals:

Pyrite	6.4
Leucoxene	.1
Scale	.2
Chert	2.2

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

ss 60% ± to a; major grade 1/8-1/16; prin sub 1/4-1/8; siltstone
 30% ± light to dark gray non-calcareous massive; shale 10%
 blk. carbon. non-calcareous, fissile; pyrite 5% ±

DEEP WELL STUDY

MECHANICAL ANALYSIS

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

1. Sample weight *H₂O* 20.00 gm. 100.0%: F. P. _____
2. Wt. of _____
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. Subsidiation:

1. Original Wt. 20.00 gm. 100.0%
2. Cylinder (+1/32) 21.86 11.62 gm. 98.1 %
- 2.24
- 2.50
3. Jar (1/32-1/64) 1.3 gm. .6 %
- 2.37
4. Drain 2.5 gm. 1.3 %

Well No. W- 0117

Depth 1204 to 1208 1/2

No. samples used 1

Analyst Rennel

Date 4/18/35

C. Screen Analysis 19.61

SIZE	GRAMS	%
2 plus		
2-1 mm	<u>.56</u>	
1-1/2 mm	<u>.76</u>	
1/2-1/4 mm	<u>1.12</u>	
1/4-1/8 mm	<u>2.63</u>	
1/8-1/16	<u>11.03</u>	
Pan	<u>3.37</u>	
Total	<u>19.47</u>	<u>100.0</u>

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 KONDEERT-

Date APR. 30, 1935

- Wt. of sample 2.43 gm. 100.0%
- Heavy Minerals15 gm. 4 %
- Light Minerals 2.28 gm. 96 %

Shape Analysis:

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

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

Minerals Identified;

Heavy Concentrate

Mineral	No. of Grains	Rel. %
Apatite		.7
Pyrite	1365	79.2
Zircon-Unzoned	1	.1
Tourmaline-Green	2	.2
"-Brown	2	.1
Garnet	2	.1
Leucosene	42	2.4
Scale	28	1.6
Clay Aggregates	259	15.0
Carbonates	3	.2
Total	1723	100%

Classification Grouping:

Primary Minerals: 93.1 %

Absol. %

Apatite		
Zircon-Unzoned		
Tourmaline-Green		
"-Brown		
Garnet		
Feldspar		.1
Muscovite		.0
Quartz		74.0
Clay Minerals		19.0

Light Concentrate

Chert	70	3.4
Clay Minerals	400	19.3
Feldspars	1	.1
Glaucouite	1	.1
Muscovite	1	.0
Quartz	1600	77.1
Total	2077	100%

Secondary Minerals: 6.9 %

Leucosene		.1
Pyrite		3.3
Scale		.1
Carbonates		.0
Chert		3.3
Glaucouite		.1
Total		100%

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

Ss, 85%± A to a, maj. grade 1/8-1/16; principal subsidiary
1/16-1/32; 15%± light to dark gray, massive;
non-calcareous - pyrite 3%±

DEEP WELL STUDY

MECHANICAL ANALYSIS

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

- | | | | |
|--|-----------|--------|----------------------|
| 1. Sample weight | 20.00 gm. | 100.0% | 2. Wt. of F. P. |
| 3. Wt. after solution, with filter paper | 21.05 gm. | | |
| 4. Less wt. F. P. (2) | 2.07 gm. | | |
| 5. Wt. Insol. Residue (3 minus 4) | 18.98 gm. | 94.9 % | |
| 6. Wt. lost by solution (1 minus 5) | 1.02 gm. | 5.1 % | |
| 7. To balance (5 plus 6) | 20.00 gm. | 100 % | |

Well No. W- 0117
 Depth 1208 1/2 to 1216 1/2
 No. samples used 2
 Analyst Penne1
 Date 4/18/35

B. Subsidiation:

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

C. Screen Analysis 18.93

SIZE	GRAMS	%
2 plus		
1 mm	1.82	9.8
1-1/2 mm	1.40	7.5
1/2-1/4 mm	1.50	8.0
1/4-1/8 mm	2.10	11.3
1/8-1/16	9.19	49.2
Pan	2.65	14.2
Total	18.67	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 D. Frasciè
 Date 5-2-35

- | | | |
|--------------------------|----------|--------|
| Wt. of sample | 3.00 gm. | 100.0% |
| Heavy Minerals | .07 gm. | % |
| Light Minerals | 2.23 gm. | 98 % |

Shape Analysis:

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

Minerals Identified:
 Heavy Concentrate

	No. of Grains	Rel. %
pyrite	1034	75.0
zircon	24	1.7
tourmaline green	4	.3
tourmaline pink	1	.1
tourmaline brown	1	.1
garnet	5	.4
leucosene	21	1.5
quartz	105	7.7
scale	95	6.9

Classification Grouping:

Primary Minerals: 98.8 %	Absol. %
zircon	0
tourmaline green	0
tourmaline pink	0
tourmaline brown	0
garnet	0.53
quartz	1.2
leucosene	1.2
clay minerals	11.7

Total 1378 100%

Light Concentrate

feldspar	24	1.2
quartz	1760	86.9
clay-minerals	240	11.9

Secondary Minerals: 1.8 %

pyrite	1.6
leucosene	0.2
scale	0.2

Total 2027 100%

Total 100%

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

Sandstone: 95% - Angular to sub angular
 major grade 1/8-1/16 - chief sub-sidiary 1/4 - 1/2 mm silt
 Stone hard to dark gray - massive non calcareous - shale
 5% black carbonaceous fissile non calc.

DEEP WELL STUDY

MECHANICAL ANALYSIS

- A. Acid treatment (HCl.....%)
 1. Sample weight 20.00 gm. 100.0% : F. P. 220
 2. Wt. of
 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. %

Well No. W-- 0117
 Depth 1216 1/2 to 1221 1/2
 No. samples used 1
 Analyst Penne
 Date 4/18/35

- B. Subsidiation:
 1. Original Wt. 20.00 gm. 100.0%
 2. Cylinder (+1/32) 26.73 19.63 gm. 98.2 %
 3. Jar (1/32-1/64) 33 gm. %
 4. Drain 21 gm. 1.0 %

C. Screen Analysis 19.58

SIZE	GRAMS	%
2 plus		
2 +1 mm	<u>.66</u>	<u>3.4</u>
1-1/2 mm	<u>1.20</u>	<u>6.1</u>
1/2-1/4 mm	<u>1.64</u>	<u>8.4</u>
1/4-1/8 mm	<u>2.59</u>	<u>13.2</u>
1/8-1/16	<u>10.26</u>	<u>52.4</u>
Pan	<u>3.22</u>	<u>16.5</u>
Total	<u>19.57</u>	<u>100.0</u>

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

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

Analyst D. Frascchi
 Date 5-2-35

Wt. of sample 3.32 gm. 100.0% Shape Analysis:

Heavy Minerals12 gm. % A.....%: a.....%: C.....%

Light Minerals 3.20 gm. 96 % r.....%: R.....%

Minerals Identified; Heavy Concentrate No. of Grains Rel. % Classification Grouping: Primary Minerals: 96.2 % Absol. %

pyrite	50	53.7	zircon		
zircon	11	.9	tourmaline green		
tourmaline green	3	.2	brown		
leucocene	483	25.6	quartz		72.7
hematite	131	6.9	clay-minerals		17.6
quartz	65	3.4	muscovite		6.0
scale	136	7.2			

Total 1887 100%

Light Concentrate	No. of Grains	Rel. %	Secondary Minerals:	Absol. %
clay-minerals	144	18.1	pyrite	2.2
quartz	600	75.7	leucocene	1.0
muscovite	48	6.2	hematite	.3
			scale	.3

Total 79 100% Total 100%

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

Sandstone 90% - angular to sub angular - major grade 1/8-1/16 mm. chief subsidiary 1/4-1/8. Siltstone 10% - hard - dark gray massive - man calcareous. Some mica - pyrite.

DEEP WELL STUDY

MECHANICAL ANALYSIS

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

1. Sample weight 20.00 gm. 100.0%: F. P.
2. Wt. of
3. Wt. after solution, with filter paper 52 gm.
4. Less wt. F. P. (2) 2.45 gm.
5. Wt. Insol. Residue (3 minus 4) 9.07 gm. 95.3 %
6. Wt. lost by solution (1 minus 5) 9.3 gm. 4.7 %
7. To balance (5 plus 6) 20.00 gm. 100.0 %

B. Subsidiation:

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

Well No. W- 0.117

Depth 1221 1/2 to 1226 1/2

No. samples used 1

Analyst Pennel

Date 4/18/35

C. Screen Analysis 18.93

SIZE	GRAMS	%
2 plus		
#1 mm	1.90	10
1-1/2 mm	2.76	14.6
1/2-1/4 mm	2.79	14.8
1/4-1/8 mm	3.05	16.2
1/8-1/16	5.94	31.4
Pan	1.44	7.6
Total	18.88	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. }
 Bromoform } Sp. gr. Size-Grade(s) 1/8-1/6 mm.

Analyst D. Frascchi

Date 5-35

Wt. of sample 3.06 gm. 100.0%

Heavy Minerals12 gm. 3.9 %

Light Minerals 2.94 gm. 96.1 %

Shape Analysis:

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

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

Minerals Identified:

Heavy Concentrate	No. of Grains	Rel. %
pyrite	44	87.2
zircon	16	1.2
tourmaline green	6	.5
brown	6	.5
pink	1	.1
blue	1	.1
garnet	3	.2
leucosene	22	1.7
muscovite	3	.2
scale	110	8.5
Total	1312	100%

Classification Grouping:

Primary Minerals:	Absol. %
.....	96.5
zircon	0
tourmaline green	0
brown	0
pink	0
blue	0
garnet	0
muscovite	0
quartz	80.5
clay-min	15.0

Light Concentrate

	No. of Grains	Rel. %
quartz	1920	83.7
chert	16	.7
clay minerals	360	15.6

Secondary Minerals:

	Absol. %
.....	4.5
pyrite	3.4
leucosene	.1
scale	.3
chert	0.7

Total 2296 100% Total 100%

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

sandstone 95% - Angular to sub angular - major grade 1/8-1/16 - chief subsidiary 1/4-1/8. siltstone 4% - hard - dark gray - non calcareous - Pyrite 1% - some mica

DEEP WELL STUDY

MECHANICAL ANALYSIS

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

1. Sample weight 20.00 gm. 100.0% : F. P. _____
2. Wt. of
3. Wt. after solution, with filter paper 19.32 gm.
4. Less wt. F. P. (2) _____ gm.
5. Wt. Insol. Residue (3 minus 4) 7.29 gm. 36.4%
6. Wt. lost by solution (1 minus 5) 2.71 gm. 13.6%
7. To balance (5 plus 6) 20.00 gm. 100.0%

B. Subsidiation:

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

Well No. W- 0117

Depth 12.26 1/2 to 12.35 1/2

No. samples used 2

Analyst Pennel

Date 4/14/35

C. Screen Analysis 17.16

SIZE	GRAMS	%
2 plus		
2+1 mm	<u>1.74</u>	<u>10.0</u>
1-1/2 mm	<u>1.66</u>	<u>9.7</u>
1/2-1/4 mm	<u>2.21</u>	<u>12.9</u>
1/4-1/8 mm	<u>2.20</u>	<u>12.8</u>
1/8-1/16	<u>6.10</u>	<u>35.6</u>
Pan	<u>3.25</u>	<u>19.0</u>
Total	<u>17.16</u>	<u>100.0</u>

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } 2.934 Sp. gr. Size-Grade(s) 1/8-1/16 mm.

Analyst KUNDEBT

Date MAY 1, 1935

Wt. of sample 3.24 gm. 100.0% Shape Analysis:

Heavy Minerals14 gm. 4.3% A. %: a. %: C. %

Light Minerals 3.10 gm. 95.7% r %: R %

Minerals Identified;

Heavy Concentrate

Purite
Zircon-Unzoned
Tourmaline-Green
-Brown
Garnet
Leucosene
Scale
Clay Aggregates

No. of Grains

Rel. %

<u>925</u>	<u>87.1</u>
<u>1</u>	<u>.1</u>
<u>2</u>	<u>.2</u>
<u>1</u>	<u>.1</u>
<u>15</u>	<u>1.4</u>
<u>40</u>	<u>3.1</u>
<u>50</u>	<u>4.8</u>

Classification Grouping:

Primary Minerals: 97.1%

Zircon-Unzoned
Tourmaline-Green
-Brown
Garnet
Clay Minerals
Feldspars
Muscovite
Quartz

Absol. %

19.3
.3
.5
74.0

Total 1038 100%

Light Concentrate

Chert
Clay Minerals
Feldspars
Muscovite
Quartz

<u>40</u>	<u>1.9</u>
<u>417</u>	<u>20.0</u>
<u>7</u>	<u>.3</u>
<u>10</u>	<u>.5</u>
<u>1600</u>	<u>77.3</u>

Secondary Minerals: 5.9%

Purite
Leucosene
Scale
Chert

3.9
.0
.2
1.8

Total 2071 100%

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

ss. ± 65% a. A to a; major grade 1/8-1/16; prim sub. 1/2-1/4; s/s 15% +
light to dark gray, massive, non-calcareous; shale 15% + black carb-
oniferous; purite 2% +; muscovite < 1%

DEEP WELL STUDY

MECHANICAL ANALYSIS

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

1. Sample weight 20.00 gm. 100.0% : F. P.
2. Wt. of
3. Wt. after solution, with filter paper 19.74 gm.
4. Less wt. F. P. (2) 2.42 gm.
5. Wt. Insol. Residue (3 minus 4) 17.32 gm. 86.6 %
6. Wt. lost by solution (1 minus 5) 68 gm. 3.4 %
7. To balance (5 plus 6) 20.00 gm. 100.0 %

B. Subsidiation:

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

Well No. W- 0117

Depth 12.35 1/2 to 12.45 1/2

No. samples used 2

Analyst Pennel

Date 4/18/35

C. Screen Analysis 17.12

SIZE	GRAMS	%
2 plus		
2+1 mm	<u>2.22</u>	<u>13.1</u>
1-1/2 mm	<u>2.41</u>	<u>14.3</u>
1/2-1/4 mm	<u>2.57</u>	<u>15.2</u>
1/4-1/8 mm	<u>2.56</u>	<u>15.2</u>
1/8-1/16	<u>4.81</u>	<u>28.5</u>
Pan	<u>2.32</u>	<u>13.7</u>
Total	<u>16.89</u>	<u>100.0</u>

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } 2.937 Sp. gr. Size-Grade(s) 1/2 - 1/16 mm.

Analyst KUNBERT-

Date MAY 2, 1935

Wt. of sample 350 gm. 100.0% Shape Analysis:

Heavy Minerals 75 gm. 7.2 % A.....% : a.....% : C.....%

Light Minerals 3.25 gm. 3.3 % r.....% : R.....%

Minerals Identified: No. of Rel. Classification Grouping: Absol. %
Heavy Concentrate Grains % Primary Minerals: 83.3 %

Purite	4500 (est)	97.0	Zircon-Unzoned		
Zircon-Unzoned	20	.4	Tourmaline-Green		
Tourmaline-Green	2	.0	"-Brown		
"-Brown	1	.0	Clay Minerals		<u>24.4</u>
Leucoxene	30	.6	Feldspar		<u>.2</u>
Chlorite	2	.0	Muscovite		<u>.3</u>
Scale	46	.0	Quartz		<u>58.4</u>
Clay Aggregates	45	.0			

Total 4646 100%

Light Concentrate	No. of Grains	Rel. %	Secondary Minerals:	%	Absol. %
Chert	137	10.3	Purite	<u>16.7</u>	<u>7.0</u>
Clay Minerals	353	26.2	Chlorite		
Feldspar	3	.2	Leucoxene		<u>.1</u>
Muscovite	4	.3	Scale		<u>9.6</u>
Quartz	800	63.0	Chert		
Total	1272	100%	Total		<u>100%</u>

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

Ss: 65% + A to a; major grade 1/2-1/16; principal subsidiary 1/2-1/4;
shale 20% dark gray massive, non-calcareous, siltstone 15%
light to dark gray; +5% pyrite

DEEP WELL STUDY

MECHANICAL ANALYSIS

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

1. Sample weight	20.00 gm.	100.0%	2. Wt. of F. P.
3. Wt. after solution, with filter paper	20.11 gm.		
4. Less wt. F. P. (2)	3.11 gm.		
5. Wt. Insol. Residue (3 minus 4)	1.785 gm.	8.93%	
6. Wt. lost by solution (1 minus 5)	2.15 gm.	10.7%	
7. To balance (5 plus 6)	20.00 gm.	100.0%	

Well No. W— 0112
 Depth 12.45 1/2 to 12.50 1/2
 No. samples used 1
 Analyst Pennel
 Date 4/18/35

B. Subsidiary:

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

C. Screen Analysis 17.62

SIZE	GRAMS	%
2 plus		
2+1 mm	2.04	11.7
1-1/2 mm	3.20	18.4
1/2-1/4 mm	3.19	18.3
1/4-1/8 mm	2.25	15.7
1/8-1/16	4.33	24.8
Pan	1.90	10.9
Total	17.44	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } 2.923 Sp. gr. Size-Grade(s) 2-1/2 to 1/2 mm.

Analyst KUNDERT
 Date MAY 2, 1935

Wt. of sample	4.34 gm.	100.0%
Heavy Minerals . . . . .	.30 gm.	6.9%
Light Minerals	4.04 gm.	93.1%

Shape Analysis:

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

Minerals Identified:

Heavy Concentrate	No. of Grains	Rel. %	Classification Grouping:	Absol. %
Pyrite	2350	93.1	Zircons-Unzoned	.0
Zircon-Unzoned	14	.6	Tourmaline-Green	.0
Tourmaline-Green	1	.0	" - Brown	.0
" - Brown	3	.1	Garnet	19.5
Garnet	1	.0	Clay Minerals	67.7
Leucopene	27	1.1	Quartz	.2
Clay Aggregates	65	2.7	Feldspar	.1
Scale	60	2.4	Muscovite	
Total	2521	100%		
Light Concentrate	No. of Grains	Rel. %	Secondary Minerals:	Absol. %
Chert	97	6.2	Pyrite	6.4
Clay Minerals	325	20.6	Leucopene	.1
Feldspar	3	.2	Chert	5.8
Muscovite	2	.1	Scale	.2
Quartz	1150	72.9		
Total	1577	100%		

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

Sls: 50-60% dark gray to black, non-calcareous, firm, massive; Ss. 30-40% A to a, major grade 1/8-1/16, prin. sub. 1-1/2; shale 5-10% buff to brown, firm, massive, non-calcareous-

DEEP WELL STUDY

MECHANICAL ANALYSIS

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

1. Sample weight 20.00 gm. 100.0%: 2. Wt. of F. P. _____
3. Wt. after solution, with filter paper 20.82 gm.
4. Less wt. F. P. (2) _____ gm.
5. Wt. Insol. Residue (3 minus 4) 18.57 gm. 92.8%
6. Wt. lost by solution (1 minus 5) 1.43 gm. 7.2%
7. To balance (5 plus 6) 20.00 gm. _____%

Well No. W- 0117

Depth 1250 1/2 to 1259 1/2

No. samples used 2

Analyst Pennel

Date 4/18/35

B. Subsidiation:

1. Original Wt. 18.57 gm. 100.0%
2. Cylinder (+1/32) 1.45 1.296 gm. 6.4%
3. Jar (1/32-1/64) 2.00 2.14 gm. 11.5%
4. Drain _____ gm. 13.1%

C. Screen Analysis 12.85

SIZE	GRAMS	%
2 plus		
2-1 mm	<u>8.26</u>	<u>46</u>
1-1/2 mm		
1/2-1/4 mm		
1/4-1/8 mm		
1/8-1/16	<u>4.53</u>	<u>36.4</u>
Pan		
Total	<u>12.79</u>	<u>100.0</u>

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. } 98± Sp. gr. Size-Grade(s) 1/4-Pan mm.

Bromoform }

Analyst D. Frascchi

Date - 2 - 35

Wt. of sample 3.13 gm. 100.0%

Shape Analysis:

Heavy Minerals16 gm. 4.3%

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

Light Minerals 3.57 gm. 95.7%

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

Minerals Identified:

Heavy Concentrate	No. of Grains	Rel. %
pyrite	170	94.8
zircon	12	2.2
tourmaline blue	1	.1
brown	1	.1
green	1	.1
leucosena	19	1.9
scale	8	.8
Total		100%

Classification Grouping:

Primary Minerals:	Absol. %
95.8%	
zircon	0.1
tourmaline blue	
brown	
green	
quartz	26.4
clay minerals	66.0
feldspar	1.1
muscovite	2.2

Light Concentrate	No. of Grains	Rel. %
quartz	1920	27.6
clay minerals	4700	69.0
feldspar	80	1.1
muscovite	160	2.3
Total		100%

Secondary Minerals:	Absol. %
4.1%	
pyrite	4.1
leucosena	0.1
scale	

Total 6960 100% Total 100%

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

Shale 92% - hard - dark grayish brown - sandstone
8% - angular to sub angular - major grade 1/8 - 1/16 mm
chief subsidiary 1/10 - 1/32

DEEP WELL STUDY

MECHANICAL ANALYSIS

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

1. Sample weight 20.00 gm. 100.0% : 2. Wt. of F. P.

3. Wt. after solution, with filter paper 21.04 gm.

4. Less wt. F. P. (2)45 gm.

5. Wt. Insol. Residue (3 minus 4) 18.59 gm. 92.9%

6. Wt. lost by solution (1 minus 5) 1.41 gm. 7.1%

7. To balance (5 plus 6) 20.00 gm. 100.0%

Well No. W- 0117

Depth 1259 1/2 to 1263 1/2

No. samples used 1

Analyst Pennel

Date 4/18/35

B. Subsidiation:

1. Original Wt. gm. 100.0%

2. Cylinder (+1/32) gm. %

3. Jar (1/32-1/64) gm. %

4. Drain gm. %

C. Screen Analysis 18.30

SIZE	GRAMS	%
2 plus		
#1 mm	6.37	35.1
1-1/2 mm	2.00	11.0
1/2-1/4 mm	2.18	12.0
1/4-1/8 mm	2.35	12.9
1/8-1/16	3.74	20.6
Pan	1.52	8.4
Total	18.16	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 D. Frasca

Date 4-35

Wt. of sample 2.73 gm. 100.0%

Heavy Minerals56 gm. 15%

Light Minerals 2.17 gm. 85%

Shape Analysis:

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

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

Minerals Identified:	No. of Grains	Rel. %
Heavy Concentrate		
pyrite	360	99.2
zircon	4	.8
tourmaline	2	.1
garnet		
leucosane		
Total		100%
Light Concentrate		
clay minerals	320	28.8
quartz	1600	73.2
feldspar	64	2.9
muscovite	3	.1
Total		100%

Classification Grouping:	Absol. %
Primary Minerals: <u>85.1%</u>	
Secondary Minerals: <u>14.9%</u>	
pyrite	99.2
zircon	0.8
tourmaline	0.1
quartz	73.2
feldspar	2.9
clay minerals	28.8
muscovite	0.1
Total	100%

Total 21.87 100% Total 100%

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

Tandane 92% - angular to sub-angular - mayan grade 1mm - chief subsidiary - 1/8-1/16 mm. Shale 8% - black - carbonaceous - fissile - Pyrite - mica.

DEEP WELL STUDY

MECHANICAL ANALYSIS

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

1. Sample weight	<u>20.00</u> gm.	100.0%	2. Wt. of F. P. _____
3. Wt. after solution, with filter paper	<u>20.55</u> gm.		
4. Less wt. F. P. (2)	<u>2.39</u> gm.		
5. Wt. Insol. Residue (3 minus 4)	<u>18.1</u> gm.	<u>90.8</u> %	
6. Wt. lost by solution (1 minus 5)	<u>1.84</u> gm.	<u>9.2</u> %	
7. To balance (5 plus 6)	<u>20.00</u> gm.	<u>100.0</u> %	

Well No. W— 0117
 Depth 1263 1/2 to 1268 1/2
 No. samples used 1
 Analyst Penne
 Date 4/14/35

B. Subsidiation:

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

C. Screen Analysis 18.07

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm	<u>9.41</u>	<u>52.2</u>
1/2-1/4 mm		
1/4-1/8 mm	<u>2.84</u>	<u>15.7</u>
1/8-1/16	<u>3.82</u>	<u>21.2</u>
Pan	<u>1.96</u>	<u>10.9</u>
Total	<u>18.03</u>	<u>100.0</u>

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. } 2.93± Sp. gr. Size-Grade(s) _____ mm.
 Bromoform }

Analyst D. Frasca
 Date 5 - 35

Wt. of sample 3.77 gm. 100.0%

Shape Analysis:

Heavy Minerals59 gm. 15.7 %

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

Light Minerals 3.18 gm. 84.3 %

r. _____ %: R. _____ %.

Minerals Identified;
 Heavy Concentrate

No. of Grains Rel. %

Classification Grouping:

Absol. %

Primary Minerals: 84.4 %

pyrite
tourmaline dr
leucocene
muscovite

<u>tourmaline brown</u>	_____	<u>0</u>
<u>muscovite</u>	<u>.1</u>	<u>.3</u>
<u>Clay-minerals</u>	<u>.2</u>	<u>19.9</u>
	<u>.4</u>	<u>32.5</u>
		<u>11.7</u>

Total 058 100%

Light Concentrate

Secondary Minerals: 15.6 %

<u>Clay-minerals</u>	<u>544</u>	<u>28.6</u>
<u>quartz</u>	<u>1440</u>	<u>62.3</u>
<u>chert</u>	<u>320</u>	<u>13.9</u>
<u>muscovite</u>	<u>4</u>	<u>.2</u>

pyrite _____ 15.6
leucocene _____ 0

Total 2308 100%

Total 100%

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

sandstone 90% - angular - sub angular medium
grade 1/4 in - chief subsidiary - 5/16 light to dark
gray - non calc. firm. shale and coal fragments - 1.5%

DEEP WELL STUDY

MECHANICAL ANALYSIS

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

1. Sample weight 20.02 gm. 100.0%: F. P. _____
2. Wt. of _____
3. Wt. after solution, with filter paper 20.62 gm.
4. Less wt. F. P. (2) 2.15 gm.
5. Wt. Insol. Residue (3 minus 4) 18.47 gm. 92.3 %
6. Wt. lost by solution (1 minus 5) 1.53 gm. 7.7 %
7. To balance (5 plus 6) 20.00 gm. 100.0 %

B. Subsidiation:

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

Well No. W— 0117

Depth 1268 1/2 to 1273 1/2

No. samples used 1

Analyst Pennel

Date 4/18/35

C. Screen Analysis 18.03

SIZE	GRAMS	%
2 plus		
2+1 mm	<u>6.31</u>	<u>35.3</u>
1-1/2 mm	<u>2.46</u>	<u>13.8</u>
1/2-1/4 mm	<u>2.72</u>	<u>15.2</u>
1/4-1/8 mm	<u>3.49</u>	<u>19.5</u>
1/8-1/16	<u>2.60</u>	<u>14.5</u>
Pan	<u>.31</u>	<u>1.7</u>
Total	<u>17.89</u>	<u>100.0</u>

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } 1.93 ± Sp. gr. Size-Grade(s) 40 mm.

Analyst D. Frasca

Date 5-2-35

- Wt. of sample 2.65 gm. 100.0%
- Heavy Minerals67 gm. 25.3 %
- Light Minerals 1.98 gm. 74.7 %

Shape Analysis:

A.%: a.%: C.%

r.%: R.%

Minerals Identified:	No. of Grains	Rel. %
Heavy Concentrate		
<u>pyrite</u>	<u>118</u>	<u>99.4</u>
<u>zircon</u>	<u>2</u>	<u>.2</u>
<u>tourmaline brown</u>	<u>2</u>	<u>.2</u>
<u>green</u>		<u>.1</u>
<u>garnet</u>		<u>.1</u>
Total	<u>1224</u>	<u>100%</u>
Light Concentrate		
<u>Clay minerals</u>	<u>336</u>	<u>25.2</u>
<u>quartz</u>	<u>940</u>	<u>71.8</u>
<u>Chert</u>	<u>40</u>	<u>3.0</u>
Total	<u>1336</u>	<u>100%</u>

Classification Grouping:	Absol. %
Primary Minerals: <u>74.9</u> %	
<u>zircon</u>	<u>.1</u>
<u>tourmaline brown</u>	<u>.1</u>
<u>green</u>	<u>0</u>
<u>garnet</u>	<u>0</u>
<u>Clay minerals</u>	<u>18.9</u>
<u>quartz</u>	<u>53.6</u>
<u>Chert</u>	<u>2.2</u>

Secondary Minerals: 25.1 %

pyrite 25.1

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

Sandstone 95% - angular to sub-angular - major grade 1-mm - chief subsidiary 1/2 - 1/8 mm. Siltstone 5%

light to dark gray - non-calcareous - massive. Pyrite 2%

DEEP WELL STUDY

MECHANICAL ANALYSIS

- A. ~~Acid~~ treatment (HCl.....%)
H₂O
1. Sample weight 20.00 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.%

Well No. W— 0.117
 Depth 12.73 1/2 to 12.77 1/2
 No. samples used _____
 Analyst Penne 1
 Date 4/18/35

- B. Subsidiation:
1. Original Wt. 20.00 gm. 100.0%
 2. Cylinder (+1/32) 246.8 19.47 gm. %
 - 2.21
 3. Jar (1/32—1/64)99 gm. %
 - 2.21
 4. Drain 9.4 gm. 2.2 %

C. Screen Analysis 19.49

SIZE	GRAMS	%
2 plus		
2+1 mm	<u>3.57</u>	<u>17.4</u>
1-1/2 mm	<u>2.21</u>	<u>11.3</u>
1/2-1/4 mm	<u>3.14</u>	<u>16.1</u>
1/4-1/8 mm	<u>4.29</u>	<u>22.0</u>
1/8-1/16	<u>5.70</u>	<u>29.2</u>
Pan	<u>.78</u>	<u>4.0</u>
Total	<u>19.49</u>	<u>100.0</u>

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. }
 Bromoform } 2.907 Sp. gr. Size-Grade(s) 1/8- mm.

Analyst D. F. ...
 Date -3-35

Wt. of sample 3.83 gm. 100.0% Shape Analysis:

Heavy Minerals57 gm. 17.6% A. %: a. %: C. %

Light Minerals 2.60 gm. 82.4% r. %: R. %.

Minerals Identified:	No. of Grains	Rel. %	Classification Grouping:	Absol. %
Heavy Concentrate			Primary Minerals: <u>82.5</u> %	
<u>pyrite</u>	<u>173</u>	<u>98.7</u>	<u>zircon</u>	<u>0</u>
<u>sphalerite</u>	<u>6</u>	<u>.5</u>	<u>tourmaline</u>	<u>0</u>
<u>zircon</u>		<u>.2</u>	<u>biotite</u>	<u>.1</u>
<u>tourmaline/green</u>		<u>.2</u>	<u>clay minerals</u>	<u>8.6</u>
<u>biotite</u>			<u>quartz</u>	<u>70.0</u>
			<u>chert</u>	<u>2.6</u>
			<u>feldspar</u>	<u>1.2</u>
Total	<u>108</u>	100%		
Light Concentrate			Secondary Minerals: <u>17.5</u> %	
<u>clay minerals</u>	<u>160</u>	<u>10.4</u>	<u>pyrite</u>	<u>17.4</u>
<u>quartz</u>	<u>1312</u>	<u>85.0</u>	<u>sphalerite</u>	<u>.1</u>
<u>chert</u>	<u>48</u>	<u>3.1</u>		
<u>feldspars</u>	<u>24</u>	<u>1.2</u>		
Total	<u>1544</u>	100%	Total	100%

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

Sandstone - 80% - angular to sub angular major grade
1/8-1/16 mm - chief subsidiary 1/4-1/8 mm. Siltstone 15% -
light to dark gray - non calc. has massive - Pyrite .2%

DEEP WELL STUDY

MECHANICAL ANALYSIS

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

1. Sample weight	20.00 gm.	100.0%	2. Wt. of F. P.	
3. Wt. after solution, with filter paper	18.21 gm.			
4. Less wt. F. P. (2)	1.79 gm.			
5. Wt. Insol. Residue (3 minus 4)	16.42 gm.	82.1%		
6. Wt. lost by solution (1 minus 5)	3.58 gm.	17.9%		
7. To balance (5 plus 6)	20.00 gm.	100.0%		

B. Subsidiary:

1. Original Wt.	19.21 gm.	100.0%
2. Cylinder (+1/32)	1.39 gm.	5.9%
3. Jar (1/32-1/64)	0.51 gm.	2.6%
4. Drain	5.31 gm.	27.7%

Well No. W- 0117
 Depth 1277 1/2 to 1281 1/2
 No. samples used 1
 Analyst Pennel
 Date 7/18/35

C. Screen Analysis 11.18

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm	5.27	47.8
1/2-1/4 mm		
1/4-1/8 mm	5.84	52.5
1/8-1/16		
Pan		
Total	11.11	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. }
 Bromoform } 2.93 ± Sp. gr. Size-Grade(s) 1/2 - Pan mm.

Analyst D. Frische
 Date 5-3-35

Wt. of sample 3.09 gm. 100.0%

Shape Analysis:

Heavy Minerals 0.095 gm. 3.1 %

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

Light Minerals 2.995 gm. 96.9 %

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

Minerals Identified:

Heavy Concentrate	No. of Grains	Rel. %
pyrite	1290	98.5
zircon	10	.8
tourmaline-green	5	.4
leucosene-blue	7	.1
amphibole		
muscovite		
Total	130	100%

Classification Grouping:

Primary Minerals:	Absol. %
96.9 %	
zircon	0
tourmaline-green	0
blue	0
quartz	40.3
amphibole	0
muscovite	0
clay minerals	56.6

Light Concentrate	No. of Grains	Rel. %
quartz	1600	41.6
clay minerals	2240	58.4
muscovite	3	0

Secondary Minerals:	Absol. %
3.1 %	
pyrite	3.1
leucosene	0

Total 3843 100%

Total 100%

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

Shale 76 medium gray massive sandstone
70% angular-subangular medium grade 1/4-1/8-
chief sub-s- 2-1/4 mm. mica-pyrite present

DEEP WELL STUDY

MECHANICAL ANALYSIS

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

1. Sample weight	20.00 gm.	100.0%	2. Wt. of F. P.
3. Wt. after solution, with filter paper	20.05 gm.		
4. Less wt. F. P. (2)			
5. Wt. Insol. Residue (3 minus 4)	0.05 gm.	9.2%	
6. Wt. lost by solution (1 minus 5)	1.95 gm.	9.3%	
7. To balance (5 plus 6)	20.00 gm.	100.0%	

Well No. W- 0117
 Depth 1281 1/2 to 1284 1/2
 No. samples used 1
 Analyst Pennel
 Date 4/18/35

B. Subsidiation:

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

C. Screen Analysis 18.00

SIZE	GRAMS	%
2 plus		
4+1 mm	.38	2.1
1-1/2 mm	1.53	8.5
1/2-1/4 mm	3.15	17.5
1/4-1/8 mm	3.35	18.6
1/8-1/16	6.77	37.5
Pan	2.85	15.8
Total	18.03	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } 2.92± Sp. gr. Size-Grade(s) 18 1/16 mm.

Analyst KUNDERT
 Date MAY 2, 1935

Wt. of sample	3.10 gm.	100.0%
Heavy Minerals . . . . .	.67 gm.	21.6%
Light Minerals	2.43 gm.	78.4%

Shape Analysis:

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

Minerals Identified:

No. of Grains

Rel. %

Classification Grouping:

Absol. %

Heavy Concentrate

Pyrrite	480	45.9
Zircon-Unzoned	3	.1
Jourmaline-Green	1	.0
Sphalerite	3	.1
Clay Minerals	1100	51.6
Leucoxene	50	2.3
Total	2137	100%

Primary Minerals:

Zircons-Unzoned		
Jourmaline-Green		
Clay Minerals		12.8
Feldspars		0.2
Quartz		62.5
Muscovite		0.2
Total	75.7%	

Light Concentrate

Chert	150	3.3
Clay Minerals	250	16.3
Feldspar	4	.3
Glaucouite	1	.1
Muscovite	3	.2
Quartz	1225	79.8
Total	1533	100%

Secondary Minerals:

Pyrrite		9.9
Sphalerite		
Leucoxene		0.5
Chert		0.6
Glaucouite		0.1
Clay Min.		11.2
Total	24.3%	100%

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

Ss. 70-80% A to a; major grade 1/8-1/16; principal sub 1/4-1/8;
 sls. 10-20% light to dark gray, non-calcareous, massive;
 shale 1-5% carboniferous, fine; 8%± pyrite

DEEP WELL STUDY

MECHANICAL ANALYSIS

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

- ^{H₂O}
- Sample weight 20.00 gm. 100.0%: F. P. _____
 - Wt. after solution, with filter paper _____ gm.
 - Less wt. F. P. (2) _____ gm.
 - Wt. Insol. Residue (3 minus 4) _____ gm.%
 - Wt. lost by solution (1 minus 5) _____ gm.%
 - To balance (5 plus 6) _____ gm.%

Well No. W- 0117
 Depth 1284 1/2 to 1296 1/2
 No. samples used 3
 Analyst Pennel
 Date 4/18/35

B. Subsidiation:

- Original Wt. 20.00 gm. 100.0%
- Cylinder (+1/32) 19.51 gm. 97.6%
- Jar (1/32—1/64)08 gm.4%
- Drain41 gm. 2.0%

C. Screen Analysis 19.50

SIZE	GRAMS	%
2 plus		
4+1 mm	<u>.49</u>	<u>2.5</u>
1-1/2 mm	<u>1.21</u>	<u>6.2</u>
1/2-1/4 mm	<u>3.18</u>	<u>16.3</u>
1/4-1/8 mm	<u>4.87</u>	<u>25.0</u>
1/8-1/16	<u>8.30</u>	<u>42.6</u>
Pan	<u>.44</u>	<u>2.4</u>
Total	<u>19.49</u>	<u>100.0</u>

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. } 2.931 Sp. gr. Size-Grade(s) 1/8-1/16 mm.
 Bromoform }

Analyst KUNDERT
 Date MAY 3, 1935

- Wt. of sample 2.98 gm. 100.0%
 Heavy Minerals33 gm. 11%
 Light Minerals 2.65 gm. 89%

Shape Analysis:

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

Minerals Identified:

No. of Grains	Rel. %
2000	95.0
23	1.1
3	0.1
2	0.1
1	0.0
20	1.0
55	2.6
Total	2104 100%

Classification Grouping:

Primary Minerals:	Absol. %
Zircos-Unzoned	
Tourmaline-Green	
Clay Minerals	<u>15.8</u>
Quartz	<u>70.7</u>
Muscovite	<u>0.2</u>
Feldspar	<u>0.3</u>
Total	100%

Heavy Concentrate

- Pyrite
- Zircos-Unzoned
- Tourmaline-Green
- " - Brown
- Sphalerite
- Leucosene
- Clay Aggregates

Total 2104 100%

Light Concentrate

- Chert
- Clay Minerals
- Feldspar
- Muscovite
- Quartz

110	4.2
450	17.3
7	0.3
3	0.2
2025	78.0
Total	2597 100%

Secondary Minerals: 13.0%

Sphalerite	
Pyrite	<u>8.9</u>
Leucosene	<u>0.1</u>
Chert	<u>3.8</u>
Clay Agg.	<u>0.2</u>
Total	100%

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

ss. 70-80% A to a; major grade 1/8-1/16, prin subsidiary 1/4-1/8; siltstone 10%+ buff non-calcareous, firm, massive; shale 15%+ black, fissile, pyrite + 7% —

DEEP WELL STUDY

MECHANICAL ANALYSIS

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

1. Sample weight 20.00 gm. 100.0%: F. P. _____
2. Wt. of _____
3. Wt. after solution, with filter paper 20.03 gm.
4. Less wt. F. P. (2) 0.03 gm.
5. Wt. Insol. Residue (3 minus 4) 17.59 gm. 87.9%
6. Wt. lost by solution (1 minus 5) 2.41 gm. 12.1%
7. To balance (5 plus 6) 20.00 gm. 100.0%

Well No. W- 0117

Depth 1296 1/2 to 1301 1/2

No. samples used 1

Analyst Pennel

Date 4/18/35

B. Subsidiation:

1. Original Wt. 17.59 gm. 100.0%
2. Cylinder (+1/32) 2.34 gm. 66.0%
3. Jar (1/32—1/64) 2.05 gm. 15.8%
4. Drain 1.21 gm. 18.2%

C. Screen Analysis 11.36

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm	<u>74.86</u>	<u>42.9</u>
1/2-1/4 mm		
1/4-1/8 mm		
1/8-1/16	<u>6.46</u>	<u>57.1</u>
Pan		
Total	<u>11.32</u>	<u>100.0</u>

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. }
 Bromoform } Sp. gr. _____ Size-Grade(s) Pan mm.

Analyst D. Frasca

Date 5-6-35

Wt. of sample 3.08 gm. 100.0%

Shape Analysis:

Heavy Minerals06 gm. 1.9%

A.%: a.%: C.%

Light Minerals 3.02 gm. 98.1%

r.%: R.%

Minerals Identified:
 Heavy Concentrate

No. of Grains Rel. %

Classification Grouping:
 Primary Minerals: 98.2%

Absol. %

<u>pyrite</u>	<u>1360</u>	<u>97.4</u>	<u>pyrite</u>	<u>0</u>
<u>zircon</u>	<u>18</u>	<u>1.3</u>	<u>tourmaline</u>	<u>0</u>
<u>tourmaline green</u>	<u>2</u>	<u>.1</u>	<u>quartz</u>	<u>13.6</u>
<u>leucosene</u>	<u>17</u>	<u>1.2</u>	<u>clay minerals</u>	<u>84.6</u>

Total 159 100%

Light Concentrate

Secondary Minerals: 1.8%

<u>quartz</u>	<u>243</u>	<u>13.8</u>	<u>pyrite</u>	<u>1.8</u>
<u>clay minerals</u>	<u>1527</u>	<u>86.2</u>	<u>leucosene</u>	<u>0</u>

Total 1770 100% Total 100%

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

Siltstone 87% light to dark gray; unmassive-non calcareous

Sandstone 13% - angular to sub angular - major grade 2-1/4 mm

chief subsidiary 1/4-1/8 mm. Pyrite - minor trace

DEEP WELL STUDY

MECHANICAL ANALYSIS

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

- | | | | | |
|--|-----------|--------|-----------------|--|
| 1. Sample weight | 20.00 gm. | 100.0% | 2. Wt. of F. P. | |
| 3. Wt. after solution, with filter paper | 18.18 gm. | | | |
| 4. Less wt. F. P. (2) | 2.33 gm. | | | |
| 5. Wt. Insol. Residue (3 minus 4) | 5.81 gm. | 77.1% | | |
| 6. Wt. lost by solution (1 minus 5) | 7.19 gm. | 22.9% | | |
| 7. To balance (5 plus 6) | 20.00 gm. | 100.0% | | |

B. Subsidiation:

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

Well No. W— 0117
 Depth 1301 1/2 to 1306 1/2
 No. samples used 1
 Analyst Pannel
 Date 4/19/35

C. Screen Analysis 15.70

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm	4.86	31.3
1/2-1/4 mm		
1/4-1/8 mm	2.09	13.5
1/8-1/16	5.61	36.2
Pan	2.94	19.0
Total	15.50	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform { 2.93± Sp. gr. Size-Grade(s) 1/2-Pan mm.

Analyst D. Frische
 Date -6-35

Wt. of sample 3.39 gm. 100.0%
 Heavy Minerals .21 gm. 6.2%
 Light Minerals 3.18 gm. 93.8%

Shape Analysis:

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

Minerals Identified; Heavy Concentrate

No. of Grains	Rel. %
1296	96.3
10	.7
2	.1
2	.1
2	.1
35	2.6
1	.1
Total	1348 100%

Classification Grouping:

Primary Minerals:	Absol. %
93.8%	
Zircon	
tourmaline-green	
brown	
garnet	
rutile	
feldspar	4.2
clay-minerals	27.2
quartz	60.5
Chert	1.9

Secondary Minerals: 6.2%
 Pyrite 6.0
 leucocoxene .2

Light Concentrate
 feldspar 56 4.5
 clay-minerals 360 29.0
 quartz 800 69.5
 Chert 24 2.0

Total 1340 100% Total 100%

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

Feldspar 59%: angular to subangular - major grade 1/8 - 1/4 mm
 chief subsidiary 2-1/4 mm. Shale 30% black to light gray to dark gray - black - non-cal. fissile - Pyrite - muscovite - feldspar - lost by solution 20%.

DEEP WELL STUDY

MECHANICAL ANALYSIS

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

1. Sample weight	20.00 gm.	100.0%	2. Wt. of F. P.
3. Wt. after solution, with filter paper	17.51 gm.		
4. Less wt. F. P. (2)	2.38 gm.		
5. Wt. Insol. Residue (3 minus 4)	16.63 gm.	83.2%	
6. Wt. lost by solution (1 minus 5)	2.87 gm.	14.3%	
7. To balance (5 plus 6)	20.00 gm.	100.0%	

Well No. W- 0117
 Depth 1306 1/2 to 1311 1/2
 No. samples used 1
 Analyst Pennel
 Date 4/18/35

B. Subsidiary:

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

C. Screen Analysis 17.02

SIZE	GRAMS	%
2 plus		
2+1 mm	1.75	10.4
1-1/2 mm	1.33	7.9
1/2-1/4 mm	1.17	7.0
1/4-1/8 mm	1.05	6.2
1/8-1/16	8.91	52.9
Pan	2.63	15.6
Total	16.94	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

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

Wt. of sample 3.15 gm. 100.0%

Shape Analysis:

Heavy Minerals .10 gm. 3.2%

A. %: a. %: C. %

Light Minerals 3.05 gm. 96.8%

r. %: R. %

Minerals Identified:

Heavy Concentrate

Mineral	No. of Grains	Rel. %
pyrite	1020	97.8
zircon	5	.3
tourmaline-brown-1		.1
green-9		.5
leucosene	21	.3
Total	165	100%

Classification Grouping:

Primary Minerals:	Absol. %
zircon	0
tourmaline brown	0
green	0
chert	14
clay-minerals	40
quartz	90.0
feldspars	1.5

Secondary Minerals: 3.1 %

pyrite	3.1
leucosene	0

Total 2930 100%

Total 100%

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

Sandstone 92% Angular to sub-angular - major grade 1/8-1/16 mm
 chief subsidiary 1/16-1/32 - siltstone 70% buff and light to dark
 gray - massive - iron-calc. Shale 5% black carbonaceous
 fissit - wt lost by solution 14%

Analyst D. Frasché
 Date 5-6-35

DEEP WELL STUDY

MECHANICAL ANALYSIS

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

1. Sample weight	20.00 gm.	100.0%	2. Wt. of F. P.
3. Wt. after solution, with filter paper	17.74 gm.		
4. Less wt. F. P. (2)	10 gm.		
5. Wt. Insol. Residue (3 minus 4)	17.74 gm.	88.7%	
6. Wt. lost by solution (1 minus 5)	2.26 gm.	11.3%	
7. To balance (5 plus 6)	20.00 gm.	100.0%	

Well No. W— 0117
 Depth 13.11 1/2 to 13.16 1/2
 No. samples used 1
 Analyst Pennel
 Date 4/18/35

B. Subsidiation:

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

C. Screen Analysis 17.47

SIZE	GRAMS	%
2 plus		
3/4 mm	3.70	21.4
1-1/2 mm	2.42	14.0
1/2-1/4 mm	1.90	11.0
1/4-1/8 mm	1.62	9.4
1/8-1/16	5.35	31.0
Pan	2.27	13.2
Total	17.26	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

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

Wt. of sample	3.35 gm.	100.0%
Heavy Minerals	.15 gm.	4.5%
Light Minerals	3.20 gm.	95.5%

Shape Analysis:

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

Minerals Identified: Heavy Concentrate

pyrite
 zircon
 tourmaline-green
 blue-brown
 garnet
 leucocene

No. of Grains	Rel. %
15	16.7
7	1.0
1	0.5
3	.1
2	.2
2	.1
2	1.4
Total	144

Classification Grouping:

Primary Minerals:	95.5%	Absol. %
zircon		0
tourmaline-green		0
blue		0
brown		0
garnet		0
feldspars		2.1
muscovite		.1
chlorite		1.5
clay-minerals		18.3
quartz		73.5

Total 144 100%

Light Concentrate

feldspar	56	2.2
muscovite	3	.1
chlorite	40	1.6
clay-minerals	480	19.2
quartz	1920	76.9
Total	2499	100%

Secondary Minerals: 4.5%

pyrite	4.4
leucocene	.1

Total 2499 100%

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

Sandstone 70% Angular to sub-angular - major grade
 1/8-1/16 - chief sub-sidiary + 1 mm. Siltsand 15% - buff to light
 gray-shale 5% dark gray to black. Pyrite mica present
 Wt. lost by solution 11%

Analyst D. Frascchi
 Date 5-6-35

DEEP WELL STUDY

MECHANICAL ANALYSIS

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

1. Sample weight 20.00 gm. 100.0% : 2. Wt. of F. P. _____
3. Wt. after solution, with filter paper 19.75 gm.
4. Less wt. F. P. (2) 2.31 gm.
5. Wt. Insol. Residue (3 minus 4) 1.744 gm. 8.72 %
6. Wt. lost by solution (1 minus 5) 2.56 gm. 12.8 %
7. To balance (5 plus 6) 20.00 gm. 100.0 %

B. Subsidiary:

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

Well No. W— 0112

Depth 1325 1/2 to 1335 1/2

No. samples used 2

Analyst Pennel

Date 4/18/35

C. Screen Analysis 11/12

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm	<u>76.05</u>	<u>34.8</u>
1/2-1/4 mm		
1/4-1/8 mm	<u>2.31</u>	<u>13.3</u>
1/8-1/16	<u>5.14</u>	<u>29.6</u>
Pan	<u>3.86</u>	<u>21.3</u>
Total	<u>17.36</u>	<u>100.0</u>

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } 2.93± Sp. gr. Size-Grade(s) 1/8-1/2 mm.

Analyst D. Frascó

Date MAY 6, 1935

Wt. of sample 3.40 gm. 100.0%

Shape Analysis:

Heavy Minerals20 gm. 5.9 %

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

Light Minerals 3.20 gm. 94.1 %

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

Minerals Identified:

No. of Grains

Rel. %

Classification Grouping:

Absol. %

Primary Minerals: 94.1 %

pyrite

Zircon

tourmaline-green

blue

brown

leucorhene

hematite

1408 9.5

4 1.3

3 .2

2 .1

1 .1

9 .6

17 5.2

Zircon 0

tourmaline-green-3 0

blue-2 0

brown-1 0

feldspar 1.7

Clay-minerals 12.0

quartz 64.9

Chert 17.5

Total 100%

Light Concentrate

feldspar 40 11.8

Clay-minerals 273 12.5

quartz 1480 67.5

Chert 400 18.2

Secondary Minerals: 5.9 %

pyrite 5.8

leucorhene 0

hematite .1

Total 2193 100%

Total 100%

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

sandstone 95% - angular to sub-angular major grade

1/8-1/16 mm - chief sub-sidiary - 1/4-1/8 mm. Siltstone 10% buff to

dark-light gray - firm massive. Shale 5% black man-

calce-carb fissile - lost by solution 12%.

DEEP WELL STUDY

MECHANICAL ANALYSIS

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

1. Sample weight 20.00 gm. 100.0%: 2. Wt. of F. P. _____
3. Wt. after solution, with filter paper 19.07 gm.
4. Less wt. F. P. (2)51 gm.
5. Wt. Insol. Residue (3 minus 4) 16.56 gm. 82.8 %
6. Wt. lost by solution (1 minus 5)44 gm. 2.2 %
7. To balance (5 plus 6) 20.00 gm. 100.0 %

Well No. W- 0117
 Depth 1335 1/2 to 1345 1/2
 No. samples used 2
 Analyst Pennel
 Date 4/18/35

B. Subsidiation:

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

C. Screen Analysis 16.41

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm	<u>6.96</u>	<u>42.4</u>
1/2-1/4 mm		
1/4-1/8 mm	<u>2.62</u>	<u>16.0</u>
1/8-1/16	<u>4.20</u>	<u>25.6</u>
Pan	<u>2.63</u>	<u>16.0</u>
Total	<u>16.41</u>	<u>100.0</u>

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 D. Frascò
 Date 4-35

Wt. of sample 3.25 gm. 100.0% Shape Analysis:

Heavy Minerals20 gm. 6.1 % A. %: a. %: C. %

Light Minerals 3.05 gm. 93.9 % r %: R %.

Minerals Identified:	No. of Grains	Rel. %	Classification Grouping:	Absol. %
Heavy Concentrate			Primary Minerals: <u>93.9</u> %	
<u>pyrite</u>	<u>352</u>	<u>97.3</u>	<u>tourmaline-green</u>	
<u>tourmaline-green</u>	<u>2</u>	<u>.1</u>	<u>Chert</u>	<u>19.2</u>
<u>leucocane</u>	<u>17</u>	<u>1.2</u>	<u>Clay minerals</u>	<u>11.2</u>
<u>hematite</u>	<u>20</u>	<u>1.4</u>	<u>quartz</u>	<u>62.0</u>
			<u>calcite</u>	<u>0.5</u>

Total 39 100%

Light Concentrate	No. of Grains	Rel. %	Secondary Minerals: <u>6.1</u> %	Absol. %
<u>Chert</u>	<u>140</u>	<u>16.2</u>	<u>pyrite</u>	<u>5.9</u>
<u>Clay minerals</u>	<u>176</u>	<u>11.9</u>	<u>leucocane</u>	<u>0.1</u>
<u>quartz</u>	<u>1060</u>	<u>71.4</u>	<u>hematite</u>	<u>0.1</u>
<u>feldspars</u>	<u>7</u>	<u>.5</u>		

Total 1483 100% Total 100%

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

Sandstone 70%: angular to subangular - major grade
4-1/16 mm - chief, sub-sidiary 1/4 - 1/8 mm siltstone 18%
light to dark gray - non calc. massive - shale 4% black carb
- 20% calc. fossil - lost by solution - 17%

DEEP WELL STUDY

MECHANICAL ANALYSIS

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

1. Sample weight 20.00 gm. 100.0%: 2. Wt. of F. P. _____
3. Wt. after solution, with filter paper 20.00 gm.
4. Less wt. F. P. (2) 0.05 gm.
5. Wt. Insol. Residue (3 minus 4) 17.36 gm. 86.8 %
6. Wt. lost by solution (1 minus 5) 2.64 gm. 13.2 %
7. To balance (5 plus 6) 20.00 gm. 100.0 %

B. Subsidiation:

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

Well No. W— 0.117

Depth 1345 1/2 to 1350 1/2

No. samples used 1

Analyst Pennel

Date 4/18/35

C. Screen Analysis 18.03

SIZE	GRAMS	%
2 plus		
2 +1 mm		
1-1/2 mm	<u>77.96</u>	<u>10.9</u>
1/2-1/4 mm		
1/4-1/8 mm	<u>8.98</u>	<u>47.2</u>
1/8-1/16	<u>5.18</u>	<u>28.9</u>
Pan	<u>2.36</u>	<u>13.1</u>
Total	<u>17.98</u>	<u>100.0</u>

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } 2.98 ± Sp. gr. Size-Grade(s) 3-4 mm.

Analyst D. Frasca

Date 5-6-35

- Wt. of sample 3.21 gm. 100.0%
- Heavy Minerals 0.09 gm. 2.8 %
- Light Minerals gm. 97.2 %

Shape Analysis:

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

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

Minerals Identified:

No. of Grains

Rel. %

Classification Grouping:

Absol. %

pyrite

zircon

tourmaline-green

 brown

 pink

leucosene

1216

19

3

5

3

21

96.0

1.5

0.2

0.4

0.2

1.7

zircon

tourmaline-green

 brown

 pink

feldspar

quartz

clay minerals

chert

0.4

75.7

15.2

6.0

Total 126 100%

Light Concentrate

feldspar

quartz

clay minerals

chert

1600

320

128

.4

77.8

15.6

6.2

Secondary Minerals: 2.1 %

pyrite

leucosene

2.7

Total 1056 100%

Total

100%

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

Sandstone 70% - angular to sub-angular - 20 mesh grade

1/4-1/8 - chief subsidiary - 1/8-1/16 - max grade - 2nd mesh - silt stand

15% - light to dark gray - iron calc - massive - pyrite

present - weight lost by solution 13%

DEEP WELL STUDY

MECHANICAL ANALYSIS

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

1. Sample weight 20.00 gm. 100.0%: F. P. _____
2. Wt. of _____
3. Wt. after solution, with filter paper 21.39 gm.
4. Less wt. F. P. (2) _____ gm.
5. Wt. Insol. Residue (3 minus 4) 19.08 gm. 95.4%
6. Wt. lost by solution (1 minus 5) 9.2 gm. 4.6%
7. To balance (5 plus 6) 20.00 gm. 100.0%

Well No. W- 0117

Depth 1350 1/2 to 1357

No. samples used 2

Analyst Pennel

Date 4/14/35

B. Subsidiation:

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

C. Screen Analysis 18.60

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm	<u>2.57</u>	<u>13.9</u>
1/2-1/4 mm		
1/4-1/8 mm	<u>10.50</u>	<u>56.9</u>
1/8-1/16	<u>4.39</u>	<u>23.8</u>
Pan	<u>1.00</u>	<u>5.4</u>
Total	<u>18.46</u>	<u>100.0</u>

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform- { 2.93 ± Sp. gr. Size-Grade(s) 12-11 mm.

Analyst KUNDERT

Date MAY 7, 1935

Wt. of sample 3.02 gm. 100.0% Shape Analysis:

Heavy Minerals09 gm. 3% A.....%: a.....%: C.....%

Light Minerals 2.93 gm. 97% r.....%: R.....%

Minerals Identified:

Heavy Concentrate

Minerals Identified:	No. of Grains	Rel. %
Pyrite	1080	19.4
Zircon-Unzoned	181	13.3
Tourmaline-Green	9	0.7
" - Brown	15	1.1
" - Blue	1	0.0
Leptaxene	25	1.8
Chlorite	1	0.0
Scale	20	1.5
Clay Aggregates	30	2.2
Total	1362	100%

Classification Grouping:

Primary Minerals: 90.9% Absol. %

Zircon-Unzoned	<u>.4</u>
Tourmaline-Green	
" - Brown	
" - Blue	
Clay Aggregates (Minerals)	<u>3.7</u>
Quartz	<u>83.8</u>
Feldspar	<u>2.0</u>

Light Concentrate

Chert	50	6.2
Clay Minerals	30	3.7
Feldspars	25	3.1
Muscovite	5	0.6
Quartz	700	86.4
Total	810	100%

Secondary Minerals: 9.1%

Pyrite	<u>2.4</u>
Leptaxene	
Chlorite	
Scale	
Chert	<u>6.1</u>
Muscovite	<u>0.6</u>
Clay Aggregates	
Total	100%

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

ss 70% ± A to a; major grade 1/4-1/8; 1/8-1/16 principal subsidiary;
sls 30% ± brown + dark gray, non-calcareous, massive -
2% ± pyrite -

DEEP WELL STUDY

MECHANICAL ANALYSIS

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

1. Sample weight	20.00 gm.	100.0%	2. Wt. of F. P.	
3. Wt. after solution, with filter paper	16.71 gm.			
4. Less wt. F. P. (2)	3.29 gm.			
5. Wt. Insol. Residue (3 minus 4)	13.42 gm.	67.1%		
6. Wt. lost by solution (1 minus 5)	6.58 gm.	32.9%		
7. To balance (5 plus 6)	20.00 gm.	100.0%		

B. Subsidiation:

1. Original Wt.	16.21 gm.	100.0%
2. Cylinder (+1/32)	2.29 gm.	14.1%
3. Jar (1/32-1/64)	16.2 gm.	100.0%
4. Drain	2.29 gm.	14.1%

Well No. W- 0117
 Depth 1357 to 1366
 No. samples used 4
 Analyst Pennel
 Date 4/18/35

C. Screen Analysis 11.48

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm	4.74	41.3
1/2-1/4 mm		
1/4-1/8 mm		
1/8-1/16	7.73	67.7
Pan		
Total	11.47	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } 2.93 Sp. gr. Size-Grade(s) 1/4 Pan mm.

Analyst KONDERT
 Date MAY 8, 1935

Wt. of sample	3.13 gm.	100.0%
Heavy Minerals	.07 gm.	2.2%
Light Minerals	3.06 gm.	97.8%

Shape Analysis:

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

Minerals Identified:

Heavy Concentrate

Purite
 Zircon-Unzoned
 Tourmaline-Brown
 -Green
 Leucoxene
 Clay Aggregates

No. of Grains	Rel. %
120	91.7
40	2.9
5	0.4
3	0.2
10	1.2
50	3.6

Classification Grouping:

Primary Minerals:	96.4%	Absol. %
Zircon-Unzoned		
Tourmaline-Brown		
-Green		
Clay Minerals		23.9
Quartz		71.7
Feldspars		0.8

Total 1384 100%

Light Concentrate

Chert
 Clay Minerals
 Feldspar
 Muscovite
 Quartz

No. of Grains	Rel. %
10	0.8
300	24.4
10	0.8
10	0.8
900	73.2

Secondary Minerals: 2.6%

Purite	2.0
Leucoxene	
Chert	0.8
Muscovite	0.8
Clay Agg.	
Total	100%

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

sls; 600+ buff and light to dark gray, non-schistose, firm, massive; shale 300+ gray, soft, ductuous, major grade 1/2-1/4; principal subsidiary 1/4-1/8, purite > 10%

DEEP WELL STUDY

MECHANICAL ANALYSIS

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

1. Sample weight 20.00 gm. 100.0% : 2. Wt. of F. P. _____
3. Wt. after solution, with filter paper 20.05 gm.
4. Less wt. F. P. (2) 2.45 gm.
5. Wt. Insol. Residue (3 minus 4) 7.60 gm. 88.0 %
6. Wt. lost by solution (1 minus 5) 2.40 gm. 12.0 %
7. To balance (5 plus 6) 20.00 gm. 100.0 %

B. Subsidiation:

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

Well No. W- 0117

Depth 1366 to 1378 1/2

No. samples used 3

Analyst Penne!

Date 4/18/35

C. Screen Analysis 17.49

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm	<u>8.1</u>	<u>39.0</u>
1/2-1/4 mm		
1/4-1/8 mm	<u>6.42</u>	<u>36.8</u>
1/8-1/16	<u>3.68</u>	<u>21.1</u>
Pan	<u>.55</u>	<u>3.1</u>
Total	<u>7.40</u>	<u>100.0</u>

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } 1.935 Sp. gr. Size-Grade(s) 18-116 mm.

Analyst KUDBERT

Date MAY 8, 1935

Wt. of sample 3.64 gm. 100.0% Shape Analysis:

Heavy Minerals12 gm. 3.4 % A. %: a. %: C. %

Light Minerals 3.52 gm. 96.6 % r %: R %

Minerals Identified: No. of Grains Rel. % Classification Grouping: Absol. %

Minerals Identified:	No. of Grains	Rel. %	Classification Grouping:	Absol. %
Heavy Concentrate			Primary Minerals: <u>92.8</u> %	
Pyrite	<u>1550</u>	<u>85.4</u>	Zircon-Unzoned	<u>0.2</u>
Zircon-Unzoned	<u>91</u>	<u>5.0</u>	Tourmaline-Green	
Tourmaline-Green	<u>6</u>	<u>0.3</u>	" - Brown	
" - Brown	<u>10</u>	<u>0.6</u>	Clay Minerals	<u>18.8</u>
Leucoxene	<u>32</u>	<u>1.8</u>	Quartz	<u>73.2</u>
Clay Aggregates	<u>125</u>	<u>6.9</u>	Feldspar	<u>0.6</u>
Total	<u>1814</u>	<u>100%</u>		

Light Concentrate	No. of Grains	Rel. %	Secondary Minerals:	Absol. %
Chert	<u>20</u>	<u>3.9</u>	Leucoxene	
Clay Minerals	<u>450</u>	<u>19.5</u>	Pyrite	<u>0.19</u>
Feldspar	<u>12</u>	<u>0.7</u>	Chert	<u>0.1</u>
Muscovite	<u>3</u>	<u>0.2</u>	Muscovite	<u>0.2</u>
Quartz	<u>1750</u>	<u>75.8</u>	Clay Agg.	<u>0.2</u>
Total	<u>2310</u>	<u>100%</u>	Total	<u>100%</u>

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

ss 60% at A to C, major grade 1/4-1/8, prim sub 1/2-1/4;

sls 30% at buff and light to dark gray, non-calcareous,

thinly laminated fine: pyrite 2% at

DEEP WELL STUDY

MECHANICAL ANALYSIS

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

1. Sample weight 20.00 gm. 100.0% : 2. Wt. of F. P. _____
3. Wt. after solution, with filter paper 11.87 gm.
4. Less wt. F. P. (2) 2.99 gm.
5. Wt. Insol. Residue (3 minus 4) 15.10 gm. 75.5%
6. Wt. lost by solution (1 minus 5) 9.0 gm. 24.5%
7. To balance (5 plus 6) 20.0 gm. 100.0%

Well No. W- 0117
 Depth 13.78 1/2 to 13.91 1/2
 No. samples used 3
 Analyst Pennel
 Date 4/18/35

B. Subsidiary:

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

C. Screen Analysis 15.04

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm	<u>74.56</u>	<u>30.5</u>
1/2-1/4 mm		
1/4-1/8 mm	<u>5.18</u>	<u>34.7</u>
1/8-1/16	<u>4.19</u>	<u>28.0</u>
Pan	<u>1.01</u>	<u>6.5</u>
Total	<u>84.94</u>	<u>100.0</u>

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. }
 Bromoform } Sp. gr. _____ Size-Grade(s) 1/2-1/16 mm.

Analyst KUNDERT
 Date MAY 8, 1935

Wt. of sample 3.85 gm. 100.0% Shape Analysis:

Heavy Minerals12 gm. 3.2% A. _____ %: a. _____ %: C. _____ %

Light Minerals 3.73 gm. 96.8% r. _____ %: R. _____ %.

Minerals Identified: No. of Grains Rel. % Classification Grouping: Absol. %

Heavy Concentrate

Minerals Identified:	No. of Grains	Rel. %	Classification Grouping:	Absol. %
Pyrite	3000	89.9	Zircon-Unzoned	0.1
Zircon-Unzoned	94	2.5	Tourmaline - Pink	
Tourmaline - Pink	2	0.1	" - Green	
" - Green	10	0.3	" - Brown	
" - Brown	10	0.3	Clay Minerals	30.4
Leucopene	29	0.8	Quartz	60.4
Sphalerite	2	0.1	Feldspar	0.7
Clay Aggregates	200	6.0		
Total	3344	100%	Primary Minerals: <u>91.6%</u>	

Light Concentrate

Minerals Identified:	No. of Grains	Rel. %	Classification Grouping:	Absol. %
Chert	110	5.3	Sphalerite	
Clay Minerals	652	31.4	Leucopene	0.9
Feldspar	15	0.7	Pyrite	5.1
Muscovite	5	0.2	Chert	0.2
Quartz	1290	62.4	Muscovite	0.2
Total	2072	100%	Total Clay Agg. <u>3.4%</u>	100%

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

ss 60% ± A to a major grade 1/4-1/8, principal subsidiary 1/8-1/16
sls 30% ± Thinly laminated, firm, fossiliferous -
pyrite 20% ±

DEEP WELL STUDY

MECHANICAL ANALYSIS

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

1. Sample weight	20.00 gm.	100.0%	2. Wt. of F. P.	
3. Wt. after solution, with filter paper	1.60 gm.			
4. Less wt. F. P. (2)				
5. Wt. Insol. Residue (3 minus 4)	12.40 gm.	62.0%		
6. Wt. lost by solution (1 minus 5)	7.60 gm.	38.0%		
7. To balance (5 plus 6)	20.00 gm.	100.0%		

B. Subsidiary:

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

Well No. W- 0117
 Depth 1394 to 1396 1/2
 No. samples used 1
 Analyst Pennel
 Date 4/18/35

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm	5.40	44.7
1/2-1/4 mm		
1/4-1/8 mm	3.21	26.6
1/8-1/16	2.90	24.0
Pan	.57	4.7
Total	12.08	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. }
 Bromoform } Sp. gr. Size-Grade(s) 18-1/16 mm.

Analyst KUNDELT
 Date MAY 9 1935

Wt. of sample 2.93 gm. 100.0%

Shape Analysis:

Heavy Minerals .10 gm. 3.4%

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

Light Minerals 2.83 gm. 96.6%

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

Minerals Identified; Heavy Concentrate

No. of Grains	Rel. %
1383	90.7
33	2.0
4	0.3
5	0.3
16	1.1
86	5.6
Total	1527 100%

Classification Grouping:

Primary Minerals:	Absol. %
Zircon-Uxozoned	0.1
Tourmaline-Green	
" -Brown	
Clay Minerals	30.7
Quartz	62.4
Feldspars	0.5

Light Concentrate

No. of Grains	Rel. %
35	2.8
400	31.8
9	0.5
4	0.3
815	64.6
Total	1260 100%

Secondary Minerals: 6.3%

Leucopxene	
Pyrrite	3.1
Chert	2.7
Muscovite	0.3
Clay Agg	0.2
Total	100%

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

ss. 60% + A to a, major grade 1/4-1/8, principal subsidiary 1/8-1/16;
 sls 30% + dark grey non-calcareous, thinly laminated; limestone
 10% + buff, finely crystalline; pyrite > 1% -

DEEP WELL STUDY

MECHANICAL ANALYSIS

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

1. Sample weight	20.00 gm.	100.0%	2. Wt. of F. P.	
3. Wt. after solution, with filter paper	15.46 gm.			
4. Less wt. F. P. (2)	2.03 gm.			
5. Wt. Insol. Residue (3 minus 4)	13.43 gm.	67.2%		
6. Wt. lost by solution (1 minus 5)	6.57 gm.	32.8%		
7. To balance (5 plus 6)	20.00 gm.	100.0%		

Well No. W- 0117
 Depth 1396 1/2 to 1401 1/2
 No. samples used 1
 Analyst Pennel
 Date 4/18/35

C. Screen Analysis 3.41

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm	8.50	64.9
1/2-1/4 mm		
1/4-1/8 mm	2.67	20.4
1/8-1/16	1.45	11.1
Pan	.41	3.6
Total	13.09	100.0

B. Subsidiary:

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

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. }
 Bromoform } Sp. gr. Size-Grade(s) 112-116 mm.

Analyst KUNDERT
 Date MAY 13, 1935

Wt. of sample	1.44 gm.	100.0%
Heavy Minerals	.14 gm.	9.7%
Light Minerals	1.30 gm.	90.3%

Shape Analysis:

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

Minerals Identified:

Heavy Concentrate	No. of Grains	Rel. %
Pyrite	825	44.4
Zircon-Unzoned	8	0.9
Jourmaline-Green	1	0.1
" -Brown	2	0.2
Clay Aggregates	38	4.4
Total	874	100%

Classification Grouping:

Primary Minerals:	Absol. %
Zircons-Unzoned	0.1
Jourmaline-Green	
" -Brown	
Clay Minerals	26.6
Feldspars	0.2
Quartz	60.8

Light Concentrate	No. of Grains	Rel. %
Chert	50	2.9
Clay Minerals	500	29.4
Feldspar	3	0.2
Muscovite	2	0.1
Quartz	1145	67.4
Total	1700	100%

Secondary Minerals:	Absol. %
Pyrite	9.2
Chert	2.6
Muscovite	0.1
Clay Agg	0.4
Total	12.3%

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

sls: 60% ± lt. to dark grey and dark red, non-calcareous
 fine limestone fragments 20% ± buff finely crystalline
 dense; sandstone 20% ± A to a, major grade 1/4-1/8, pri. sub 1/8-1/16

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15%)

1. Sample weight 20.15 gm. 100.0% : F. P. _____
2. Wt. of _____
3. Wt. after solution, with filter paper gm.
4. Less wt. F. P. (2) gm.
5. Wt. Insol. Residue (3 minus 4) 16.94 gm. 59.5 %
6. Wt. lost by solution (1 minus 5) 8.21 gm. 40.5 %
7. To balance (5 plus 6) 22.15 gm. 100 %

Well No. W- 0117
 Depth 1405' to 1410'
 No. samples used 2
 Analyst Scott
 Date 4/1/35

B. Subsidiary:

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	<u>1.99</u>	<u>17.0</u>
1-1/2 mm	<u>1.98</u>	<u>12.7</u>
1/2-1/4 mm	<u>2.19</u>	<u>18.7</u>
1/4-1/8 mm	<u>2.90</u>	<u>24.9</u>
1/8-1/16	<u>2.24</u>	<u>19.2</u>
Pan	<u>.88</u>	<u>7.5</u>
Total	<u>11.68</u>	<u>100.0</u>

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } ± 2.93 Sp. gr. Size-Grade(s) 1/2 - 1/6 mm.

Analyst Pyre
 Date 4/18/35

- Wt. of sample 2.15 gm. 100.0%
- Heavy Minerals39 gm. 15.8 %
- Light Minerals 1.81 gm. 84.2 %

Shape Analysis:

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

Minerals Identified;

No. of Grains

Rel. %

Classification Grouping:

Absol. %

Heavy Concentrate	No. of Grains	Rel. %
pyrite	<u>959</u>	<u>82.4</u>
sphalerite	<u>15</u>	<u>1.3</u>
zircon-zoned	<u>7</u>	<u>.6</u>
zoned	<u>0</u>	<u>0</u>
tour. green	<u>1</u>	<u>.1</u>
leucocene	<u>11</u>	<u>.9</u>
scale	<u>167</u>	<u>14.4</u>
magnetite	<u>4</u>	<u>.3</u>
Total	<u>1164</u>	<u>100%</u>

Primary Minerals: 74.4 %

zircon-zoned	<u>.1</u>
tour. green	<u>0</u>
magnetite	<u>0</u>
clay aggregates	<u>49.1</u>
feldspar	<u>.1</u>
quartz	<u>34.9</u>
moscovite	<u>.2</u>

Light Concentrate	No. of Grains	Rel. %
clay aggregates	<u>391</u>	<u>58.2</u>
feldspar	<u>1</u>	<u>.1</u>
quartz	<u>278</u>	<u>41.4</u>
moscovite	<u>2</u>	<u>.3</u>
Total	<u>672</u>	<u>100%</u>

Secondary Minerals: 15.6 %

pyrite	<u>13.0</u>
sphalerite	<u>.2</u>
leucocene	<u>.1</u>
scale	<u>2.3</u>

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

Shale - dk. gray, fissile 30%; light green 10%; Limestone 40% lt. grey;
Sandstone 15-20%; quartz; A; Pyrite ± 5%

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl 1.5%)

1. Sample weight	20.48 gm.	100.0%	2. Wt. of F. P.	
3. Wt. after solution, with filter paper				
4. Less wt. F. P. (2)				
5. Wt. Insol. Residue (3 minus 4)	14.27 gm.	70%		
6. Wt. lost by solution (1 minus 5)	6.21 gm.	30%		
7. To balance (5 plus 6)	20.48 gm.	100%		

Well No. W- 011.1
 Depth 1412 1/2 to 1414 1/2
 No. samples used 1
 Analyst Scott
 Date 4/14/35

B. Subsidiation:

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

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2+1 mm	7.65	55.0
1-1/2 mm	2.15	15.5
1/2-1/4 mm	1.41	10.1
1/4-1/8 mm	1.22	8.8
1/8-1/16	.89	6.4
Pan	.59	4.2
Total	13.91	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } Sp. gr. 2.93 Size-Grade(s) 4-Pan mm.

Analyst Pyre
 Date 4/18/35

Wt. of sample 2.80 gm. 100.0%

Shape Analysis:

Heavy Minerals .16 gm. 5.7%

A. %: a. %: C. %

Light Minerals 2.64 gm. 94.3%

r. %: R. %

Minerals Identified:

Heavy Concentrate	No. of Grains	Rel. %
pyrite	2500 (est.)	92
sphalerite	18	1
zircon {zoned}	3	1
zircon {unzoned}	34	1
tourmaline {green}	3	0
tourmaline {brown}	3	0
tourmaline {blue}	1	0
garnet	1	0
anatase	1	0
casings scale	160	6

Classification Grouping:

Primary Minerals:	Absol. %
zircon {zoned}	0
zircon {unzoned}	.1
tourmaline {green}	0
tourmaline {brown}	0
tourmaline {blue}	0
garnet	0
clay aggregates	81.1
muscovite	0
quartz	13.2

Total 2724 100%

Light Concentrate	Rel. %
clay aggregates	86
muscovite	0
quartz	14

Total 627 100%

Secondary Minerals:	Rel. %
pyrite	5.2
sphalerite	.1
anatase	0
casings scale	.3

Total 100%

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

Shale - 60-65% [90-50% dk. gray, fissile; 10-15% light green;] Limestone cream to gray, 30%; 5-10% qtz. sand; angular; 2-3% pyrite.

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl... 1.2%)

- | | | | |
|--|-----------|--------|-------------------------|
| 1. Sample weight | 20.11 gm. | 100.0% | 2. Wt. of F. P. |
| 3. Wt. after solution, with filter paper | 8.89 gm. | 44.6% | |
| 4. Less wt. F. P. (2) | | | |
| 5. Wt. Insol. Residue (3 minus 4) | 11.22 gm. | 58.4% | |
| 6. Wt. lost by solution (1 minus 5) | 20.11 gm. | 100% | |
| 7. To balance (5 plus 6) | | | |

Well No. W-- 0117
 Depth 1414 1/2 to 1418 1/2
 No. samples used 1
 Analyst Scott
 Date 4/4/35

B. Subsidiary:

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

C. Screen Analysis 239

SIZE	GRAMS	%
2 plus		
2+1 mm	1.39	4.7
1-1/2 mm	1.26	5.3
1/2-1/4 mm	1.39	6.9
1/4-1/8 mm	2.13	25.8
1/8-1/16	1.90	23.1
Pan	1.17	14.2
Total	8.29	100.0

MINERALOGICAL ANALYSIS

Acet. Tetrabr. Bromoform } ±2.93 Sp. gr. Size-Grade(s) 1/8 - Pan mm. (Use opposite side of page for details of minerals)

Analyst Pyre
 Date 4/18/35

- | | | |
|--------------------------|----------|--------|
| Wt. of sample | 3.02 gm. | 100.0% |
| Heavy Minerals | .39 gm. | 12.9% |
| Light Minerals | 2.63 gm. | 87.1% |

Shape Analysis:

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

Minerals Identified;	No. of Grains	Rel. %
Heavy Concentrate		
Pyrite	1000 est. 1	90.9
Sphalerite	4	.4
Zircon	1	.1
Zircon zoned	18	1.6
Tourmaline green	3	.3
Tourmaline brown	3	.3
Tourmaline blue	1	.1
Scale	70	6.3
Total	1100	100%

Classification Grouping: Primary Minerals: 87.4% Absol. %

Zircon zoned	0
Zircon un-zoned	.2
Tourmaline green	0
Tourmaline brown	0
Tourmaline blue	0
clay	72.3
Feldspar	.4
Muscovite	.2
quartz	14.3

Light Concentrate	No. of Grains	Rel. %
clay aggregates	898	80.9
Feldspar	5	.5
Muscovite	2	.2
quartz	168	15.4
Total	1100	100%

Secondary Minerals: 12.6%
 pyrite 11.7
 sphalerite1
 casing scale8

Total 1423 100% Total 100%
 Revised Lithologic Description (from descriptive log and laboratory data).

Ls. 5.8% s. cream to light gray; Shale ± 30% ; mostly dk. gry, fissile; some light green; Sandstone ± 10% A; maj. grade 1/4 - 1/2 mm; Pyrite ± 5% ;

DEEP WELL STUDY

MECHANICAL ANALYSIS

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

- | | | | |
|--|-----------|--------|-----------------------|
| 1. Sample weight | 20.63 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) | 12.47 gm. | 60.5 % | |
| 6. Wt. lost by solution (1 minus 5) | 8.16 gm. | 39.5 % | |
| 7. To balance (5 plus 6) | 20.63 gm. | 100 % | |

B. Subsidiation:

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

Well No. W— 0117
 Depth 1412 1/2 to 1422 1/2
 No. samples used 1
 Analyst Scott
 Date 4/4/35

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2+1 mm	1.68	13.7
1-1/2 mm	1.56	12.8
1/2-1/4 mm	1.81	14.8
1/4-1/8 mm	2.66	21.8
1/8-1/16	2.73	22.0
Pan	1.79	14.6
Total	12.23	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.

- | | | |
|--------------------------|----------|--------|
| Wt. of sample | 2.75 gm. | 100.0% |
| Heavy Minerals | .33 gm. | 12 % |
| Light Minerals | 2.42 gm. | 88 % |

Shape Analysis:

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

Minerals Identified:

No. of Grains Rel. %

Classification Grouping:

Absol. %

Heavy Concentrate	No. of Grains	Rel. %
Pyrite	3500	95
Zircon-Unzoned	8	0
Tourmaline-Green	2	0
" -Brown	1	0
Casing Scale	185	5
Total	3696	100%

Primary Minerals:

Zircon-Unzoned	0
Tourmaline-Green	0
" -Brown	0
Quartz	50.2
Clay Minerals	36.9

Light Concentrate	No. of Grains	Rel. %
Chert	15	1
Clay Minerals	600	42
Quartz	800	57
Total	1415	100%

Secondary Minerals:

Pyrite	11.4
Chert	.9
Casing Scale	.6

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

Shale (washed sample) +40% med to dk gray, fissile,
 30-40% cream to light gray Limestone; +30% A-C
 quartz sand; 1/4-1/8 and 1/8-1/16 major grades; 10% at Pyrite

Analyst KUNBERT
 Date APR 18, 1935

Total 100%

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl...15.....%)

- | | | | |
|--|-----------|--------|-----------------------|
| 1. Sample weight | 20.92 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) | 15.77 gm. | 75.4 % | |
| 6. Wt. lost by solution (1 minus 5) | 5.15 gm. | 24.6 % | |
| 7. To balance (5 plus 6) | 20.92 gm. | 100 % | |

Well No. W- 0117
 Depth 1422 1/2 to 1433
 No. samples used 2
 Analyst Scott
 Date 4/11/35

B. Subsidiation:

- | | | |
|-------------------------------|-----------|--------|
| 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	1.47	7.4
1-1/2 mm	1.29	8.0
1/2-1/4 mm	1.79	11.5
1/4-1/8 mm	5.55	35.6
1/8-1/16	4.55	29.2
Pan	.99	6.3
Total	15.59	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform { ±2.93 Sp. gr. Size-Grade(s) 4-1/8 - 1/16 mm.

Analyst Pyre
 Date 4/18/35

Wt. of sample 3.28 gm. 100.0%
 Heavy Minerals10 gm. 3.5 %
 Light Minerals 3.18 gm. 97.0 %

Shape Analysis:

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

Minerals Identified:	No. of Grains	Rel. %
Heavy Concentrate		
pyrite	1500(est.)	85
sphalerite	16	1
zircon {zoned}	9	0
zircon {unzoned}	40	2
tourmaline {green}	6	0
tourmaline {brown}	10	1
tourmaline {blue}	2	1
garnet	15	1
leucosene	18	1
casing scale	150	7
Total	1761	100%

Classification Grouping:	Absol. %
Primary Minerals: 97.1 %	
zircon {zoned}	0
zircon {unzoned}	0
tourmaline {green}	0
tourmaline {brown}	0
tourmaline {blue}	0
garnet	0
clay aggregates	26.2
feldspar	1.0
quartz	69.9

Light Concentrate	Total	100%
clay aggregates	257	27
feldspar	19	1
quartz	697	72
Total	968	100%

Secondary Minerals: 2.9 %	Total	100%
pyrite	2.6	
sphalerite	0	
leucosene	0	
casing scale	.3	

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

Sandstone - 50-60% ; maj. grade 1/4 - 1/8 mm, prin. subsid. 1/8 - 1/16; A-C; Limestone 25% ; Shale (from above) dk. gray & green 10-20% ; Pyrite 2-3%

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl...15...%)

1. Sample weight 20.64 gm. 100.0%: F. P. _____
2. Wt. of _____
3. Wt. after solution, with filter paper gm.
4. Less wt. F. P. (2) gm.
5. Wt. Insol. Residue (3 minus 4) 15.92 gm. 77.1 %
6. Wt. lost by solution (1 minus 5) 4.72 gm. 22.9 %
7. To balance (5 plus 6) 20.64 gm. 100 %

B. Subsidiation:

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

Well No. W- 0117

Depth 1432 to 1435 1/2

No. samples used 1

Analyst Scott

Date 4/4/35

C. Screen Analysis 1589

SIZE	GRAMS	%
2 plus		
2+1 mm	<u>.29</u>	<u>5.1</u>
1-1/2 mm	<u>.93</u>	<u>6.0</u>
1/2-1/4 mm	<u>3.32</u>	<u>21.4</u>
1/4-1/8 mm	<u>7.05</u>	<u>45.5</u>
1/8-1/16	<u>2.81</u>	<u>18.1</u>
Pan	<u>.51</u>	<u>3.3</u>
Total	<u>15.51</u>	<u>100.0</u>

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 Pyre

Date 4/20/35

Wt. of sample 2.77 gm. 100.0%

Heavy Minerals10 gm. 3.6 %

Light Minerals 2.67 gm. 96.4 %

Shape Analysis:

A. %: a. %: C. %

r %: R %

Minerals Identified:

Heavy Concentrate	No. of Grains	Rel. %
pyrite	1500	92.2
sphalerite	4	.2
zirconozoned	3	.2
zirconozoned	56	3.4
tourmaline {green	11	.7
{brown	13	.8
{blue	1	.1
garnet	15	.9
leucosene	20	1.2
rutile	1	.1
magnetite	3	.2
Total	1627	100%

Classification Grouping:

Primary Minerals: 96.7 % Absol. %

zirconozoned	0
zirconozoned	.1
tourmaline {green	0
{brown	0
{blue	0
garnet	0
rutile	0
magnetite	0
Clay aggregates	33.2
feldspar	1.0
muscovite	.1
quartz	62.3
Secondary Minerals:	3.3 %

pyrite	3.3
sphalerite	0
leucosene	0
Total	100%

Light Concentrate

Clay aggregates	243	34.4
feldspar	7	1
muscovite	1	.1
quartz	455	64.5
Total	706	100%

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

S.S. 50-60% ; maj. grade 1/8-1/16 mm; A-a; 20-25% dk. grey & green shale
(From above ?); 20-25% ls. frags; 2-3% pyrite.

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl...1.5.....%)

1. Sample weight 20.60 gm. 100.0%: F. P. _____
 2. Wt. of _____
 3. Wt. after solution, with filter paper gm.
 4. Less wt. F. P. (2) gm.
 5. Wt. Insol. Residue (3 minus 4) 13.56 gm. 6.58 %
 6. Wt. lost by solution (1 minus 5) 7.04 gm. 34.2 %
 7. To balance (5 plus 6) 20.60 gm. 100 %

Well No. W- 0117
 Depth 1435 1/2 to 1443 1/2
 No. samples used 2
 Analyst Scott
 Date 4/4/35

B. Subsidiation:

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	<u>.31</u>	<u>2.3</u>
1-1/2 mm	<u>1.00</u>	<u>7.5</u>
1/2-1/4 mm	<u>3.11</u>	<u>20.4</u>
1/4-1/8 mm	<u>5.85</u>	<u>44.0</u>
1/8-1/16	<u>2.50</u>	<u>18.8</u>
Pan	<u>.53</u>	<u>4.0</u>
Total	<u>18.80</u>	<u>100.0</u>

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

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

Analyst Pyre
 Date 4/22/35

Wt. of sample 3.03 gm. 100.0%

Shape Analysis:

Heavy Minerals 1.3 gm. 4.3 %

A. %: a %: C %

Light Minerals 2.90 gm. 95.7 %

r %: R %

Minerals Identified:

Heavy Concentrate	No. of Grains	Rel. %
pyrite	1192	89
zircon { zoned	6	0
{ unzoned	90	7
tourmaline { green	11	1
{ brown	8	0
{ blue	1	0
garnet	17	1
leucosene	20	0
magnetite	2	0
titanite	1	0
Total	1344	100%

Classification Grouping:

Primary Minerals:	Absol. %
zircon { zoned	0
{ unzoned	.3
tour. { green	0
{ brown	0
{ blue	0
garnet	0
magnetite	0
titanite	0
clay aggregates	29.7
feldspar	0
quartz	66.2
Secondary Minerals:	3.8 %
pyrite	3.8
leucosene	0

Light Concentrate	No. of Grains	Rel. %
clay aggregates	208	31
feldspar	3	0
quartz	460	69
Total	671	100%

Total 100% Total 100%

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

S.S. - 50-60% A.O. med. grade, 1/8-1/4; prim. subsid. 1/2-1/4; 30-35% lt. gray to cream ls. frags.; 15-20% lgt. green shale. [from above?] 3-4% pyrite

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl...1.5...%)

1. Sample weight 20.60 gm. 100.0%: F. P. _____
 2. Wt. of
 3. Wt. after solution, with filter paper _____ gm.
 4. Less wt. F. P. (2) _____ gm.
 5. Wt. Insol. Residue (3 minus 4) 12.02 gm. 59.5 %
 6. Wt. lost by solution (1 minus 5) 8.58 gm. 41.5 %
 7. To balance (5 plus 6) 20.60 gm. 100 %

B. Subsidiation:

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

Well No. W— 0117
 Depth 1443 1/2 to 1451 1/2
 No. samples used. 2
 Analyst Scott
 Date 4/4/35

C. Screen Analysis ¹²⁰⁰

SIZE	GRAMS	%
2 plus		
2+1 mm	<u>.14</u>	<u>1.2</u>
1-1/2 mm	<u>.74</u>	<u>6.2</u>
1/2-1/4 mm	<u>1.76</u>	<u>14.8</u>
1/4-1/8 mm	<u>4.86</u>	<u>40.9</u>
1/8-1/16	<u>3.74</u>	<u>31.4</u>
Pan	<u>.16</u>	<u>5.5</u>
Total	<u>11.90</u>	<u>100.0</u>

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } ±2.93 Sp. gr. Size-Grade(s) 1/8 - 1/6 mm.

Analyst Pyre
 Date 4/22/35

Wt. of sample 3.63 gm. 100.0%
 Heavy Minerals17 gm. 4.7 %
 Light Minerals 3.46 gm. 95.3 %

Shape Analysis:

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

Minerals Identified: Heavy Concentrate

Mineral	No. of Grains	Rel. %
pyrite	1936	88.9
sphalerite	2	.1
zirconozoned	3	.2
unzoned	112	6.9
tourmaline { green	6	.4
{ brown	6	.4
{ blue	3	.2
garnet	11	.7
leucocore	34	2.1
rutile	2	.1

Classification Grouping:

Primary Minerals:	Absol. %
zirconozoned	0
unzoned	.3
tourmaline { green	0
{ brown	0
{ blue	0
garnet	0
rutile	0
clay aggregates	13
feldspar	1.5
quartz	77.4

Total 1,615 100%

Light Concentrate

Mineral	Rel. %
chert	3.7
clay aggregates	13.6
feldspar	1.6
quartz	81.1

Total 945 100%

Secondary Minerals: 7.2 %

pyrite	4.2
sphalerite	0
leucocore	.1
chert	3.5

Total 100%

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

S.S. ±50% ; A-a; maj grade 1/8-1/6 mm; prim. subsid. 1/8-1/6; ±40% lt. gry. to cream ls.; ±5 light green shale; 9-5% pyrite

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl. 15%)

1. Sample weight 20.12 gm. 100.0% : F. P. _____
2. Wt. of _____
3. Wt. after solution, with filter paper gm.
4. Less wt. F. P. (2) gm.
5. Wt. Insol. Residue (3 minus 4) 12.85 gm. 63.8 %
6. Wt. lost by solution (1 minus 5) 7.27 gm. 36.2 %
7. To balance (5 plus 6) 20.12 gm. 100 %

Well No. W- 0117

Depth 1451 1/2 to 1455 1/2

No. samples used 1

Analyst Scott

Date 4/4/35

B. Subsidiation:

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 1/2 mm	.64	5.1
1/2-1/4 mm	1.28	10.0
1/4-1/8 mm	4.23	33.4
1/8-1/16	5.41	42.8
Pan	1.10	8.9
Total	12.66	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } ± 2.93 Sp. gr. Size-Grade(s) 4-1/2 mm.

Analyst Pyre

Date 9/22/35

Wt. of sample 47 gm. 100.0%

Heavy Minerals 25 gm. 10.6 %

Light Minerals 42 gm. 89.4 %

Shape Analysis:

A. % : a. % : C. %

r. % : R. %

Minerals Identified;	No. of Grains	Rel. %
Heavy Concentrate		
pyrite	1114	87.4
sphalerite	1	0.0
zirconozoned	3	0.0
tourmaline green	10	1.2
tourmaline brown	23	2.0
tourmaline blue	2	0.1
garnet	15	1.4
leucosene	52	4.0
rutile	1	0.0
magnetite	6	0.0
staurolite	1	0.0
anatase	1	0.0
rutile	1	0.0
Total	1289	100%

Classification Grouping: **90.4 %** Absol. %

Primary Minerals:	Absol. %
zirconozoned	.5
unzoned	.5
tourmaline green	.1
tourmaline brown	.2
tourmaline blue	.1
garnet	.1
rutile	0
magnetite	0
staurolite	0
titanite	0
clay aggregates	19.2
feldspar	1.1
quartz	69.2

Secondary Minerals:	Absol. %
pyrite	9.2
sphalerite	0
leucosene	.4
anatase	.1

Light Concentrate	No. of Grains	Rel. %
clay aggregates	187	21.4
feldspar	11	1.2
quartz	678	77.4
Total	876	100%

Total 100% Total 100%

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

SS. ± 50% ; maj. grade 4-16 ; prin. subsid 4-16 ; A-a ; Limestone ± 35% ; light grey to cream : 5-10% shale ; ± 5% pyrite

DEEP WELL STUDY

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 | gm. | | |
| 4. Less wt. F. P. (2) | gm. | | |
| 5. Wt. insol. Residue (3 minus 4) | 8.17 gm. | 40.0 % | |
| 6. Wt. lost by solution (1 minus 5) | 12.25 gm. | 60.0 % | |
| 7. To balance (5 plus 6) | 20.37 gm. | 100 % | |

Well No. W- 0117
 Depth 1455 1/2 to 1460 1/2
 No. samples used 1
 Analyst Scott
 Date 4/4/35

B. Subsidiary:

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

C. Screen Analysis 8.08

SIZE	GRAMS	%
2 plus		
2-1 mm		11.9
1-1/2 mm	.56	6.9
1/2-1/4 mm	1.10	13.6
1/4-1/8 mm	2.27	28.0
1/8-1/16	2.40	29.6
Pan	.81	10.0
Total	8.10	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 Pyre
 Date 9/22/35

Wt. of sample 2.96 gm. 100.0%
 Heavy Minerals 1.05 gm. 35.5 %
 Light Minerals 1.91 gm. 64.5 %

Shape Analysis:

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

Minerals Identified: Heavy Concentrate	No. of Grains	Rel. %
pyrite	1534	91.5
sphalerite	2	0
zircon	9	1
zircon {zoned}	88	5
tourmaline {green}	3	1
tourmaline {brown}	11	1
tourmaline {blue}	1	0
garnet	1	0
leucosene	25	1.5
rutile	3	0
magnetite	2	0
Total	1678	100%

Classification Grouping:
 Primary Minerals: 78.4 %

zircon {zoned}	0
zircon {unzoned}	.1
tourmaline {green}	0
tourmaline {brown}	0
tourmaline {blue}	0
garnet	0
rutile	0
magnetite	0
Clay	41.3
Feldspar	1.0
muscovite	0
Quartz	56.0
Secondary Minerals:	1.6 %
pyrite	1.6
sphalerite	0
leucosene	0

Light Concentrate	No. of Grains	Rel. %
clay aggregates	278	42
feldspar	7	1
muscovite	3	0
quartz	381	57
Total	669	100%

Total 100%

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

ls. - 60% : brownish buff; fine grained; sugary; poorly consolidated; ±20% quartz sand; maj. grades 1/4-1/8-1/16; A-a; ±10% clay as impurity in limestone; ±10% green shale from above; 1-2% pyrite

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl. 1.5%)

1. Sample weight 20.28 gm. 100.0%: F. P. _____
2. Wt. of _____
3. Wt. after solution, with filter paper _____ gm.
4. Less wt. F. P. (2) _____ gm.
5. Wt. Insol. Residue (3 minus 4) 5.70 gm. 28.2 %
6. Wt. lost by solution (1 minus 5) 14.58 gm. 71.8 %
7. To balance (5 plus 6) 20.28 gm. 100 %

B. Subsidiation:

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

Well No. W- 0117

Depth 1460 1/2 to 1465 1/2

No. samples used 1

Analyst Scott

Date 4/4/35

C. Screen Analysis 900

SIZE	GRAMS	%
2 plus		
2-1 mm		
4 1/2 mm	<u>.80</u>	<u>14.7</u>
1/2-1/4 mm	<u>1.33</u>	<u>24.4</u>
1/4-1/8 mm	<u>1.31</u>	<u>33.3</u>
1/8-1/16	<u>1.00</u>	<u>18.4</u>
Pan	<u>.50</u>	<u>9.2</u>
Total	<u>5.44</u>	<u>100.0</u>

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. } ±2.93 Sp. gr. Size-Grade(s) 1/4 Pan mm.

Bromoform }

Analyst Pyre

Date 7/23/35

Wt. of sample 3.16 gm. 100.0%

Heavy Minerals07 gm. 2.2 %

Light Minerals 3.09 gm. 97.8 %

Shape Analysis:

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

r. _____ %: R. _____ %

Minerals Identified:	No. of Grains	Rel. %
Heavy Concentrate		
pyrite	518	91
Sphalerite	1	0
zirconozoned	1	0
zirconozoned	18	0
tourmaline {green	5	1
{brown	6	0
{blue	1	0
garnet	4	1
leucocene	14	0
rutile	1	0
Total	<u>569</u>	<u>100%</u>

Classification Grouping: 97.9 %

Primary Minerals:	Absol. %
zirconozoned	0
unzoned	.1
tourmaline {green	0
{brown	0
{blue	0
garnet	0
rutile	0
clay aggregates	52.8
feldspar	1.0
muscovite	0
quartz	44.1

Light Concentrate	Rel. %
clay aggregates	54
feldspar	1
muscovite	45
quartz	322
Total	<u>716</u> 100%

Secondary Minerals:	Absol. %
pyrite	2.0
sphalerite	0
leucocene	.1

Total _____ 100% Total _____ 100%

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

Limestone - 70-80% ; brownish buff; fine grained; dense; well consolidated;
Quartz sand, 10-15% ; maj. grade 1/4 - 1/2 ; A-a; some grains ^{perfect} euhedral crystals; shale
10-15% ; partly from above; 1-2% pyrite

DEEP WELL STUDY

MECHANICAL ANALYSIS

- A. Acid treatment (HCl 1.5%)
1. Sample weight 20.34 gm. 100.0%: F. P. _____
2. Wt. of solution, with filter paper gm.
3. Less wt. F. P. (2) gm.
4. Wt. Insol. Residue (3 minus 4) 7.12 gm. 34.9 %
5. Wt. lost by solution (1 minus 5) 13.22 gm. 65.1 %
6. To balance (5 plus 6) 20.34 gm. 100 %

Well No. W— 0117

Depth 1465 1/2 to 1470 1/2

No. samples used 1

Analyst Scott

Date 4/6/35

- B. Subsidiary:
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	<u>1.19</u>	<u>3.5</u>
1-1/2 mm	<u>1.04</u>	<u>18.7</u>
1/2-1/4 mm	<u>1.21</u>	<u>22.0</u>
1/4-1/8 mm	<u>1.17</u>	<u>21.3</u>
1/8-1/16	<u>.92</u>	<u>16.3</u>
Pan	<u>.99</u>	<u>18.0</u>
Total	<u>5.50</u>	<u>100.0</u>

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform { ± 3.73 Sp. gr. Size: 1/4 - Pan Grade(s) 1/4 - Pan mm.

Analyst Pyre

Date 9/22/35

Wt. of sample 3.11 gm. 100.0%

Heavy Minerals04 gm. 1.3 %

Light Minerals 3.07 gm. 98.7 %

Shape Analysis:

A. %: a. %: C. %

r. %: R. %

Minerals Identified:	No. of Grains	Rel. %
Heavy Concentrate		
pyrite	<u>912</u>	<u>91.5</u>
zircon { zoned	<u>3</u>	<u>.3</u>
tourmaline { green	<u>59</u>	<u>5.4</u>
{ brown	<u>9</u>	<u>.3</u>
{ blue	<u>3</u>	<u>.1</u>
garnet	<u>1</u>	<u>.1</u>
leucorene	<u>12</u>	<u>1.2</u>
anatase	<u>2</u>	<u>.2</u>
Total	<u>997</u>	<u>100%</u>

Classification Grouping:	Absol. %
Primary Minerals: <u>98.7</u> %	
zircon { zoned	<u>.1</u>
tourmaline { green	<u>.1</u>
{ brown	<u>.1</u>
{ blue	<u>.1</u>
garnet	<u>.1</u>
clay aggregates	<u>69.3</u>
feldspar	<u>.4</u>
quartz	<u>29.0</u>

Light Concentrate	No. of Grains	Rel. %
clay aggregates	<u>628</u>	<u>70.2</u>
feldspar	<u>9</u>	<u>.4</u>
quartz	<u>269</u>	<u>29.4</u>
Total	<u>896</u>	<u>100%</u>

Secondary Minerals:	%
pyrite	<u>1.2</u>
leucorene	<u>.3</u>

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

Limestone - brownish buff; fine to med. grained; poorly consolidated; 20-25%
shale in part as ls. impurity & in part as contamination from above; 10-15%
qtz. sand very poorly sorted; ± 1% pyrite

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl...%)

1. Sample weight 20.39 gm. 100.0%: F. P. _____
 2. Wt. of
 3. Wt. after solution, with filter paper _____ gm.
 4. Less wt. F. P. (2) _____ gm.
 5. Wt. Insol. Residue (3 minus 4) 8.81 gm. 43.3 %
 6. Wt. lost by solution (1 minus 5) 11.58 gm. 56.7 %
 7. To balance (5 plus 6) 20.39 gm. 100 %

B. Subsidiation:

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

Well No. W— 0117
 Depth 1420' to 1474'
 No. samples used 1
 Analyst Scott
 Date 4/4/35

C. Screen Analysis 8.77

SIZE	GRAMS	%
2 plus		
2+1 mm	<u>0.32</u>	<u>3.7</u>
1-1/2 mm	<u>1.31</u>	<u>15.3</u>
1/2-1/4 mm	<u>1.82</u>	<u>21.2</u>
1/4-1/8 mm	<u>1.82</u>	<u>21.2</u>
1/8-1/16	<u>2.27</u>	<u>26.4</u>
Pan	<u>1.05</u>	<u>12.2</u>
Total	<u>8.59</u>	<u>100.0</u>

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoforn } ± 2.93 Sp. gr. Size-Grade(s) 1/8 - Pan mm.

Analyst KUNDERT
 Date APR. 23, 1935

Wt. of sample 3.29 gm. 100.0%
 Heavy Minerals 1.02 gm. 0.6 %
 Light Minerals 2.27 gm. 99.4 %

Shape Analysis:

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

Minerals Identified: Heavy Concentrate

Pyrite
 Zircon-Zoned
 " - Unzoned
 Tourmaline-Green
 " - Brown
 Garnet
 Chlorite
 Hematite-Scale

No. of Grains Rel. %

1225 - 70.3
5 - .3
260 - 14.9
10 - .9
23 - 1.3
2 - .1
2 - .1
210 - 12.1

Classification Grouping:

Primary Minerals: 57.8 %
 Zircon-Zoned - .1
 " - Unzoned - 0
 Tourmaline-Green - 0
 " - Brown - 0
 Garnet - 1.0
 Feldspar - 56.7
 Quartz -

Absol. %

Total 1.743 100%

Light Concentrate

Chert
 Clay Minerals
 Feldspar
 Glauconite
 Quartz
 Total

140 - 10
462 - 32
18 - 1
1 - 0
805 - 57
1426 100%

Secondary Minerals: 42.2 %

Pyrite - .4
 Chlorite - .1
 Scale - 9.9
 Chert - 31.8
 Clay Minerals -

Total Glauconite 100%

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

ls. - Brownish buff; slightly dolomitic; fine to medium grained; impure; 1/8-1/16 major grade; prin. sub. split between 1/2-1/4 and 1/4-1/8; ± 5% chert; 10-15% qtz sand; 5-10% shale fragments; ± 1% pyrite -

DEEP WELL STUDY

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 _____ gm.

4. Less wt. F. P. (2) _____ gm.

5. Wt. Insol. Residue (3 minus 4) 4.04 gm. 43.9 %

6. Wt. lost by solution (1 minus 5) 11.55 gm. 56.1 %

7. To balance (5 plus 6) 20.59 gm. 100 %

B. Subsidiation:

1. Original Wt. _____ gm. 100.0%

2. Cylinder (+1/32) _____ gm. _____ %

3. Jar (1/32—1/64) _____ gm. _____ %

4. Drain _____ gm. _____ %

Well No. W— D117

Depth 1474½ to 1477½

No. samples used _____

Analyst Scott

Date 4/4/35

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2+1 mm	<u>.15</u>	<u>1.7</u>
1-½ mm	<u>1.05</u>	<u>11.2</u>
½-¼ mm	<u>1.58</u>	<u>17.9</u>
¼-⅛ mm	<u>2.00</u>	<u>22.6</u>
⅛-1/16	<u>2.80</u>	<u>31.7</u>
Pan	<u>1.26</u>	<u>14.2</u>
Total	<u>8.84</u>	<u>100.0</u>

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

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

Bromoforn }

Analyst KUNDERT

Date APR. 23, 1935

Wt. of sample 2.84 gm. 100.0% Shape Analysis:

Heavy Minerals09 gm. 1.4 % A. _____ %: a. _____ %: C. _____ %

Light Minerals 2.80 gm. 98.6 % r. _____ %: R. _____ %.

Minerals Identified:	No. of Grains	Rel. %	Classification Grouping:	Absol. %
Heavy Concentrate			Primary Minerals: <u>98.6</u> %	
Pyrite	<u>940</u>	<u>94</u>	Zircons-Unzoned	<u>1</u>
Zircon-Unzoned	<u>50</u>	<u>4</u>	Tourmaline-Green	<u>0</u>
Jourmaline-Green	<u>14</u>	<u>1</u>	" Brown	<u>0</u>
" - Brown	<u>7</u>	<u>1</u>	Garnet	<u>0</u>
Garnet	<u>4</u>	<u>0</u>	Quartz	<u>53.3</u>
Chlorite	<u>2</u>	<u>0</u>		
Hematite-Scale	<u>110</u>	<u>10</u>		
Total	<u>1127</u>	<u>100%</u>		

Light Concentrate	No. of Grains	Rel. %	Secondary Minerals:	Absol. %
Chert	<u>56</u>	<u>5</u>	Pyrite	<u>0</u>
Clay Minerals	<u>460</u>	<u>41</u>	Chlorite	<u>1</u>
Quartz	<u>600</u>	<u>54</u>	Scale	<u>4</u>
			Chert	<u>4</u>
			Clay Minerals	<u>404</u>
Total	<u>1116</u>	<u>100%</u>		

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

ls: Brownish buff; medium grained; ⅛-¼ major grade; ¼-⅛ prin. sub; shale 2.0% ±; ±5% white chert; ±1% pyrite -

(over)

(Quite difficult to distinguish between chert and clay minerals due to discoloration of chert particles by Fe. Percentage of chert in light concentrate may be higher.)
Kundert

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl...15...%)

1. Sample weight 20.47 gm. 100.0%: F. P. _____

2. Wt. of _____

3. Wt. after solution, with filter paper _____ gm.

4. Less wt. F. P. (2) _____ gm.

5. Wt. Insol. Residue (3 minus 4) 13.40 gm. 65.4 %

6. Wt. lost by solution (1 minus 5) 7.07 gm. 34.6 %

7. To balance (5 plus 6) 20.47 gm. 100 %

Well No. W- 0117

Depth 14.77 1/2 to 14.81 1/2

No. samples used 2

Analyst Scott

Date 4/25

B. Subsidiation:

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		
1-1/2 mm	<u>95</u>	<u>7.1</u>
1/2-1/4 mm	<u>2.58</u>	<u>12.6</u>
1/4-1/8 mm	<u>76</u>	<u>50.6</u>
1/8-1/16	<u>2.91</u>	<u>14.2</u>
Pan	<u>.67</u>	<u>5.0</u>
Total	<u>13.71</u>	<u>100.0</u>

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. } 12.93 Sp. gr. Size-Grade(s) 8-16 mm.

Bromoform }

Analyst KUNDEERT-

Date APR. 24, 1935

Wt. of sample 2.38 gm. 100.0% Shape Analysis:

Heavy Minerals _____ gm. 4.2 % A. _____ %: a. _____ %: C. _____ %

Light Minerals 2.28 gm. 95.8 % r. _____ %: R. _____ %

Minerals Identified:	No. of Grains	Rel. %	Classification Grouping:	Absol. %
Heavy Concentrate			Primary Minerals: <u>41.3</u> %	
Pyrite	1650	72	Zircons-Unzoned	0
Zircon-Unzoned	52	3	Tourmaline-Green	0
Tourmaline-Green	5	0	" Brown	0
" - Brown	7	0	Garnet	0
Garnet	16	1	Apatite	0
Apatite	1	0	Quartz	0
Chlorite	1	0	Feldspar	0
Hematite-Scale	72	4		
Total	1804	100%	Secondary Minerals: <u>58.7</u> %	
Light Concentrate			Chlorite	0.2
Chert	61	7	Hematite-Scale	3.9
Clay Minerals	425	50	Pyrite	47.9
Feldspar	3	0	Clay Minerals	6.7
Quartz	363	43	Chert	
Total	857	100%	Total	100%

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

Sandstone; A to a; major grade 1/4-1/8; prin. sub. 1/2-1/4; 30-40% buff to tan L.S.; ±30% shale frags. from above; 2-3% pyrite;

DEEP WELL STUDY

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 | gm. | | |
| 4. Less wt. F. P. (2) | gm. | | |
| 5. Wt. Insol. Residue (3 minus 4) | 14.17 gm. | 69.7% | |
| 6. Wt. lost by solution (1 minus 5) | 6.12 gm. | 30.3% | |
| 7. To balance (5 plus 6) | 20.29 gm. | 100% | |

Well No. W— 0117

Depth 1481 1/2 to 1484 1/2

No. samples used 1

Analyst Scott

Date 9/4/35

B. Subsidiary:

- | | | | |
|-------------------------------|-----|--------|--|
| 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	1.43	10.0
1-1/2 mm	2.80	19.0
1/2-1/4 mm	3.74	26.4
1/4-1/8 mm	3.51	24.8
1/8-1/16	1.71	12.1
Pan	.98	6.9
Total	14.17	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. }
 Bromoform } Sp. gr. Size-Grade(s) Pan mm.

Analyst Pyre
 Date 9/23/35

Wt. of sample 2.64 gm. 100.0% Shape Analysis:

Heavy Minerals 3.00 gm. 3.00% A %: a %: C %
 Light Minerals 2.56 gm. 97.0% r %: R %

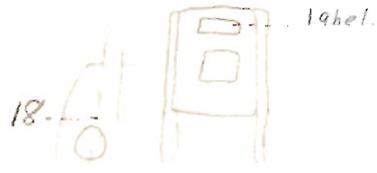
Minerals Identified;	No. of Grains	Rel. %	Classification Grouping:	Absol. %
Heavy Concentrate			Primary Minerals: 9.73%	
pyrite	1536	94	zircon { zoned	0
sphalerite	2	0	zircon { unzoned	0
zircon { zoned	4	3	tourmaline { green	0
zircon { unzoned	11	1	tourmaline { brown	0
tourmaline { green	6	0	tourmaline { blue	0
tourmaline { brown	1	0	garnet	0
tourmaline { blue	1	0	clay	56.5
garnet	20	1	rutile	0
leucocane	2	0	amphibole	0
rutile	1	0	brookite	0
amphibole	1	0	feldspar	.4
brookite	1	0	muscovite	.2
Total	1637	100%	quartz	9.9
Light Concentrate			Secondary Minerals: 2.5%	
clay aggregates	801	89.2	pyrite	.2
feldspar	9	.4	sphalerite	.6
muscovite	2	.2	leucocane	.2
quartz	92	10.2		
Total	899	100%		

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

* Shale - ± 6.0% ; ± 15% soluble; ls. frags. 10-15% ; Sandstone 10-12% ; mal. grade
 5-8 ; 1.2 ;

* apparently bit sample was used, washed sample is ss.
 1) See over.

D Brookite grain located at W 1830 on side vernier of mechanical stage and at 11 on bottom vernier with slide pushed in just to edge of clamps.



DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl. 15%)

- | | | | | |
|--|-----------|--------|---------------|-----------|
| 1. Sample weight | 20.29 gm. | 100.0% | F. P. | 2. Wt. of |
| 3. Wt. after solution, with filter paper | | | | |
| 4. Less wt. F. P. (2) | | | | |
| 5. Wt. Insol. Residue (3 minus 4) | 14.14 gm. | 69.7% | | |
| 6. Wt. lost by solution (1 minus 5) | 6.15 gm. | 30.3% | | |
| 7. To balance (5 plus 6) | 20.29 gm. | 100% | | |

Well No. W- 0117
 Depth 1484 1/2 to 1488
 No. samples used 1
 Analyst Scott
 Date 4/4/35

B. Subsidiation:

- | | | | | | |
|------------------------------|-----|--------|-------------------------------|-----|---|
| 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	11	4.9	
1-1/2 mm	1.84	13.0	
1/2-1/4 mm	2.81	19.9	
1/4-1/8 mm	5.56	39.5	
1/8-1/16	2.69	19.0	
Pan	58	3.7	
Total	14.11	100.0	✓

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } ±2.93 Sp. gr. Size-Grade(s) 1/2 - 1/16 mm.

Analyst Pyre
 Date 9/23/35

Wt. of sample 2.70 gm. 100.0%
 Heavy Minerals 11 gm. 6.3%
 Light Minerals 2.53 gm. 93.7%

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

Minerals Identified; Heavy Concentrate

No. of Grains	Rel. %
pyrite	95.9
sphalerite	1
Zircon { zoned } 16	1
Tourmaline { green } 3	1
Tourmaline { brown } 2	1
Tourmaline { blue } 1	1
garnet	4
leucocoxene	18
rutile	1
amphibole	1
anatase	1
r	2
Total	124.5

Classification Grouping: Absol. %

Primary Minerals:	Absol. %
Zircon { zoned }	1
Tourmaline { green }	0
Tourmaline { brown }	0
Tourmaline { blue }	0
garnet	0
rutile	0
amphibole	0
clay aggregates	27.2
feldspar	0.9
quartz	58.2

Light Concentrate

Chert	88	8
Clay aggregates	342	29
feldspar	11	1
glauconite	1	0
quartz	727	62
Total	1169	100%

Secondary Minerals:	Absol. %
pyrite	6.3
sphalerite	0
leucocoxene	1
anatase	0
x	0
chert	7.5
glauconite	0
Total	13.6

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

S.S. 40-45%; maj. grade 1/8 - 1/4; A-a; Limestone 30% lt. gray to buff; med. grained; Chert 5-10% clear, opalescent; Shale green, from above 20-25%; Pyrite ± 5%

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15%)

- | | |
|---|-------------------------|
| 1. Sample weight <u>20.67</u> gm. | 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) <u>14.25</u> gm. <u>68.8</u> % | |
| 6. Wt. lost by solution (1 minus 5) <u>6.42</u> gm. <u>31.2</u> % | |
| 7. To balance (5 plus 6) <u>20.67</u> gm. <u>100</u> % | |

Well No. W-0117
 Depth 1488 to 1492 1/2
 No. samples used 1
 Analyst Scott
 Date 4/4/35

B. Subsidiary:

- | | |
|-----------------------------------|--------|
| 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	.52	3.7
1-1/2 mm	1.06	7.6
1/2-1/4 mm	8.73	62.3
1/4-1/8 mm	2.79	19.9
1/8-1/16	.76	5.4
Pan	.15	1.1
Total	14.01	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. }
~~Bromoform~~ } Sp. gr. Size-Grade(s) 3-Pan mm.

Analyst Pyx
 Date 4/29/35

Wt. of sample 2.98 gm. 100.0%
 Heavy Minerals15 gm. %
 Light Minerals 2.83 gm. %

Shape Analysis:

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

Minerals Identified:	No. of Grains	Rel. %
Heavy Concentrate		
pyrite	1335	96.7
sphalerite	1	.1
zircon {zoned}	2	.1
{unzoned}	28	2.0
tourmaline {green}	6	.4
{brown}	5	.4
{color}	8	.6
garnet	7	.5
leucocene	5	.4
Total	1389	100%

Classification Grouping:	Absol. %
Primary Minerals:	
zircon {zoned}	.1
{unzoned}	.1
tourmaline {green}	.6
{brown}	.6
garnet	.5
clay aggregates	22.8
feldspar	1.0
quartz	69.4

Light Concentrate	No. of Grains	Rel. %
chert	25	3
clay aggregates	214	23
feldspar	12	1
quartz	672	73
Total	923	100%

Secondary Minerals:	Rel. %
pyrite	4.8
sphalerite	.0
leucocene	.0
chert	2.9
Total	7.7%

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

SS. 45-50% ; maj. grade 1/2-3/4 m.d. ; prismatic 1/2-3/4 ; A.O. ; some euhedral x-tals ;
Limestone - 30% ; impure interbedded with shale ; Shale 20-30% ; green ; Pyrite
± 5% ; chert 2-3%

DEEP WELL STUDY

MECHANICAL ANALYSIS

- A. Acid treatment (HCl 15%)
1. Sample weight 20.77 gm. 100.0% : F. P. _____
2. Wt. of _____
3. Wt. after solution, with filter paper _____ gm.
4. Less wt. F. P. (2) _____ gm.
5. Wt. Insol. Residue (3 minus 4) 11.55 gm. 55.5%
6. Wt. lost by solution (1 minus 5) 9.22 gm. 44.5%
7. To balance (5 plus 6) 20.77 gm. 100%

Well No. W- 0117

Depth 1492 1/2 to 1493 1/2

No. samples used _____

Analyst Scott

Date 4/4/35

- B. Subsidiary:
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		
1-1/2 mm		
1/2-1/4 mm		
1/4-1/8 mm		
1/8-1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. } ±2.9 Sp. gr. Size-Grade(s) 1/4 - Pan mm.
 Bromoform- }

Analyst Pyle

Date 4/29/35

Wt. of sample 3.03 gm. 100.0% Shape Analysis:

Heavy Minerals12 gm. 7% A. _____% : a. _____% : C. _____%

Light Minerals 2.91 gm. 96% r. _____% : R. _____%

Minerals Identified:	No. of Grains	Rel. %
Heavy Concentrate		
pyrite	1802	96
sphalerite	1	0
zircon {zoned	6	0
{unzoned	28	2
tourmaline {green	9	1
{brown	2	
garnet	5	
leucocene	17	
rutile	1	
Total	1871	100%

Classification Grouping:	Absol. %
Primary Minerals:	<u>99.5</u> %
zircon {zoned	0
{unzoned	.1
tourmaline {green	0
{brown	0
garnet	0
rutile	0
clay aggregates	51.6
feldspar	20
muscovite	.5
quartz	35.3

Light Concentrate	No. of Grains	Rel. %
*chert	68	7.0
clay aggregates	518	53.7
feldspar	20	2.1
muscovite	5	.5
quartz	359	36.7
Total	964	100%

Secondary Minerals:	%
pyrite	3.7
sphalerite	0
leucocene	0
chert	6.7
Total	10.5

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

Limestone 45% soluble; buff to tan; Shale & clay 25-30% in part insoluble residue
of 15% in part probably from above; Sand ± 15%; A; maj. grade 1/2-1/4 m.m.;
Chert ± 3%; opalescent; Pyrite ± 9%
 * (see over)

The chert often occurs as concentric growths of quartz about some nucleus, much of it being true quartz with very wavy extinction rather than crypto-crystalline chert. A good many euhedral quartz grains are present although the ordinarily observed rounded quartz grains with secondary enlargement are not present.

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl $\frac{15}{100}$ %)

1. Sample weight	20.60 gm.	100.0%	F. P.	2. Wt. of
3. Wt. after solution, with filter paper				
4. Less wt. F. P. (2)				
5. Wt. Insol. Residue (3 minus 4)	10.20 gm.	49.5%		
6. Wt. lost by solution (1 minus 5)	10.40 gm.	50.5%		
7. To balance (5 plus 6)	20.60 gm.	100%		

Well No. W— 0117
 Depth 1493 $\frac{1}{2}$ to 1498
 No. samples used 1
 Analyst Scott
 Date 4/4/35

B. Subsidiation:

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	.49	4.9
1-1/2 mm	.83	8.3
1/2-1/4 mm	1.60	16.1
1/4-1/8 mm	2.31	23.2
1/8-1/16	3.03	30.4
Pan	1.70	17.1
Total	9.96	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. } ± 2.93 Sp. gr. Size-Grade(s) $\frac{1}{8}$ - $\frac{1}{16}$ mm.
 Bromoform }

Analyst Pyre
 Date 9/29/35

Wt. of sample 2.98 gm. 100.0% Shape Analysis:

Heavy Minerals 1.10 gm. 3.4% A %: a %: C %
 Light Minerals 2.88 gm. 96.6% r %: R %

Minerals Identified:	No. of Grains	Rel. %	
Heavy Concentrate			
pyrite	420	94	
sphalerite	1	0	
zircon	2	0	
zircon	19	0	
tourmaline	3	1	
tourmaline	12	1	
garnet	7	1	
leucocene	16	0	
Total	980	100%	

Classification Grouping:	Absol. %
Primary Minerals: 67.9%	
zircon { zoned	0
zircon { unzoned	.1
tourmaline { green	0
tourmaline { brown	0
garnet	0
clay aggregates	21.2
feldspar	1.0
muscovite	0
quartz	45.4
Secondary Minerals: 32.3%	
pyrite	3.2
sphalerite	0
leucocene	.1
glaucanite	0
chert	29.0
Total	100%

Light Concentrate		30
* chert	350	22
clay aggregates	252	1
feldspar	17	8
glaucanite	1	47
quartz	559	1175
Total		100%

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

Limestone - $\pm 50\%$; buff. to tan; Shale $\pm 10\%$ green; Sand $\pm 2.5\%$; maj. grade $\frac{1}{8}$ - $\frac{1}{16}$; prio. subsid. $\frac{1}{8}$ - $\frac{1}{16}$; A; Chert, clear to opalescent $\pm 15\%$;
 Pyrite $\pm 3\%$
 * see back of sheet 1492 $\frac{1}{2}$ - 1493 $\frac{1}{2}$

DEEP WELL STUDY

MECHANICAL ANALYSIS

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

- | | |
|--|----------------------|
| 1. Sample weight <u>20.25</u> 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) <u>7.36</u> gm. <u>36.4</u> % | |
| 6. Wt. lost by solution (1 minus 5) <u>12.89</u> gm. <u>63.6</u> % | |
| 7. To balance (5 plus 6) <u>20.25</u> gm. <u>100</u> % | |

B. Subsidiation:

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

Well No. W- D117
 Depth 1498 to 1505 1/2
 No. samples used
 Analyst See
 Date 4/4/35

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2-1 mm	<u>9.50</u>	<u>47.1</u>
1-1/2 mm	<u>1.38</u>	<u>6.8</u>
1/2-1/4 mm	<u>2.11</u>	<u>10.4</u>
1/4-1/8 mm	<u>1.60</u>	<u>7.9</u>
1/8-1/16	<u>1.12</u>	<u>5.5</u>
Pan	<u>.49</u>	<u>2.4</u>
Total	<u>7.20</u>	<u>100.0</u>

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. }
~~Bromoform~~ } ±2.93 Sp. gr. Size-Grade(s) 1/4 - Pan mm.

Wt. of sample 3.25 gm. 100.0% Shape Analysis:

Heavy Minerals13 gm. 4 % A. %: a. %: C. %

Light Minerals 3.12 gm. 96 % r. %: R. %

Minerals Identified; No. of Rel. Classification Grouping: Absol. %
 Heavy Concentrate Grains % Primary Minerals: 66.3 %

pyrite	2100 (est.)	79.2
sphalerite	1	.4
zircon { zoned	8	1.6
{ unzoned	36	1.3
tourmaline { green	6	.2
{ brown	4	.1
{ blue	2	.5
garnet	10	2.6
leucosene	58	.1
rutile	3	.8
titanite	1	.8
carb. and. m.	1	.8
Total	<u>22.30</u>	<u>100%</u>

zircon { zoned	0	0
{ unzoned	1	.1
tourmaline { green	0	0
{ brown	0	0
{ blue	0	0
garnet	0	0
rutile	0	0
titanite	0	0
clay aggregates	25.9	25.9
feldspar	1.0	1.0
muscovite	3	3
quartz	39.8	39.8

Light Concentrate		51
*Chert	213	27
clay aggregates	180	1
feldspar	4	0
muscovite	1	0
*quartz	280	41
Total	<u>678</u>	<u>100%</u>

Secondary Minerals: <u>33.7</u> %	
pyrite	3.1
sphalerite	0
leucosene	.1
carb. and. m.	0
chert	29.8
Total	<u>29.8</u>

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

Limestone - 60-65% ; white to brown, mottled; med. grained; compact; Chert 10-15% ;
clear, opalescent or white; Sand ± 15% A-a; Shale 5-10% ; partly from
above; partly insoluble residue of ls.; Pyrite 4%.

* see over.

The secondary silica in this rock varies from fine grained chert to quartz. Some quartz grains are grown around by chert. Markedly zoned grains of quartz are quite common in which there appear to alternate very thin brownish bands of chert with thicker bands of quartz.



MINER

quartz

secondary silica

chert

Handwritten notes at the bottom of the page, including a signature and date.

DEEP WELL STUDY

MECHANICAL ANALYSIS

- A. Acid treatment (HCl.....%)
2. Wt. of F. P.
- Sample weight 20.00 gm. 100.0%
 - Wt. after solution, with filter paper 8.9 gm.
 - Less wt. F. P. (2) 2.52 gm.
 - Wt. Insol. Residue (3 minus 4) 6.37 gm. 31.9%
 - Wt. lost by solution (1 minus 5) 3.63 gm. 18.1%
 - To balance (5 plus 6) 20.00 gm. 100.0%

- B. Subsidiation:
- Original Wt. gm. 100.0%
 - Cylinder (+1/32) gm. %
 - Jar (1/32—1/64) gm. %
 - Drain gm. %

Well No. W— 0117

Depth 150.3 1/2 to 157.3

No. samples used

Analyst Talley

Date 4/8/35

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2-1 mm	<u>.17</u>	<u>2.7</u>
1-1/2 mm	<u>.72</u>	<u>11.3</u>
1/2-1/4 mm	<u>1.53</u>	<u>24.0</u>
1/4-1/8 mm	<u>1.44</u>	<u>22.6</u>
1/8-1/16	<u>1.25</u>	<u>19.6</u>
Pan	<u>1.26</u>	<u>19.8</u>
Total	<u>6.37</u>	<u>100.0</u>

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. }
 Bromoform } 9.3 Sp. gr. Size—1/4-Pan Grade(s) 1/4-Pan mm.

Analyst Pyre

Date 4/29/35

Wt. of sample 3.09 gm. 100.0%

Heavy Minerals :17 gm. 5.5%

Light Minerals 2.92 gm. 94.5%

Minerals Identified:

Heavy Concentrate	No. of Grains	Rel. %
* brookite	1	0%
* pyrite	2000 (est)	78.5
sphalerite	15	1
zircon { zoned	9	1
zircon { unzoned	52	7
tourmaline { green	13	1
tourmaline { brown	5	1
tourmaline { blue	0	0
garnet	2	0
leucocane	12	2
rutile	1	0
amphibole	3	0
anatase	3	0
Total	<u>7111</u>	<u>100%</u>

Classification Grouping:

Primary Minerals:	Absol. %
zircon { zoned	0
zircon { unzoned	0
tourmaline { green	0
tourmaline { brown	0
tourmaline { blue	0
garnet	0
rutile	0
amphibole	0
clay aggregates	39.7
feldspar	.9
quartz	34.1
brookite	0
Secondary Minerals:	<u>25.3</u> %
pyrite	5.4
sphalerite	0
leucocane	0
anatase	0
chert	19.9
glauconite	0
Total	<u>100%</u>

Light Concentrate

* chert	196	21
clay aggregates	392	42
feldspar	6	1
glauconite	1	0
* quartz	328	36
Total	<u>923</u>	<u>100%</u>

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

Limestone - 65-70%; cream to brown; fine to med. grained; firm; Chert 10-15%;
Qtz. sand ± 5%; shale (caving) 10-15%;

* (see over)

Pyrite occurs principally in minute grains. Some of these have curious flattened spiral shapes, suggesting filings from some brass object.

The size grade used does not make account of the light concentrate indicative of the composition of the sample, particularly because the $\frac{1}{16}$ - Pan grade which is present tends to obscure any count on larger grains.

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl $\frac{10}{100}$ %)

1. Sample weight 20.00 gm. 100.0%: F. P. _____
2. Wt. of _____
3. Wt. after solution, with filter paper 7.36 gm.
4. Less wt. F. P. (2) 2.17 gm.
5. Wt. Insol. Residue (3 minus 4) 5.19 gm. 25.9%
6. Wt. lost by solution (1 minus 5) 14.81 gm. 74.1%
7. To balance (5 plus 6) 20.00 gm. 100.0%

B. Subsidiary:

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

Well No. W- 0117

Depth 157.3 to 1522

No. samples used 3

Analyst Talley

Date 4/2/35

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm		
1/4-1/8 mm		
1/8-1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. } 2.93 Sp. gr. Size- 1/4 - Pan mm.
 Bromoform }

Analyst KUNDETT

Date APR 24-25 1935

Wt. of sample 3.12 gm. 100.0% Shape Analysis:

Heavy Minerals68 gm. 21.8% A. %: a. %: C. %

Light Minerals 2.44 gm. 78.2% r %: R %.

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

Minerals Identified; Heavy Concentrate	No. of Grains	Rel. %	Classification Grouping:	Absol. %
<u>Pyrite</u>	<u>7500 (est)</u>	<u>96</u>	<u>Zircon-Unzoned</u>	<u>0</u>
<u>Zircon-Unzoned</u>	<u>5</u>	<u>0</u>	<u>Tourmaline-Brown</u>	<u>0</u>
<u>Tourmaline-Brown</u>	<u>1</u>	<u>0</u>	<u>Garnet</u>	<u>0</u>
<u>Garnet</u>	<u>1</u>	<u>0</u>	<u>Quartz</u>	<u>32.5</u>
<u>Clay Aggregates</u>	<u>300</u>	<u>4</u>	<u>Clay Minerals</u> ^{heavy}	<u>16.9</u>
Total	7807	100%	Primary Minerals:	50.3%

Light Concentrate	No. of Grains	Rel. %	Classification Grouping:	Absol. %
<u>Chert</u>	<u>442</u>	<u>36.8</u>	<u>Secondary Minerals:</u>	<u>49.7%</u>
<u>Clay Minerals</u>	<u>260</u>	<u>21.6</u>	<u>Pyrite</u>	<u>20.9</u>
<u>Quartz</u>	<u>500</u>	<u>41.6</u>	<u>Chert</u>	<u>28.8</u>

Total 1202 100% Total 100%

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

Ls. - 80%+ medium to dk. brown, med. to fine xline; dense;
Chert 8%+ white to lgt. gray; sand 8%+ fine; Fossiliferous;
pyrite 5%+ anhedral masses.

DEEP WELL STUDY

MECHANICAL ANALYSIS

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

1. Sample weight 16.12 gm. 100.0%: F. P.
2. Wt. of
3. Wt. after solution, with filter paper 6.12 gm.
4. Less wt. F. P. (2) 2.40 gm.
5. Wt. Insol. Residue (3 minus 4) 3.94 gm. 24.4 %
6. Wt. lost by solution (1 minus 5) 12.18 gm. 75.6 %
7. To balance (5 plus 6) 16.12 gm. 100.0 %

B. Subsidiation:

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

Well No. W-0117

Depth 1522 to 1526

No. samples used 1

Analyst Talley

Date 4/8/35

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm		
1/4-1/8 mm		
1/8-1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform. } ±2.93 Sp. gr. Size-Grade(s) 4-900 mm.

Analyst Pyre

Date 9/29/35

Wt. of sample 3.12 gm. 100.0%

Heavy Minerals 13.8 gm. 12.2 %

Light Minerals 2.74 gm. 87.8 %

Shape Analysis:

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

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

Minerals Identified; Heavy Concentrate	No. of Grains	Rel. %
pyrite	19000+	100
zircon {zoned}	2	0
{unzoned}	16	0
tourmaline {green}	9	0
{brown}	3	0
garnet	1	0
leucosene	18	0
rutile	1	0
amphibole	3	0
brookite	1	0
Total	19054	100%

Classification Grouping: Primary Minerals:	Absol. %
zircon {zoned}	0
{unzoned}	0
tourmaline {green}	0
{brown}	0
garnet	0
rutile	0
amphibole	0
brookite	0
clay aggregates	23.7
quartz	19.3

Light Concentrate	Total	100%
chert	295	51
clay aggregates	157	27
glauconite	3	0
quartz	125	22
Total	580	100%

Secondary Minerals:	Total	100%
pyrite	12.2	
leucosene	0	
chert	44.8	
glauconite	0	
Total	57.8	100%

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

Limestone - 76% soluble; buff. to med. brown; med. grains; idens; Chert 10-15%

Clay ± 5%; quartz ± 5%; Pyrite 2-3% in small x-tals.

* (see over)

Brookite grain is located at 19.7 left vernier;
16.4 bottom vernier when slide label to north
is pushed in just even with end of clamps on universal
stage

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl...15.....%)

- | | | | |
|--|-----------|--------|----------------------|
| 1. Sample weight | 20.00 gm. | 100.0% | 2. Wt. of F. P. |
| 3. Wt. after solution, with filter paper | 7.07 gm. | | |
| 4. Less wt. F. P. (2) | 2.96 gm. | | |
| 5. Wt. Insol. Residue (3 minus 4) | 4.61 gm. | 23.1% | |
| 6. Wt. lost by solution (1 minus 5) | 15.39 gm. | 76.9% | |
| 7. To balance (5 plus 6) | 20.00 gm. | 100.0% | |

Well No. W- 0117
 Depth 15.26 to 15.30 ft
 No. samples used
 Analyst T. A. Pyre
 Date 4/8/35

B. Subsidiation:

- | | | |
|-------------------------------|-----|--------|
| 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		
1-1/2 mm		
1/2-1/4 mm		
1/4-1/8 mm		
1/8-1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. }
 Bromoform } 93 Sp. gr. Size-Grade(s) 1/4 - Pan mm.

Analyst Pyre
 Date 9/25/35

Wt. of sample 2.91 gm. 100.0%
 Heavy Minerals 22 gm. 9.1%
 Light Minerals 2.19 gm. 90.9%

Shape Analysis:

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

Minerals Identified:	No. of Grains	Rel. %	
Heavy Concentrate			
pyrite	1200 (est.)	95	
sphalerite	46	4	
zirconiferous	12	1	
leucoxene	7	0	
	1265		

Classification Grouping:	Absol. %
Primary Minerals:	51.9%
zircon	1
clay aggregates	39.1
Feldspar	0
quartz	11.8

Total 100%

Light Concentrate

chert	229	44
clay aggregates	219	43
Feldspar	1	0
quartz	68	13

Secondary Minerals: 47.6%

pyrite	3.6
sphalerite	.4
chert	40.0
leucoxene	0

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

Ls. 77% soluble; buff to med. brown; med. grained; chert ± 12%; dull, earthy, clayey material ± 10% Quartz ± 1% Pyrite 1-2% sphalerite unusually abund. in heavy concentrate.

DEEP WELL STUDY

MECHANICAL ANALYSIS

- A. Acid treatment (HCl $\frac{15}{100}$%)
1. Sample weight 20.00 gm. 100.0%: F. P.
 2. Wt. of
 3. Wt. after solution, with filter paper 10.91 gm.
 4. Less wt. F. P. (2) 2.30 gm.
 5. Wt. Insol. Residue (3 minus 4) 8.11 gm. 40.5%
 6. Wt. lost by solution (1 minus 5) 11.89 gm. 59.4%
 7. To balance (5 plus 6) 20.00 gm. 100.0%

- B. Subsidiation:
1. Original Wt. gm. 100.0%
 2. Cylinder (+1/32) gm. %
 3. Jar (1/32--1/64) gm. %
 4. Drain gm. %

Well No. W- 0117
 Depth 1530 1/2 to 1535 1/2
 No. samples used 1
 Analyst Talley
 Date 4/8/35

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
3/4 1/4 mm	4.85	
1/4-1/8 mm	3.16	
1/8-1/16		
Pan		
Total	8.01	100.0

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) Pan mm.

Analyst KUNDERT
 Date APR. 25, 1935

Wt. of sample 3.11 gm. 100.0% Shape Analysis:
 Heavy Minerals11 gm. 3.5% A.%: a.%: C.%
 Light Minerals 3.00 gm. 96.5% r.%: R.%

Minerals Identified; Heavy Concentrate	No. of Grains	Rel. %	Classification Grouping: Primary Minerals:	Absol. %
Zircon-Unzoned	4	0	Zircon-Unzoned	0
Pyrite	7500 (est)	98	Tourmaline-Green	0
Tourmaline-Green	1	0	" - Brown	0
" - Brown	2	0	Garnets	0
Garnet	5	0	Quartz	44.4
Leucoxene	1	0	Clay Minerals	28.0
Hematite-Scale	120	2		
Total	7633	100%	Secondary Minerals: <u>37.6</u> %	
Light Concentrate			Pyrite	3.4
Chert	340	25	Leucoxene	0
Clay Minerals	400	29	Chert	24.1
Quartz	640	46	Hematite-Scale	.1
Total	1380	100%	Total	100%

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

LS: 60%± buff to dk. brown, med. to finely crystalline, dense;
shale 15%± light gray, calcareous, 60% soluble, waxy, silty,
chert 10%± white, clear; sand 15%±; fossiliferous, pyrite 3%±

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl. 15%)

- | | |
|--|-------------------------|
| 1. Sample weight <u>20.00</u> gm. 100.0% | 2. Wt. of F. P. |
| 3. Wt. after solution, with filter paper <u>11.35</u> gm. | |
| 4. Less wt. F. P. (2) <u>2.30</u> gm. | |
| 5. Wt. Insol. Residue (3 minus 4) <u>9.05</u> gm. <u>45.2</u> % | |
| 6. Wt. lost by solution (1 minus 5) <u>1.05</u> gm. <u>5.2</u> % | |
| 7. To balance (5 plus 6) <u>20.00</u> gm. <u>100.0</u> % | |

Well No. W- 0117
 Depth 15.35 1/2 to 15.45 1/2
 No. samples used 3
 Analyst Talley
 Date 4/8/35

B. Subsidiary:

- | | |
|-------------------------------------|--|
| 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		
1-1/2 mm		
1/2 + 1/4 mm	6.02	
1/4-1/8 mm	2.93	
1/8-1/16		
Pan		
Total	8.95	100.0

S.G.D. Not valid

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. } ±2.93 Sp. gr. Size-Grade(s) 1/4-Pan mm.
~~Bromoform~~ }

Analyst Pyre
 Date 4/25/35

Wt. of sample 2.90 gm. 100.0% Shape Analysis:

Heavy Minerals12 gm. 4.1% A. %: a %: C %
 Light Minerals 2.78 gm. 95.9% r %: R %

Minerals Identified; Heavy Concentrate No. of Grains Rel. % Classification Grouping: Primary Minerals: 37.4% Absol. %

pyrite	1500 (est)	95
sphalerite	67	4
zircon {unzoned}	2	0
zircon {zoned}	9	1
tourmaline {green}	1	0
tourmaline {brown}	2	0
garnet	5	0
rutile	1	0
x	2	0
Total	1589	100%

zircon {zoned}	0	0
tourmaline {green}	0	0
tourmaline {brown}	0	0
garnet	0	0
rutile	0	0
x	0	0
clay aggregates	25.9	0
feldspar	0	0
quartz	12.5	0

Light Concentrate	60	60
Chert	488	27
clay aggregates	221	0
Feldspar	1	13
quartz	102	0
Total	812	100%

Secondary Minerals: <u>61.6</u> %	3.9	3.9
pyrite	0.2	0.2
sphalerite	57.5	57.5

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

Limestone - 55.7% soluble; buff to med. brown; med. to fine grained; dense; Chert
25-30%, white, clear and dark brown; Shale 10-15%; Quartz ±5% A;
Pyrite ±2%. Sphalerite abund in heavy concentrate.

(see over)

Two grains of a dk. brown pleochroic mineral, with ^{or three} two good cleavages
 a refringence of 1.7+ & a ~~moder~~ high birefringence. It is apparently
 of biaxial character. The grains are located at 20.9 & 13.7
 on bottom vernier and 15.7 & 13.7 left vernier.

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl...%)

- | | | | |
|--|-----------|--------|-------------------------|
| 1. Sample weight | 20.00 gm. | 100.0% | 2. Wt. of F. P. |
| 3. Wt. after solution, with filter paper | 10.80 gm. | | |
| 4. Less wt. F. P. (2) | 2.04 gm. | | |
| 5. Wt. Insol. Residue (3 minus 4) | 8.76 gm. | 43.1% | |
| 6. Wt. lost by solution (1 minus 5) | 11.24 gm. | 56.2% | |
| 7. To balance (5 plus 6) | 28.00 gm. | 100.0% | |

Well No. W— 0117
 Depth 1545 1/2 to 1550 1/2
 No. samples used
 Analyst Talley
 Date 4/13/35

B. Subsidiary:

- | | | | |
|-------------------------------|-----|--------|--|
| 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		
1-1/2 mm		
1-1/4 mm	4.82	
1/4-1/8 mm	3.80	
1/8-1/16		
Pan		
Total	8.62	100.0

S.G.D. Not valid

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } 12.9 Sp. gr. Size-Grade(s) Pan mm.

Analyst Pyre
 Date 9/5/35

Wt. of sample gm. 100.0%

Heavy Minerals 1.20 gm. 5.2%

Light Minerals 3.66 gm. 94.5%

Shape Analysis:

A %: a %: C %

r %: R %

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

Classification Grouping: Primary Minerals: 36.0% Absol. %

pyrite	2000	98
sphalerite	92	2
zircon-oxoed	7	0
tourmaline { green	2	0
{ blue	1	0
2052		

zircon	0
tourmaline { green	0
{ brown	0
Clay aggregates	17.0
quartz	19.0

Total 100%

Light Concentrate

Chert	401	62
clay aggregates	118	18
quartz	130	20
649		

Secondary Minerals: 64.0%

pyrite	6.1
sphalerite	1
Chert	58.8

Total 100% Total 100%

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

Limestone — 56% soluble; light to dark brown; med. grained; granular; Chert 25-30%; white to light brown, mottled; Clay aggregates 10-15%; Quartz 5-10%; A; same euhedral totals; 2-3% Pyrite

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15%)

- | | | | | |
|--|------------------|----------------|-------------------------|--|
| 1. Sample weight | <u>20.00</u> gm. | 100.0% | 2. Wt. of F. P. | |
| 3. Wt. after solution, with filter paper | <u>12.14</u> gm. | | | |
| 4. Less wt. F. P. (2) | <u>2.27</u> gm. | | | |
| 5. Wt. Insol. Residue (3 minus 4) | <u>9.87</u> gm. | <u>49.3</u> % | | |
| 6. Wt. lost by solution (1 minus 5) | <u>10.13</u> gm. | <u>50.7</u> % | | |
| 7. To balance (5 plus 6) | <u>20.00</u> gm. | <u>100.0</u> % | | |

B. Subsidiary:

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

Well No. **W-0117**

Depth 1550' to 1555'

No. samples used

Analyst T. Hall

Date 4/8/35

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
3/4 1/4 mm	<u>6.50</u>	
1/4-1/8 mm	}	3.28
1/8-1/16		
Pan		
Total	<u>7.78</u>	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

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

Analyst KUNDETT
Date APR 26, 1935

Wt. of sample	<u>3.24</u> gm.	100.0%	Shape Analysis:	
Heavy Minerals	<u>.14</u> gm.	<u>4.3</u> %	A %	a %
Light Minerals	<u>3.10</u> gm.	<u>95.7</u> %	r %	R %

Minerals Identified: Heavy Concentrate

	No. of Grains	Rel. %	Classification Grouping:	Absol. %
			Primary Minerals: <u>59.0%</u>	

Pyrite	540	94	Quartz	37.8
Sphalerite	3	.5	Clay Minerals heavy	.6
Leucosene	3	.5	Clay Minerals light	21.1
Chlorite	2	.3		
Clay Aggregates	95	14.7		

Total 643 100%

Light Concentrate			Secondary Minerals: <u>41.0%</u>	
Chert	566	39	Sphalerite	0
Clay Minerals	316	22	Chlorite	0
Quartz	560	39	Leucosene	3.6
			Pyrite	37.4
			Chert	37.4

Total 1442 100% Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).
ls: 50% ± light to dark brown; med. crystalline, granular; Chert, 15% white to dark brown, mottled; sand, 15% ± A. Fine; Pyrite 3% ±; Green + gray shale caving -

S.G. D. Not Valid

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl 65%)

1. Sample weight	20.00 gm.	100.0%	2. Wt. of F. P.
3. Wt. after solution, with filter paper	11.75 gm.		
4. Less wt. F. P. (2)	2.12 gm.		
5. Wt. Insol. Residue (3 minus 4)	9.63 gm.	48.1%	
6. Wt. lost by solution (1 minus 5)	10.37 gm.	51.9%	
7. To balance (5 plus 6)	20.0 gm.	100.0%	

B. Subsidiation:

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

Well No. W- 0117

Depth 1555 1/4 to 1557 1/2

No. samples used:

Analyst Talley

Date 4/8/35

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
3/4-1/4 mm	6.42	
1/4-1/8 mm	3.21	
1/8-1/16		
Pan		
Total	9.63	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } 93 Sp. gr. Size-Grade(s) 1/4 - Pan mm.

Wt. of sample 3.23 gm. 100.0%

Heavy Minerals 19 gm. 4.3 %

Light Minerals 3.09 gm. 95.7 %

Minerals Identified:	No. of Grains	Rel. %
Heavy Concentrate		
pyrite	2000 (est)	99
sphalerite	27	1
zircon-encased	5	
garnet	1	
2033		

Shape Analysis:

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

Classification Grouping:

Primary Minerals: 22.0 %

Absol. %

zircon-encased	1
garnet	0
clay aggregates	12.4
feldspar	0
*quartz	7.1

Total 100%

Light Concentrate		
chert	668	97
clay aggregates	114	13
feldspar	4	0
glaucosite	2	0
*quartz	84	10

Secondary Minerals: 78.0 %

pyrite	4.3
sphalerite	0
chert	13.7
glaucosite	0

Total 8.72 100%

Total 100%

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

Limestone = 5.2% soluble; buff to light brown; med. grained; granular; Chert ± 35%; white to light brown, mottled; Quartz 4-5%; A; Clay aggregates ± 10%; Pyrite ± 2%

* (see over)

S.G.D. Not valid

The quartz in this sample is placed in the primary grouping. However, the greater percentage of it is more likely of secondary origin. This is shown by the mottled, brownish unabraded surfaces of the grains, by their extreme angularity and their tendency toward an undulatory extinction.

Some quartz is detrital nevertheless.

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15%)

1. Sample weight 20.00 gm. 100.0% : F. P. _____

2. Wt. of _____

3. Wt. after solution, with filter paper 12.54 gm.

4. Less wt. F. P. (2) 2.32 gm.

5. Wt. Insol. Residue (3 minus 4) 10.22 gm. 51.1%

6. Wt. lost by solution (1 minus 5) 9.78 gm. 48.9%

7. To balance (5 plus 6) 20.00 gm. 100.0%

Well No. W- 0117

Depth 1557 1/2 to 1565 1/2

No. samples used 2

Analyst Talley

Date 4/8/35

B. Subsidiation:

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		
1-1/2 mm		
1 1/4 mm	<u>5.23</u>	<u>51.5</u>
1/4-1/8 mm	<u>4.92</u>	<u>48.5</u>
1/8-1/16		
Pan		
Total	<u>10.15</u>	<u>100.0</u>

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-Pan mm.

Analyst Pyre

Date 7/25/35

Wt. of sample 4.95 gm. 100.0% Shape Analysis:

Heavy Minerals16 gm. 3.2% A. %: a %: C %

Light Minerals 4.79 gm. 96.8% r %: R %

Minerals Identified:	No. of Grains	Rel. %
Heavy Concentrate		
pyrite	<u>2000</u>	<u>97</u>
sphalerite	<u>52</u>	<u>3</u>
zircon	<u>7</u>	<u>0</u>
zircon	<u>10</u>	<u>0</u>
tourmaline green	<u>4</u>	<u>0</u>
garnet	<u>1</u>	<u>0</u>
leucosene	<u>1</u>	<u>0</u>
rutile	<u>1</u>	<u>0</u>
epidote	<u>1</u>	<u>0</u>
Total	<u>2071</u>	<u>100%</u>

Classification Grouping:	Absol. %
Primary Minerals:	<u>2.52</u> %
zircon zoned	
zircon	
tourmaline green	
garnet	
rutile	
epidote	
quartz	<u>9.7</u>
clay aggregates	<u>15.5</u>

Light Concentrate	No. of Grains	Rel. %
chert	<u>579</u>	<u>74</u>
clay aggregates	<u>123</u>	<u>11</u>
* quartz	<u>82</u>	<u>11</u>
glauconite	<u>3</u>	<u>0</u>
Total	<u>787</u>	<u>100%</u>

Secondary Minerals:	Absol. %
pyrite	<u>3.1</u>
sphalerite	<u>.1</u>
leucosene	
chert	<u>91.6</u>
quartz	
Total	<u>100%</u>

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

Limestone - ±50% soluble; buff to light brown; med. grained; granular; Chert 30-40%; white to light brown; mottled; Clay aggregates ±10%; Quartz ±5%; Pyrite 1-2%

* see back of sheet 1555 1/2 - 1557 1/2

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl. 15%)

2. Wt. of F. P. _____

1. Sample weight 20.00 gm. 100.0%

3. Wt. after solution, with filter paper 12.88 gm.

4. Less wt. F. P. (2) 2.22 gm.

5. Wt. Insol. Residue (3 minus 4) 10.66 gm. 53.3%

6. Wt. lost by solution (1 minus 5) 9.34 gm. 46.7%

7. To balance (5 plus 6) 20.00 gm. 100.0%

Well No. W— W117

Depth 15.65 m to 15.71 m

No. samples used. 1

Analyst Talley

Date 4/2/35

B. Subsidiary:

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		
1-1/2 mm		
3/4 1/4 mm	<u>6.81</u>	<u>64.5</u>
1/4-1/8 mm	<u>3.74</u>	<u>35.5</u>
1/8-1/16		
Pan		
Total	<u>10.55</u>	<u>100.0</u>

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. } ± 2.93 Sp. gr. Size-Grade(s) 1/4 - Pan mm.

Bromoform }

Analyst Pyre

Date 9/26/35

Wt. of sample 3.81 gm. 100.0% Shape Analysis:

Heavy Minerals12 gm. 3 % A % : a % : C %

Light Minerals 3.59 gm. 97 % r % : R %

Minerals Identified;	No. of Grains	Rel. %	Classification Grouping:	Absol. %
Heavy Concentrate			Primary Minerals: <u>14.2</u> %	
pyrite	<u>1500</u>	<u>98.6</u>	Zircon-umixed	.0
Sphalerite	<u>21</u>	<u>1.4</u>	tourmaline-green	.0
Zircon-umixed	<u>1</u>	<u>.2</u>	Ambigolite	.0
tourmaline-green	<u>1</u>	<u>.2</u>	Clay aggregates	<u>11.2</u>
Ambigolite	<u>2</u>	<u>.2</u>	Feldspar	<u>.2</u>
	<u>1526</u>		Quartz (20%)	<u>1.8</u>
Total		<u>100%</u>		

Light Concentrate	No. of Grains	Rel. %	Secondary Minerals:	Absol. %
Chert	<u>481</u>	<u>76.8</u>	Pyrite	<u>3.0</u>
Clay aggregates	<u>72</u>	<u>11.5</u>	Sphalerite	<u>.0</u>
Feldspar	<u>1</u>	<u>.2</u>	Chert	<u>74.4</u>
*Quartz	<u>72</u>	<u>11.5</u>	Quartz (80%)	<u>8.4</u>
Total	<u>626</u>	<u>100%</u>	Total	<u>100%</u>

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

Limestone - 97% soluble; med. to dk. brown; red grained; granular; Chert, white to light brown, ± 9.0%; Quartz 5-10%; Clay aggregates 5-10%; Pyrite 1-2% [glauconite not observed].

see two previous sheets.

S.G.D. Not valid

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl. 15%)

- | | | | | |
|--|------------------|----------------|-------------------------|--|
| 1. Sample weight | <u>20.27</u> gm. | 100.0% | 2. Wt. of F. P. | |
| 3. Wt. after solution, with filter paper | <u>13.91</u> gm. | | | |
| 4. Less wt. F. P. (2) | <u>2.30</u> gm. | | | |
| 5. Wt. Insol. Residue (3 minus 4) | <u>7.161</u> gm. | | | |
| 6. Wt. lost by solution (1 minus 5) | <u>8.66</u> gm. | <u>42.6</u> % | | |
| 7. To balance (5 plus 6) | <u>0.27</u> gm. | <u>100.0</u> % | | |

B. Subsidiation:

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

Well No. W— 0117
 Depth 1571 1/2 to 1575
 No. samples used. 1
 Analyst Scott
 Date 4/4/35

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1-1/4 mm	<u>9.00</u>	<u>17.8</u>
1/4-1/8 mm	<u>2.58</u>	<u>22.2</u>
1/8-1/16		
Pan		
Total	<u>11.58</u>	<u>100.0</u>

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } ± 2.93 Sp. gr. Size-Grade(s) 1/4 - Pan mm.

Analyst Pyre
 Date 4/26/35

Wt. of sample 2.59 gm. 100.0%
 Heavy Minerals 0.03 gm. 1 %
 Light Minerals 2.51 gm. 99 %

Shape Analysis:

A. % : a. % : C. %
 r % : R 19.0 %

Minerals Identified:	No. of Grains	Rel. %
Heavy Concentrate		
pyrite	<u>1800</u> est.	<u>98.9</u>
sphalerite	<u>5</u>	<u>.6</u>
leucocene	<u>3</u>	<u>.4</u>
chlorite	<u>1</u>	<u>.1</u>
<u>809</u>		

Classification Grouping:	Absol. %
Primary Minerals: %	
chlorite	
Clay aggregates	<u>18.8</u>
Feldspar	<u>.2</u>

Total		100%
Light Concentrate		
chert	<u>469</u>	<u>76.0</u>
clay aggregates	<u>119</u>	<u>19.4</u>
Feldspar	<u>1</u>	<u>.2</u>
glauconite	<u>3</u>	<u>.5</u>
quartz	<u>29</u>	<u>3.9</u>
Total	<u>616</u>	<u>100%</u>

Secondary Minerals: <u>8.1</u> %	3.0
pyrite	
sphalerite	
leucocene	<u>73.7</u>
chert	<u>.5</u>
glauconite	<u>3.8</u>
quartz	
Total	<u>100%</u>

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

Limestone - 43% soluble; gray to gray-brown; med. to fine grained; earthy texture; zones argillaceous; very fossiliferous; very thin beds; Chert ± 40%; grey, milky with numerous clayey & organic inclusions; Clay aggregates ± 10%; Glauconite present; 11% Pyrite

S.G. D. Not valid

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15%)

1. Sample weight 20.32 gm. 100.0%: 2. Wt. of F. P.

3. Wt. after solution, with filter paper 12.82 gm.

4. Less wt. F. P. (2) 2.11 gm.

5. Wt. Insol. Residue (3 minus 4) 10.71 gm. 52 %

6. Wt. lost by solution (1 minus 5) 9.61 gm. 47.2 %

7. To balance (5 plus 6) 20.32 gm. 100.0 %

B. Subsidiation:

1. Original Wt. gm. 100.0%

2. Cylinder (+1/32) gm. %

3. Jar (1/32—1/64) gm. %

4. Drain gm. %

Well No. W— 0117

Depth 1575 to 1578 1/2

No. samples used

Analyst Scott

Date 4/8/35

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
3/4 1/4 mm	<u>6.46</u>	<u>60.8</u>
1/4-1/8 mm	<u>4.16</u>	<u>39.2</u>
1/8-1/16		
Pan		
Total	<u>10.62</u>	<u>100.0</u>

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } ± 2.93 Sp. gr. Size-Grade(s) 1/4 Pan mm.

Analyst KUNDERT

Date APR 29, 1935

Wt. of sample 4.17 gm. 100.0% Shape Analysis:

Heavy Minerals 1.8 gm. 3.4 % A. %: a %: C %

Light Minerals 4.03 gm. 96.6 % r %: R %

Minerals Identified:	No. of Grains	Rel. %	Classification Grouping:	Absol. %
Heavy Concentrate			Primary Minerals: <u>14.5</u> %	
Pyrite	<u>3000 (est)</u>	<u>97.9</u>	Zircon-Unzoned - -	
Sphalerite	<u>5</u>	<u>.3</u>	Tourmaline-Green - -	
Zircons-Unzoned	<u>8</u>	<u>.3</u>	" - Brown - -	
Tourmaline-Green	<u>1</u>	<u>.0</u>	Garnet - -	
" - Brown	<u>1</u>	<u>.0</u>	Clay Aggregates - -	<u>14.5</u>
Garnet	<u>5</u>	<u>.0</u>	Feldspars - -	
Leucosene	<u>15</u>	<u>.0</u>		
Scale	<u>15</u>	<u>.0</u>		
Clay Aggregates	<u>12</u>	<u>.4</u>		
Total	<u>3062</u>	<u>100%</u>		

Light Concentrate	No. of Grains	Rel. %	Secondary Minerals: <u>85.5</u> %	Absol. %
Chert	<u>570</u>	<u>49</u>	Pyrite - -	<u>3.3</u>
Clay Minerals	<u>174</u>	<u>15</u>	Sphalerite - -	<u>.0</u>
Feldspars	<u>4</u>	<u>0</u>	Leucosene - -	<u>.0</u>
Quartz	<u>420</u>	<u>36</u>	Chert - -	<u>47.4</u>
			Quartz - -	<u>34.8</u>
Total	<u>1168</u>	<u>100%</u>	Total scale - -	<u>100%</u>

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

ls + chert: ls grey to brown + dark brown 45%±; chert milky to gray and buff 25%±; quartz 20%±; ls medium coarse to coarse staline; chert dense to coarse texture; all very fossiliferous; drusy quartz + calcite; pyrite 20%± (glauconite not observed).

S.G.D. Not valid

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl. 15.....%)

- | | |
|--|----------------------|
| 1. Sample weight <u>20.46</u> gm. | 2. Wt. of F. P. |
| 3. Wt. after solution, with filter paper <u>12.26</u> gm. | |
| 4. Less wt. F. P. (2) <u>2.22</u> gm. | |
| 5. Wt. Insol. Residue (3 minus 4) <u>10.04</u> gm. <u>49.1</u> % | |
| 6. Wt. lost by solution (1 minus 5) <u>10.42</u> gm. <u>50.9</u> % | |
| 7. To balance (5 plus 6) <u>20.46</u> gm. <u>100.0</u> % | |

Well No. W-- 0117
 Depth 1578 1/2 to 1581 1/2
 No. samples used 1
 Analyst Scott
 Date 4/8/35

B. Subsidiary:

- | | |
|--|--|
| 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		
1-1/2 mm		
3/4 1/4 mm	6.81	(8.1)
1/4-1/8 mm	3.19	31.9
1/8-1/16		
Pan		
Total	10.00	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-Pan mm.

Analyst Pyre
 Date 9/26/35

Wt. of sample 3.18 gm. 100.0%
 Heavy Minerals18 gm. 5.6%
 Light Minerals 3.00 gm. 94.4%

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

Minerals Identified; Heavy Concentrate	No. of Grains	Rel. %
pyrite	2000(est.)	99.8
sphalerite	21	.1
zircon. unsorted	13	.1
garnet	1	.1
chlorite	1	.1
<u>2036</u>		

Classification Grouping: Primary Minerals:	Absol. %
zircon. unsorted	.1
garnet	.1
chlorite	.1
clay aggregates	14.2
<u>14.2</u>	

Total	100%
Light Concentrate	
chert	609 74.0
clay aggregates	123 15.0
glauconite	5 .6
quartz	85 10.4
Total	822 100%

Secondary Minerals: <u>8.5</u> %	
pyrite	5.6
sphalerite	.0
chert	69.8
glauconite	9.8
quartz	100%

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

Limestone - 51% soluble; grey to brown; Chert ± 9.0% milky to grey; coarse
 crypto-crystalline; full of inclusions; Clay aggregates 5-10%; Quartz ± 5%; all
 secondary; Pyrite 2-3%; Glauconite present;

DEEP WELL STUDY

MECHANICAL ANALYSIS

- A. Acid treatment (HCl. 15.....%)
1. Sample weight 20.63 gm. 100.0%: 2. Wt. of F. P.
 3. Wt. after solution, with filter paper 13.07 gm.
 4. Less wt. F. P. (2) 7.56 gm.
 5. Wt. Insol. Residue (3 minus 4) 10.58 gm. 51.2 %
 6. Wt. lost by solution (1 minus 5) 0.05 gm. 48.8 %
 7. To balance (5 plus 6) 20.63 gm. 100.0 %

Well No. W— 0117
 Depth 1581½ to 1584½
 No. samples used 1
 Analyst Scott
 Date 4/8/35

- B. Subsidiary:
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		
3/4 + ¼ mm	8.39	
¼-⅛ mm		
⅛-1/16	2.20	
Pan		
Total	10.59	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. }
 Bromoform } 2.93 Sp. gr. Size-Grade(s) ¼ - Pan mm.

Analyst KUNDEERT
 Date APR 29 1935

Wt. of sample 2.15 gm. 100.0% Shape Analysis:

Heavy Minerals07 gm. 3.3 % A. %: a %: C %

Light Minerals 2.08 gm. 96.7 % r %: R %

Minerals Identified;	No. of Grains	Rel. %	Classification Grouping:	Absol. %
Heavy Concentrate			Primary Minerals: <u>33.8</u> %	
Pyrite	620	77.0	Zircons-Unzoned	
Zircon-Unzoned	1	0.1	Spinel	
Leucoxene	9	1.1	Clay Minerals	27.9
Spinel	1	0.1	Quartz-(50%+)	5.3
Clay Aggregates	145	18.0	Clay Agg.	0.6
Scale	30	3.7		
Total	806	100%		
Light Concentrate			Secondary Minerals: <u>66.2</u> %	
Chert	525	60.3	Pyrite	2.5
Clay Minerals	250	28.8	Leucoxene	58.9
Quartz	95	10.9	Chert	5.3
			Quartz (50%+)	5.3
			Scale	
Total	870	100%	Total	*100%

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

ls, chert + quartz; ls 50%+; pyrite 1%+; chert 30%+;
quartz 15%+; fossiliferous; (trace of glauconite found)*

*over

S.G. Dr. Not valid

1 fragment of glaucouite found in 3 mounts
of light aggregates, giving glaucouite percentage
of approximately 1 fragment in 1500
grains of light
Kondert

DEEP WELL STUDY

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 7.35 gm.

4. Less wt. F. P. (2) 2.08 gm.

5. Wt. Insol. Residue (3 minus 4) 5.27 gm. 25.7 %

6. Wt. lost by solution (1 minus 5) 15.21 gm. 74.3 %

7. To balance (5 plus 6) 20.48 gm. 100.0 %

Well No. W— 0117

Depth 1584 1/2 to 1587 1/2

No. samples used 1

Analyst Scott

Date 9/21/35

B. Subsidiation:

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		
1-1/2 mm		
1/2-1/4 mm		
1/4-1/8 mm		
1/8-1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } ±2.93 Sp. gr. Size-Grade(s) 1/4 - Pan mm.

Analyst Pyre

Date 9/26/35

Wt. of sample 2.18 gm. 100.0% Shape Analysis:

Heavy Minerals11 gm. 5 % A. %: a. %: C. %

Light Minerals09 gm. 95 % r %: R %.

Minerals Identified:	No. of Grains	Rel. %	Classification Grouping:	Absol. %
Heavy Concentrate			Primary Minerals: <u>29.4</u> %	
Pyrite	1800 est.	98.8	tourmaline-green	.0
sphalerite	5	.6	clay aggregates	29.4
tourmaline-green	1	.1		
leucocene	3	.4		
Carborundum	1	.1		

Total 81.0 100%

Light Concentrate		
Chert	522	59.7
clay aggregates	270	30.9
glauconite	4	.5
quartz	78	8.9

Secondary Minerals:		
Quartz	20.6	8.4
Pyrite		5.0
sphalerite		.0
leucocene		.0
Carborundum		5.4
Chert		100%
glau		

Total 87.4 100% Revised Lithologic Description (from descriptive log and laboratory data).

Limestone - 74% soluble; Chert ± 15%, grey to milky, numerous inclusions.

Clay aggregates 5-10%; Quartz ± 5% secondary; Pyrite 1-2%

Glauconite present

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl...1.5%...%)

- | | | | | |
|--|-----------|--------|-------------------------|--|
| 1. Sample weight | 20.00 gm. | 100.0% | 2. Wt. of F. P. | |
| 3. Wt. after solution, with filter paper | 7.36 gm. | | | |
| 4. Less wt. F. P. (2) | 2.51 gm. | | | |
| 5. Wt. Insol. Residue (3 minus 4) | 4.8 gm. | 24.3% | | |
| 6. Wt. lost by solution (1 minus 5) | 1.515 gm. | 7.57% | | |
| 7. To balance (5 plus 6) | 20.00 gm. | 100.0% | | |

Well No. W— 0117
 Depth 1587 1/2 to 1591 1/2
 No. samples used 2
 Analyst Talley
 Date 4/9/35

B. Subsidiary:

- | | | | | |
|-------------------------------|-----|--------|--|--|
| 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		
1-1/2 mm		
1/2-1/4 mm		
1/4-1/8 mm		
1/8-1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. }
 Bromoform } 12.93 Sp. gr. Size-Grade(s) 1/4 - Pan mm.

Analyst KUNDERT
 Date APR 26 1935

Wt. of sample 2.51 gm. 100.0% Shape Analysis:
 Heavy Minerals 16 gm. 6 % A %: a %: C %
 Light Minerals 2.35 gm. 94 % r %: R %

Minerals Identified: No. of Grains Rel. % Classification Grouping: Absol. %
 Heavy Concentrate Primary Minerals: 48.5 %

Mineral	No. of Grains	Rel. %	Classification	Absol. %
Pyrite	1325	94.4	Zircon-Unzoned	.0
Zircon-Unzoned	1	.1	Clay Minerals	11.1
Sphalerite	5	.4	Quartz	37.2
Clay Aggregates	38	2.7	Clay Aggregates	.2
Scale	33	2.4		
Total	1402	100%		

Mineral	No. of Grains	Rel. %	Classification	Absol. %
Light Concentrate				
Chert	430	48.6	Secondary Minerals: <u>51.5</u> %	5.7
Clay Minerals	104	11.8	Pyrite	.1
Quartz	350	39.6	Sphalerite	.1
			Clays	45.7
			Scale	
			Chert	
Total	884	100%	Total	100%

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

ls: 75% buff medium x talline, firm; chert 100%+ white milky and black + white mottled; fossiliferous; 4%+ pyrite, glauconite

DEEP WELL STUDY

MECHANICAL ANALYSIS

- A. Acid treatment (HCl...%)
1. Sample weight 20.00 gm. 100.0%: F. P. _____
2. Wt. of
3. Wt. after solution, with filter paper 8.40 gm.
4. Less wt. F. P. (2) 2.41 gm.
5. Wt. Insol. Residue (3 minus 4) 5.99 gm. 29.9%
6. Wt. lost by solution (1 minus 5) 14.01 gm. 70.1%
7. To balance (5 plus 6) 20.00 gm. 100.0%

Well No. W-0117

Depth 159 1/2 to 160.0

No. samples used 3

Analyst Talley

Date 4/9/35

- B. Subsidiary:
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		
1-1/2 mm		
3/4 1/4 mm	<u>4.05</u>	<u>68.4</u>
1/4-1/8 mm	<u>1.87</u>	<u>31.5</u>
1/8-1/16		
Pan		
Total	<u>5.92</u>	<u>100.0</u>

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } 2.93 Sp. gr. Size-Grade(s) 1/4 - Pan mm.

Analyst Pyre

Date 9/26/35

Wt. of sample 2.88 gm. 100.0% Shape Analysis:

Heavy Minerals 1.09 gm. 3 % A. %: a %: C %

Light Minerals 2.79 gm. 97 % r %: R %

Minerals Identified:	No. of Grains	Rel. %	Classification Grouping:	Absol. %
Heavy Concentrate			Primary Minerals: <u>43.2</u> %	
pyrite	<u>500</u>	<u>99.6</u>	zircon-unzoned	
zircon-unzoned	<u>1</u>	<u>.2</u>	tourmaline-green	
tourmaline-green	<u>1</u>	<u>.2</u>	clay aggregates	<u>43.2</u>
	<u>502</u>			

Total		100%		
Light Concentrate			Secondary Minerals: <u>56.8</u> %	
chert	<u>384</u>	<u>48.2</u>	pyrite	<u>2.0</u>
clay aggregates	<u>353</u>	<u>44.5</u>	chert	<u>46.7</u>
glauconite	<u>3</u>	<u>.4</u>	glauconite	<u>.4</u>
quartz	<u>55</u>	<u>6.9</u>	quartz	<u>6.7</u>
Total	<u>795</u>	100%	Total	100%

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

Limestone - 70% soluble - cream to buff; med grained; ±20% chert white, milky, with many inclusions; ±10% gray shale (sanded?) Quartz 2-3% Pyrite ±1%; Glauconite present

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15%)

1. Sample weight 20.62 gm. 100.0%: F. P. _____

2. Wt. of _____

3. Wt. after solution, with filter paper 9.95 gm.

4. Less wt. F. P. (2) 2.25 gm.

5. Wt. Insol. Residue (3 minus 4) 7.70 gm. 37.3%

6. Wt. lost by solution (1 minus 5) 12.92 gm. 62.7%

7. To balance (5 plus 6) . 20.62 gm. 100.0%

Well No. W— 0117

Depth 1600 to 1608 1/2

No. samples used 3

Analyst Pennel

Date 5/17/35

C. Screen Analysis 7.70

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	<u>5.99</u>	<u>76.</u>
1/4-1/8 mm	<u>1.00</u>	<u>12.</u>
1/8-1/16	<u>.56</u>	<u>7.1</u>
Pan	<u>.33</u>	<u>4.2</u>
Total	<u>7.89</u>	<u>100.0</u>

B. Subsidiation:

1. Original Wt. gm. 100.0%

2. Cylinder (+1/32) gm. %

3. Jar (1/32-1/64) gm. %

4. Drain gm. %

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. } 2.92 Sp. gr. Size-Grade(s) 1/4 Pan mm.

Bromoform }

Analyst Filasata

Date June 5 - 1935

Wt. of sample 1.65 gm. 100.0% Shape Analysis:

Heavy Minerals gm. 10.0% A. _____%: a. _____%: C. _____%

Light Minerals 1.45 gm. 90.0% r. _____%: R. _____%

Minerals Identified:	No. of Grains	Rel. %	Classification Grouping:	Absol. %
Heavy Concentrate			Primary Minerals: _____%	
<u>Pyrite</u>	<u>426</u>	<u>87.3</u>	<u>Leucocane</u>	<u>0.0</u>
<u>Limonite Ag</u>	<u>59</u>	<u>12.1</u>	<u>quartz</u>	<u>12.0</u>
<u>Leucocane</u>	<u>2</u>	<u>0.6</u>	<u>clay minerals</u>	<u>58.0</u>
			<u>Feldspars</u>	<u>0.1</u>
Total	<u>88</u>	<u>100%</u>		

Light Concentrate	Secondary Minerals: _____%
<u>quartz</u>	<u>13.3</u>
<u>clay minerals</u>	<u>64.5</u>
<u>chert</u>	<u>22.2</u>
<u>Feldspars</u>	<u>0.0</u>
Total	<u>90.2</u>

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

L.S. 80% to 1st bf to 1st grey x line; Chert 20% wh. Milky tr. Leucocane fossils

DEEP WELL STUDY

MECHANICAL ANALYSIS

- A. Acid treatment (HCl 15%)
1. Sample weight 20.32 gm. 100.0%: F. P. 2.21
2. Wt. of
3. Wt. after solution, with filter paper 7.93 gm.
4. Less wt. F. P. (2) gm.
5. Wt. Insol. Residue (3 minus 4) 12.39 gm. 28.1%
6. Wt. lost by solution (1 minus 5) 14.60 gm. 71.9%
7. To balance (5 plus 6) 0.32 gm. 100.0%

Well No. W- 0117

Depth 1608 1/2 to 1615 1/2

No. samples used 1

Analyst Pennel

Date 5/15/35

- B. Subsidiary:
1. Original Wt. gm. 100.0%
2. Cylinder (+1/32) gm. %
3. Jar (1/32-1/64) gm. %
4. Drain gm. %

C. Screen Analysis 5.74

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	<u>4.17</u>	<u>36.6</u>
1/4-1/8 mm	<u>1.00</u>	<u>8.8</u>
1/8-1/16	<u>.52</u>	<u>4.5</u>
Pan	<u>5.69</u>	<u>50.0</u>
Total	<u>11.38</u>	<u>100.0</u>

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. } 2.93± Sp. gr. Size- 1/400 mm.
 Bromoform }

Analyst Filasota

Date June 7-35

Wt. of sample gm. 100.0% Shape Analysis:

Heavy Minerals gm. 6.7% A. %: a. %: C. %

Light Minerals 1.40 gm. 93.3% r. %: R. %

Minerals Identified;	No. of Grains	Rel. %	Classification Grouping:	Absol. %
Heavy Concentrate			Primary Minerals: <u>53.6</u> %	
Andalusite	1	0.1	Andalusite	
Barite	60	9.3	Barite	0.6
Pyrite	500	77.9	Leucophaea	0.0
Limonite Agg.	80	12.4	quartz	14.3
	2	0.3	Feldspar	0.1
			clay Minerals	38.6
Total	<u>643</u>	<u>100%</u>		
Light Concentrate			Secondary Minerals: <u>46.4</u> %	
quartz	160		Pyrite	5.2
clay Mineral	431	41.3	Limonite Agg.	0.8
chert	452	43.3	chert	40.4
Feldspar	1	0.1		
Total	<u>1044</u>	<u>100%</u>	Total	<u>100%</u>

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

LS, 85% ± lt bf to lt gry, med to fine iline frm, chert 15% ± milky white, fossils.

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl...15...%)

- | | | | | |
|--|-----------|--------|-------------------------|------|
| 1. Sample weight | 20.12 gm. | 100.0% | 2. Wt. of F. P. | 2.26 |
| 3. Wt. after solution, with filter paper | 5.46 gm. | | | |
| 4. Less wt. F. P. (2) | 2.26 gm. | | | |
| 5. Wt. Insol. Residue (3 minus 4) | 3.20 gm. | 15.9% | | |
| 6. Wt. lost by solution (1 minus 5) | 16.92 gm. | 84.1% | | |
| 7. To balance (5 plus 6) | 20.12 gm. | 100.0% | | |

Well No. W— 011
 Depth 1615 1/2 to 1625
 No. samples used
 Analyst Pennel
 Date 5/15/35

B. Subsidiary:

- | | | |
|-------------------------------|-----|--------|
| 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		
1-1/2 mm		
1/2-1/4 mm		
1/4-1/8 mm		
1/8-1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform { 2.92± Sp. gr. Size-Grade(s) 1/4 Pan mm.

Analyst Filasota
 Date June 24 35

Wt. of sample 65 gm. 100.0% Shape Analysis:
 Heavy Minerals 13 gm. 7.9% A. %: a. %: C. %
 Light Minerals 1.52 gm. 92.1% r. %: R. %

Minerals Identified: Heavy Concentrate No. of Grains Rel. % Classification Grouping: Primary Minerals: 52.8% Absol. %

Barite	50	6.4
Pyrite	610	78.0
Limonite Agg.	120	15.4
Leucosphe	2	.2

Barite	0.5
Leucosphe	0.2
quartz	12.3
clay Minerals	39.0
Feldspars	0.5

Total 792 100%

Light Concentrate

quartz	97	13.3
chert	315	43.2
clay Minerals	310	42.4
* Feldspars	8	1.1

Secondary Minerals: 47.2%

Pyrite	6.2
Limonite Agg	1.2
chert	39.8

Total 730 100% Total 100%

Revised Lithologic Description (from descriptive log and laboratory data).
 ls. 85% Itary med to fine xline firm; chert 15% wht + Milky fossils. Pyrite Trace.

* Foldspars in form of spherulites with quartz Needles

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15%)

1. Sample weight 21.25 gm. 100.0%
 2. Wt. of F. P. 2.15
 3. Wt. after solution, with filter paper 9.20 gm.
 4. Less wt. F. P. (2) 2.15 gm.
 5. Wt. Insol. Residue (3 minus 4) 7.05 gm. 33.2%
 6. Wt. lost by solution (1 minus 5) 14.20 gm. 66.8%
 7. To balance (5 plus 6) 11.25 gm. 100.0%

Well No. W- 0117
 Depth 1625 to 1633
 No. samples used 2
 Analyst Penne
 Date 5/15/35

B. Subsidiary:

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

C. Screen Analysis 03

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	<u>4.94</u>	<u>70.1</u>
1/4-1/8 mm	<u>1.34</u>	<u>19.1</u>
1/8-1/16		<u>0.8</u>
Pan		
Total	<u>7.04</u>	<u>100.0</u>

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. }
 Bromoform } 2.933 Sp. gr. Size-Grade(s) 1 Pan mm.

Analyst Filaseta
 Date June 8-3

Wt. of sample gm. 100.0% Shape Analysis:
 Heavy Minerals gm. 3.12% A.%: a.%: C.%
 Light Minerals 00 gm. 96.1% r.%: R.%

Minerals Identified: No. of Grains Rel. % Classification Grouping: Absol. %
 Heavy Concentrate Primary Minerals: 39.8%

Bavite	<u>75</u>	<u>8.9</u>
Sphalerite	<u>2</u>	<u>.2</u>
Andalusite	<u>2</u>	<u>.2</u>
Pyrite	<u>638</u>	<u>75.7</u>
Limonite Agg.	<u>125</u>	<u>14.9</u>
Leucosane	<u>1</u>	<u>.1</u>
Total	<u>843</u>	<u>100%</u>

Barite	<u>0.3</u>
Andalusite	<u>0</u>
Leucosane	<u>0</u>
quartz	<u>17.8</u>
Feldspar	<u>0.1</u>
clay minerals	<u>21.6</u>

Light Concentrate	No. of Grains	Rel. %	Secondary Minerals: <u>60.2</u> %	Absol. %
quartz	<u>180</u>	<u>18.4</u>	Chert	<u>57.2</u>
feldspar	<u>1</u>	<u>0.1</u>	Pyrite	<u>2.5</u>
chert	<u>580</u>	<u>59.1</u>	Limonite Agg.	<u>0.5</u>
clay minerals	<u>220</u>	<u>22.4</u>	Sphalerite	<u>0</u>
Total	<u>981</u>	<u>100%</u>	Total	<u>100%</u>

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

LS 80% lt. gray med. x line firm; chert 20% wh. Milky;
Pyrite trace; fossils bryozoa, erinoid stems

- Green Mineral - Uniaxial \oplus Mod ng - np - Non Pleochroic

2023/04/10

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl...15...%)

- | | | | | |
|--|------------------|----------------|-------------------------|--|
| 1. Sample weight | <u>20.43</u> gm. | 100.0% | 2. Wt. of F. P. | |
| 3. Wt. after solution, with filter paper | <u>12.38</u> gm. | | | |
| 4. Less wt. F. P. (2) | <u>2.01</u> gm. | | | |
| 5. Wt. Insol. Residue (3 minus 4) | <u>10.37</u> gm. | <u>50.7</u> % | | |
| 6. Wt. lost by solution (1 minus 5) | <u>10.06</u> gm. | <u>49.3</u> % | | |
| 7. To balance (5 plus 6) | <u>20.43</u> gm. | <u>100.0</u> % | | |

B. Subsidiary:

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

Well No. W— 0117
 Depth 1633 to 1636 1/2
 No. samples used 1
 Analyst Penne
 Date 5/15/35

C. Screen Analysis 10.24

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm		<u>69.5</u>
1/4-1/8 mm	<u>2.06</u>	<u>20.1</u>
1/8-1/16	<u>.82</u>	
Pan	<u>.25</u>	
Total	<u>10.24</u>	<u>100.0</u>

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } 2.933 Sp. gr. Size-Grade(s) 1/4 Pan mm.

Analyst Filasata
 Date June 8-35

Wt. of sample 3.1 gm. 100.0% Shape Analysis:
 Heavy Minerals 1.23 gm. 1.3 % A.....%: a.....%: C.....%
 Light Minerals 3.1 gm. 98.7 % r.....%: R.....%

Minerals Identified;	No. of	Rel.	Classification Grouping:	Absol. %
Heavy Concentrate	Grains	%	Primary Minerals: <u>40.4</u> %	
* Pyrite	<u>1080</u>	<u>81.0</u>	Barite	
Leucosana	<u>2</u>	<u>0.2</u>	Leucosana	
Himonite Agg	<u>181</u>	<u>18.6</u>	Zircon	
Barite	<u>38</u>	<u>2.8</u>	quartz	<u>23.1</u>
Zircon	<u>1</u>	<u>0.1</u>	clay minerals	<u>17.3</u>
Sphalerite	<u>30</u>	<u>2.2</u>	Glaucanite	
Glaucanite	<u>1</u>			
Total	<u>1333</u>	<u>100%</u>	Secondary Minerals: <u>59.6</u> %	

Light Concentrate	No. of	Rel.	Classification Grouping:	Absol. %
quartz	<u>280</u>	<u>25.4</u>	chert	<u>58.3</u>
chert	<u>710</u>	<u>59.1</u>	Pyrite	<u>1.1</u>
clay minerals	<u>210</u>	<u>17.5</u>	Himonite Agg.	<u>0.2</u>
			Sphalerite	
Total	<u>1200</u>	<u>100%</u>		<u>100%</u>

Revised Lithologic Description (from descriptive log and laboratory data).
LS 75% lt gray, med x line firm; Chert 25% + wht + milky; Pyrite
Trace fossils bryozoa + crinoids;

A Gastropod or cephalopod fossil found now altered to
Pyrite.

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15%)

1. Sample weight 20.04 gm. 100.0%: F. P. _____

2. Wt. after solution, with filter paper 11.20 gm.

3. Less wt. F. P. (2) 2.46 gm.

4. Wt. Insol. Residue (3 minus 4) 8.74 gm. 43.6%

5. Wt. lost by solution (1 minus 5) 11.30 gm. 56.4%

6. To balance (5 plus 6) 20.04 gm. 100.0%

B. Subsidiary:

1. Original Wt. gm. 100.0%

2. Cylinder (+1/32) gm. %

3. Jar (1/32—1/64) gm. %

4. Drain gm. %

Well No. W- C117

Depth 16.36 1/2 to 16.45 1/2

No. samples used 2

Analyst Pennel

Date 5/15/35

C. Screen Analysis 8.62

SIZE GRAMS %

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	<u>98</u>	<u>35.0</u>
1/4-1/8 mm	<u>48</u>	<u>40.7</u>
1/8-1/16	<u>1.91</u>	<u>22.4</u>
Pan	<u>.16</u>	<u>1.9</u>
Total	<u>8.53</u>	<u>100.0</u>

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } 1.93± Sp. gr. Size-Grade(s) 1/8 Pan mm.

Analyst Filaseta

Date June 8-35

Wt. of sample 2 gm. 100.0%

Heavy Minerals 0.9 gm. 45%

Light Minerals 1.1 gm. 55%

Shape Analysis:

A. %: a. %: C. %

r %: R %

Minerals Identified:	No. of Grains	Rel. %
Heavy Concentrate		
<u>Sphalerite</u>	<u>20</u>	
<u>Barite</u>	<u>14</u>	
<u>Glaucanite</u>	<u>2</u>	<u>0.2</u>
<u>Pyrite</u>	<u>845</u>	<u>82.7</u>
<u>Himonite Agg</u>	<u>140</u>	
Total	<u>102</u>	<u>100%</u>

Classification Grouping:

Primary Minerals: 35.5% Absol. %

Light Concentrate	No. of Grains	Rel. %
<u>quartz</u>	<u>280</u>	<u>22.5</u>
<u>clay minerals</u>	<u>150</u>	<u>12.1</u>
<u>chert</u>	<u>800</u>	<u>64.2</u>
<u>Feldspars</u>	<u>3</u>	<u>.2</u>
<u>Spharulites</u>	<u>12</u>	<u>1.0</u>
Total	<u>1245</u>	<u>100%</u>

Secondary Minerals:	Absol. %
<u>Barite</u>	
<u>Glaucanite</u>	
<u>quartz</u>	<u>22.5</u>
<u>clay minerals</u>	<u>12.0</u>
<u>Feldspars</u>	<u>0.2</u>
<u>Spharulites</u>	<u>1.0</u>
Total	<u>35.5%</u>

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

LS. 75%± bf + lt gray, med x line in part granular, chert 25%±

Milky x wht; f.o.s' frs.

* Spherulites ... orthoclase + quartz in radial structure.

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl 1.5 %)

- | | | | | |
|--|------------------|---------|-------------------------|--|
| 1. Sample weight | <u>20.31</u> gm. | 100.0% | 2. Wt. of F. P. | |
| 3. Wt. after solution, with filter paper | <u>18.50</u> gm. | | | |
| 4. Less wt. F. P. (2) | <u>2.41</u> gm. | | | |
| 5. Wt. Insol. Residue (3 minus 4) | <u>.09</u> gm. | 79.3 % | | |
| 6. Wt. lost by solution (1 minus 5) | <u>4.22</u> gm. | 20.7 % | | |
| 7. To balance (5 plus 6) | <u>20.31</u> gm. | 100.0 % | | |

B. Subsidiation:

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

Well No. W— 0117

Depth 1645 1/2 to 1655 1/2

No. samples used 2

Analyst Pannel

Date 5/15/35

C. Screen Analysis 16.00

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	<u>12.87</u>	<u>80.0</u>
1/4-1/8 mm	<u>2.22</u>	<u>13.8</u>
1/8-1/16	<u>.74</u>	
Pan	<u>.25</u>	<u>1.6</u>
Total	<u>16.08</u>	<u>100.0</u>

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform { 2.937 Sp. gr. Size-Grade(s) 1/4 Pan mm.

Analyst Filaseta
Date June 10-35

Wt. of sample 3 gm. 100.0% Shape Analysis:

Heavy Minerals 2 gm. 16 % A. %: a %: C %
Light Minerals 3.17 gm. 99.4 % r %: R %

Minerals Identified:	No. of Grains	Rel. %	Classification Grouping:	Absol. %
Heavy Concentrate			Primary Minerals: <u>29.2</u> %	
<u>Barite</u>	<u>268</u>	<u>46.0</u>	<u>Barite</u>	<u>0.3</u>
<u>Sphalerite</u>	<u>22</u>	<u>3.8</u>	<u>Andalusite</u>	<u>0</u>
<u>Andalusite</u>	<u>3</u>	<u>0.5</u>	<u>quartz</u>	<u>10</u>
<u>Pyrite</u>	<u>210</u>	<u>46.3</u>	<u>clay minerals</u>	<u>7.8</u>
<u>limonite Agg.</u>	<u>20</u>	<u>3.4</u>	<u>spherulites</u>	
Total	<u>583</u>	<u>100%</u>	Secondary Minerals: %	
Light Concentrate			<u>Pyrite</u>	<u>0.3</u>
<u>quartz</u>	<u>241</u>	<u>17.1</u>	<u>limonite Agg.</u>	<u>0</u>
<u>Clay Minerals</u>	<u>140</u>	<u>9.9</u>	<u>chert</u>	<u>70.5</u>
<u>chert</u>	<u>1015</u>	<u>70.7</u>	<u>sphalerite</u>	<u>0</u>
<u>* spheralites</u>	<u>30</u>	<u>2.1</u>		
Total	<u>1416</u>	<u>100%</u>	Total	<u>100%</u>

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

LS 60% lt gray to buff, med x line, in part granular, chert 30%
milky & white; quartz 10% in euhedral xtals and xline masses

* Spherulites - fibers of quartz & orthoclase needles in radial combination. Found essentially in volcanic rocks. Also may be due to partial alteration of feldspar to quartz with the $K_2O + \frac{1}{2} Al_2O_3$ already gone.

DEEP WELL STUDY

MECHANICAL ANALYSIS

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

- | | | | |
|--|-----------|--------|----------------------|
| 1. Sample weight | 20.95 gm. | 100.0% | 2. Wt. of F. P. |
| 3. Wt. after solution, with filter paper | 18.95 gm. | | |
| 4. Less wt. F. P. (2) | 2.25 gm. | | |
| 5. Wt. Insol. Residue (3 minus 4) | 16.70 gm. | 79.7% | |
| 6. Wt. lost by solution (1 minus 5) | 4.25 gm. | | |
| 7. To balance (5 plus 6) | 20.95 gm. | 100.0% | |

Well No. W— 0117
 Depth 1655 1/2 to 1665 1/2
 No. samples used 2
 Analyst Pennel
 Date 5/15/35

B. Subsidiation:

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

C. Screen Analysis 16.67

SIZE	GRAMS	%
2 plus	1	
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	11.54	69.7
1/4-1/8 mm	3.29	19.9
1/8-1/16	1.38	
Pan	35	
Total	16.56	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. }
 Bromoform } 93± Sp. gr. Size-Grade(s) 14 Pan mm.

Analyst Filasetta
 Date June 10-35

Wt. of sample 8.12 gm. 100.0% Shape Analysis:
 Heavy Minerals 1.02 gm. .6 % A.....%: a.....%: C.....%
 Light Minerals 7.10 gm. 99.4 % r.....%: R.....%

Minerals Identified: No. of Grains Rel. % Classification Grouping: Absol. %
 Heavy Concentrate Primary Minerals: 26.7 %

Barite	233	39.4
<i>sphalerite</i>	6	1.0
Hornblende	1	0.2
limonite Agg.	34	5.8
Pyrite	315	53.4
leucosane	1	0.2
Total	590	100%

Barite 0.2
Hornblende 0
leucosane 0
quartz 4.9
spheralites 1.9
clay minerals 9.7

Light Concentrate		
quartz	205	19.0
chert	1005	73.7
clay minerals	132	9.7
spheralites	25	1.9
Total	1367	100%

Secondary Minerals: 73.3 %
Pyrite 0.3
limonite Agg. 0
chert 73.0
sphalerite 0
Total 100%

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

h.s. 60% bf to lt gry, med xlin. in Part granular; chert
30%± milky white + lt gry; quartz 10%± in Euhedral xtal s in
xline masses.

DEEP WELL STUDY

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 | 13.09 gm. | | | |
| 4. Less wt. F. P. (2) | 2.15 gm. | | | |
| 5. Wt. Insol. Residue (3 minus 4) | 10.94 gm. | 54.8% | | |
| 6. Wt. lost by solution (1 minus 5) | 9.22 gm. | 45.7% | | |
| 7. To balance (5 plus 6) | 20.16 gm. | 100.0% | | |

B. Subsidiary:

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

Well No. W— 0117

Depth 1669 1/2 to 1677 1/2

No. samples used 2

Analyst Pennel

Date 5/15/35

C. Screen Analysis 10.83

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	9.89	90.3
1/4-1/8 mm	.42	3.8
1/8-1/16	.65	5.9
Pan		
Total	10.96	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } 2.928 Sp. gr. Size-Grade(s) 1/40 Pan mm.

Analyst Filasota

Date June 10-35

Wt. of sample 2 gm. 100.0% Shape Analysis:

Heavy Minerals 0.2 gm. 6.6% A. %: a %: C %

Light Minerals 1.8 gm. 98.34% r %: R %

Minerals Identified; Heavy Concentrate No. of Grains Rel. % Classification Grouping: Primary Minerals: 31.9% Absol. %

Biotite	6	1.0
Barite	33	5.6
Sphalerite	30	5.0
Pyrite	423	71.4
Kimonite-Agg	101	17.0
Total	593	100%

Biotite	
Barite	
quartz	9.8
spherulites	2.0
Clay Minerals	25.0

Light Concentrate		
quartz	150	100
spherulites	30	20
Chert	940	62.6
Clay Minerals	380	25.4
Total	1500	100%

Secondary Minerals: 63.1%	
Pyrite	11.2
Kimonite-Agg	61.5
Chert	0.1
Sphalerite	
Total	100%

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

LS. 80%[±] lt gry + med gry, med x line granular porous
 chert 17%[±] milky wht, lt gry; Qtz 3%[±] in x line masses;
 Pyrite tr; fossils

DEEP WELL STUDY

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 | 18.65 gm. | | | |
| 4. Less wt. F. P. (2) | 2.11 gm. | | | |
| 5. Wt. Insol. Residue (3 minus 4) | 16.54 gm. | 82.2% | | |
| 6. Wt. lost by solution (1 minus 5) | 3.57 gm. | 17.8% | | |
| 7. To balance (5 plus 6) | 20.11 gm. | 100.0% | | |

B. Subsidiary:

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

Well No. W— 0117
 Depth 16.74% to 16.79%
 No. samples used 1
 Analyst Pennel
 Date 5/15/35

C. Screen Analysis 16.32

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	14.08	87.1
1/4-1/8 mm	1.47	9.1
1/8-1/16	.30	1.9
Pan	.21	1.3
Total	16.06	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. }
 Bromoform } 2.92± Sp. gr. Size-Grade(s) 1/4 Pan mm.

Analyst Filasota
 Date June 10-35

Wt. of sample 2.94 gm. 100.0% Shape Analysis:

Heavy Minerals gm. 0.5% A%: a%: C%
 Light Minerals gm. 2.13 99.5% r%: R%

Minerals Identified: No. of Grains Rel. % Classification Grouping: Absol. %
 Heavy Concentrate Primary Minerals: 24.2%

Minerals Identified:	No. of Grains	Rel. %
Barite	24	2.9
sphalerite	49	6.0
Biotite	9	1.1
Pyrite	661	80.4
limonite Agg	14	9.0
leucoclene	5	0.6
Total	822	100%
Light Concentrate		
Chert	780	75.7
glauconite	1	0.1
clay minerals	150	14.5
spherulites	30	2.9
quartz	70	6.8
Total	1031	100%

Classification Grouping:	Absol. %
Primary Minerals: 24.2%	
Secondary Minerals: 75.8%	
Barite	
Biotite	
leucoclene	
clay minerals	14.4
spherulites	2.9
quartz	6.8
glauconite	0.1
Chert	75.4
Pyrite	0.4
limonite Agg	
sphalerite	
Total	100%

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

chert 65.7%± wht + lt gry + milky, ls 35%± lt med gry, med. fine, granular. Porous fossils: Dryozoa + Crinoid stems

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl $\frac{1}{5}$ %)

1. Sample weight 20.48 gm. 100.0%: 2. Wt. of F. P. _____
3. Wt. after solution, with filter paper 14.92 gm.
4. Less wt. F. P. (2) 2.27 gm.
5. Wt. Insol. Residue (3 minus 4) 12.65 gm. 61.8 %
6. Wt. lost by solution (1 minus 5) 7.83 gm. 38.2 %
7. To balance (5 plus 6) 20.48 gm. 100.0 %

B. Subsidiation:

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

Well No. W- 0117

Depth 16.79 1/2 to 16.89 1/2

No. samples used 2

Analyst Pennel

Date 5/15/35

C. Screen Analysis 12.53

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	<u>10.94</u>	<u>88.0</u>
1/4-1/8 mm	<u>1.06</u>	<u>8.5</u>
1/8-1/16	<u>.43</u>	<u>3.5</u>
Pan		
Total	<u>12.43</u>	<u>100.0</u>

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. } 93+ Sp. gr. Size-Grade(s) 1/4 Pan mm.
 Bromoform }

Analyst Filasetta

Date June 10-35

Wt. of sample .56 gm. 100.0% Shape Analysis:

Heavy Minerals 0.6 % A. _____ %: a. _____ %: C. _____ %

Light Minerals 1.55 gm. 99.4 % r. _____ %: R. _____ %

Minerals Identified: No. of Grains Rel. % Classification Grouping: Absol. %
 Heavy Concentrate _____ % Primary Minerals: 26.8 %

<u>sphalerite</u>	<u>15</u>	<u>3.1</u>
<u>Barite</u>	<u>3</u>	<u>0.6</u>
<u>Pyrite</u>	<u>395</u>	<u>82.5</u>
<u>Leucosene</u>	<u>1</u>	<u>0.2</u>
<u>limonite Agg</u>	<u>65</u>	<u>11.6</u>
Total	<u>479</u>	<u>100%</u>

<u>Barite</u>	<u>0</u>
<u>Leucosene</u>	<u>0</u>
<u>Quartz</u>	<u>8.7</u>
<u>Clay Minerals</u>	<u>15.6</u>
<u>Spherulites</u>	<u>2.0</u>
<u>Feldspars</u>	<u>0.4</u>
<u>Glauconite</u>	<u>0.1</u>

Light Concentrate	No. of Grains	Rel. %
<u>quartz</u>	<u>120</u>	<u>8.7</u>
<u>chert</u>	<u>1006</u>	<u>73.1</u>
<u>clay minerals</u>	<u>216</u>	<u>15.7</u>
<u>spherulites</u>	<u>28</u>	<u>2.0</u>
<u>feldspars</u>	<u>5</u>	<u>0.4</u>
<u>glauconite</u>	<u>1</u>	<u>0.1</u>
Total	<u>1376</u>	<u>100%</u>

Secondary Minerals: 73.2 %

<u>Pyrite</u>	<u>0.5</u>
<u>limonite Agg</u>	<u>0</u>
<u>chert</u>	<u>72.7</u>
<u>sphalerite</u>	<u>100%</u>

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

Chert 60%± wht lt gray + milky; LS 35% lt gray + med. x line;
granular Poros; Quartz 3-5% in Euhedral xtals + x line masses;
Fossil's, crinoid stems + Brp zoa.

DEEP WELL STUDY

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	13.23 gm.			
4. Less wt. F. P. (2)	2.04 gm.			
5. Wt. Insol. Residue (3 minus 4)	11.19 gm.	55.3%		
6. Wt. lost by solution (1 minus 5)	9.04 gm.	44.7%		
7. To balance (5 plus 6)	20.23 gm.	100.0%		

B. Subsidiary:

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

Well No. W- 0117
 Depth 1689 1/2 to 1693 1/2
 No. samples used 1
 Analyst Pennel
 Date 5/15/35

C. Screen Analysis 11.14

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	<u>7.30</u>	<u>66.5</u>
1/4-1/8 mm	<u>2.11</u>	<u>19.2</u>
1/8-1/16	<u>1.10</u>	<u>10.0</u>
Pan	<u>.47</u>	<u>4.3</u>
Total	<u>11.98</u>	<u>100.0</u>

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } 2.934 Sp. gr. Size-Grade(s) 1/4 Pan mm.

Analyst Filasetta
 Date June 35

Wt. of sample 3.66 gm. 100.0% Shape Analysis:

Heavy Minerals .05 gm. 1.4 % A. %: a. %: C. %
 Light Minerals 3.61 gm. 98.6 % r. %: R. %

Minerals Identified; Heavy Concentrate No. of Grains Rel. % Classification Grouping: Primary Minerals: 24.5 % Absol. %

Barite	11	2.5
Sphalerite	6	1.4
Amphibole	1	0.2
Pyrite	339	76.7
limonite Agg	85	19.2

Barite	
Amphibole	
quartz	8.6
clay minerals	14.1
spherulites	1.5
Feldspars	0.3

Total	442	100%
Light Concentrate		
quartz	104	8.7
clay minerals	171	14.3
chert	900	79.2
spherulites	18	1.5
Feldspars	04	0.3

Secondary Minerals: <u>75.5</u> %	
chert	74.1
Pyrite	1.1
limonite Agg.	0.3
Sphalerite	
Total	100%

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

LS (46) 20 bf + lt gray med xline granular Porous; Chert 40 25-70 ±
wh. milky + lt gray; quartz 57% Euhedral xtals + xline masses;
fossils, Crinoid stems + bryozoa 5h-8%
or clay const.

DEEP WELL STUDY

MECHANICAL ANALYSIS

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

1. Sample weight	20.32 gm.	100.0%	2. Wt. of F. P.	
3. Wt. after solution, with filter paper	7.03 gm.			
4. Less wt. F. P. (2)	2.30 gm.			
5. Wt. Insol. Residue (3 minus 4)	4.73 gm.	23.3%		
6. Wt. lost by solution (1 minus 5)	15.59 gm.	76.7%		
7. To balance (5 plus 6)	20.32 gm.	100.0%		

Well No. W- 0117
 Depth 16.932 to 16.982
 No. samples used 1
 Analyst Pennel
 Date 5/15/35

B. Subsidiation:

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

C. Screen Analysis 4.64

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	2.39	50.9
1/4-1/8 mm	1.33	28.3
1/8-1/16	.97	20.8
Pan		
Total	4.69	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } 2.92± Sp. gr. Size-Grade(s) 1/4-Pan mm.

Analyst Filasata
 Date June 11-35

Wt. of sample 2.13 gm. 100.0% Shape Analysis:

Heavy Minerals 14 gm. 6.6% A.....%: a.....%: C.....%

Light Minerals 1.99 gm. 93.4% r.....%: R.....%

Minerals Identified: Heavy Concentrate No. of Grains Rel. % Classification Grouping: Primary Minerals: 30.8% Absol. %

Minerals Identified:	No. of Grains	Rel. %	Classification Grouping:	Absol. %
Barite	2	0.3	Barite	
Biotite	1	0.1	Biotite	
Sphalerite	3	0.4		
Pyrite	640	94.2	Pyrite	
Leucopane	1	0.1	Leucopane	
Limonite Agg	33	4.9	Hornblende	
Hornblende	1		quartz	10.5
Total	681	100%	Feldspar	0.6
Light Concentrate			Spherulites	8.8
quartz	160	11.2	Sph. Minerals	16.4
Chert	960	67.2	Secondary Minerals:	62.2%
Feldspar	50	0.6	Pyrite	6.2
Spherulites	30	3.2	Limonite Agg.	0.8
Clay Minerals	250	17.5	Chert	62.7
			Sphalerite	

Total 1428 100% Total 100%

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

L.S. 70%± bf+lt gry; med+fine granular porous chert
 20%± wh. milky + lt gry; glauconite tr; fossils, crinoid stems, Bryozoa.

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15%)

1. Sample weight 20.24 gm. 100.0%: F. P. 2.21
2. Wt. after solution, with filter paper 4.58 gm.
3. Less wt. F. P. (2) 2.21 gm.
4. Wt. Insol. Residue (3 minus 4) 2.34 gm. 11.7%
5. Wt. lost by solution (1 minus 5) 17.87 gm. 88.3%
6. To balance (5 plus 6) 20.24 gm. 100.00%

B. Subsidiation:

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

Well No. W— 0117
 Depth 1698 1/2 to 1701 1/2
 No. samples used 1
 Analyst Pennel
 Date 5/17/35

C. Screen Analysis 2.32

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm		
1/4-1/8 mm		
1/8-1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } 2.934 Sp. gr. Size-Grade(s) 1/4 Pan mm.

Analyst Filasetta
 Date June - 35

- Wt. of sample 2.934 gm. 100.0%
 Heavy Minerals 11 gm. 7.5%
 Light Minerals 1.36 gm. 2.5%

Shape Analysis:

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

Minerals Identified:
 Heavy Concentrate

No. of Grains	Rel. %
<u>4</u>	<u>0.7</u>
<u>7</u>	<u>1.3</u>
<u>460</u>	<u>85.9</u>
<u>66</u>	<u>12.1</u>
Total <u>536</u> 100%	

Classification Grouping:

Primary Minerals: 44.7% Absol. %

<u>Barite</u>	9.7
<u>quartz</u>	32.4
<u>clay minerals</u>	0.7
<u>Feldspar</u>	1.9
<u>Spherulites</u>	

Light Concentrate

<u>150</u>	<u>10.5</u>
<u>500</u>	<u>34.9</u>
<u>740</u>	<u>51.8</u>
<u>10</u>	<u>0.7</u>
<u>30</u>	<u>2.1</u>
Total <u>1430</u> 100%	

Secondary Minerals: 55.3%

<u>chert</u>	47.9
<u>Pyrite</u>	6.4
<u>Himonite Agg.</u>	0.9
<u>Sphaerulites</u>	0.1
Total <u>100%</u>	

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

L.S. 85% bf to med brown, med x line firm; chert 15%
wh milky alt. qtz; glauconite tr; fossils, Crinoid stems
bryozoa.

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15%)

- | | | | |
|--|------------------|---------------|-------------------------|
| 1. Sample weight | <u>21.37</u> gm. | 100.0% | 2. Wt. of F. P. |
| 3. Wt. after solution, with filter paper | <u>5.55</u> gm. | | |
| 4. Less wt. F. P. (2) | <u>2.65</u> gm. | | |
| 5. Wt. Insol. Residue (3 minus 4) | <u>2.90</u> gm. | <u>13.6</u> % | |
| 6. Wt. lost by solution (1 minus 5) | <u>11.47</u> gm. | <u>86.4</u> % | |
| 7. To balance (5 plus 6) | <u>21.31</u> gm. | <u>100</u> % | |

B. Subsidiary:

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

Well No. W— 0117
 Depth 17015 to 1705
 No. samples used
 Analyst Penmel
 Date 6/21/35

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm		
1/4-1/8 mm		
1/8-1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } Sp. gr. Size-Grade(s) 1/4 Pan mm.

Analyst Filayata
 Date Jul 2-35

Wt. of sample 204 gm. 100.0% Shape Analysis:

Heavy Minerals27 gm. 13.2% A.%: a.%: C.%

Light Minerals77 gm. 86.8% r%: R%

Minerals Identified: Heavy Concentrate No. of Grains Rel. % Classification Grouping: Primary Minerals: 48.4% Absol. %

Pyrite	90	90
Limonite Agg	10	70

quartz	6.9
clays	40.5
Feldspars	.7
Glaucanite	1.3

Total 100%

Light Concentrate	No. of Grains	Rel. %
quartz	150	7.8
chert	850	44.3
clay	900	46.8
Feldspars	16	.8
Glaucanite	15	.8
Total	1921	100%

Secondary Minerals: <u>51.6</u> %	Absol. %
Pyrite	11.9
Limonite Agg	1.3
Chert	38.4
Total	100%

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

L5 85%± bf to lg Brown, med to fine xline firm;
Chert 15%± wh bf to lg gray, glaucanite + r, flfs,
Crinoid stems.

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15%)

- | | | | |
|--|----------------------------|--------|-------------------------|
| 1. Sample weight | <u>20.49</u> gm. | 100.0% | 2. Wt. of F. P. |
| 3. Wt. after solution, with filter paper | <u>5.17</u> gm. | | |
| 4. Less wt. F. P. (2) | <u>2.29</u> gm. | | |
| 5. Wt. Insol. Residue (3 minus 4) | <u>2.88</u> gm. | 14.1% | |
| 6. Wt. lost by solution (1 minus 5) | <u>17.61</u> gm. | 85.9% | |
| 7. To balance (5 plus 6) | <u>20.49</u> gm. | 100% | |

B. Subsidiation:

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

Well No. W- 0117

Depth 1705 to 1711 1/2

No. samples used 2

Analyst Penning

Date 6/21/35

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm		
1/4-1/8 mm		
1/8-1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } Sp. gr. _____ Size-Grade(s) 1/4 Pan mm.

Analyst F. J. C. Ota

Date July 1, 1935

Wt. of sample 1.84 gm. 100.0% Shape Analysis:

Heavy Minerals 0.25 gm. 13.6% A. %: a. %: C. %

Light Minerals 1.59 gm. 86.4% r. %: R. %

Minerals Identified:	No. of Grains	Rel. %	Classification Grouping:	Absol. %
Heavy Concentrate			Primary Minerals: <u>60.5</u> %	
Sphalerite	1	.1	quartz	10.3
Barite	15	2.3	clays	44.1
Pyrite	580	79.5	Feldspar	1.6
Limonite Agg.	130	17.7	glaucanite	.9
Leucocene	3	.4	spherulite	3.5
Total	729	100%	Leucocene	.1
Light Concentrate			Secondary Minerals: <u>39.5</u> %	
quartz	120	12.6	sphalerite	.0
chert	300	30.1	Barite	.3
clay	510	51.1	Pyrite	10.8
Feldspar	18	1.8	Limonite Agg	2.4
glaucanite	10	1.0	Chert	26.0
spherulites	40	4.0		
Total	998	100%	Total	100%

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

1.5, 95%± bf to lgt brown, med to fine x lmp.
firm; chert 5%, wh + lt gray; glaucanite tr;
pyrite tr; fos' fr's crinoid stems, bryozoa, cuboidal
quartz

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl 7.5%)

- | | | | | |
|--|------------------|-------------|-------------------------|--|
| 1. Sample weight | <u>21.05</u> gm. | 100.0% | 2. Wt. of F. P. | |
| 3. Wt. after solution, with filter paper | <u>5.54</u> gm. | | | |
| 4. Less wt. F. P. (2) | <u>25</u> gm. | | | |
| 5. Wt. Insol. Residue (3 minus 4) | <u>29</u> gm. | <u>16</u> % | | |
| 6. Wt. lost by solution (1 minus 5) | <u>17.76</u> gm. | | | |
| 7. To balance (5 plus 6) | <u>21.05</u> gm. | | | |

B. Subsidiation:

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

Well No. W-- 0117
 Depth 1711 1/2 to 1717 1/2
 No. samples used
 Analyst Penne!
 Date 6/21/35

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm		
1/4-1/8 mm		
1/8-1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. }
 Bromoform } Sp. gr. Size-Grade(s) 1/4 Pan mm.

Analyst Filasetta
 Date July 2-35

- | | | | | |
|--------------------------|-----------------|---------------|--|--|
| Wt. of sample | <u>1.83</u> gm. | 100.0% | | |
| Heavy Minerals | <u>26</u> gm. | <u>14.2</u> % | | |
| Light Minerals | <u>1.57</u> gm. | <u>85.8</u> % | | |

Shape Analysis:

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

Minerals Identified;
 Heavy Concentrate

No. of Grains Rel. %

Classification Grouping:

Absol. %

Barite	5	.7	
Pyrite	540	70.5	
Limonite	220	28.8	

Primary Minerals: 45.9 %

quartz 10.5
 clays 35.0
 Feldspars .4

Total 765 100%

Light Concentrate

quartz	150	12.2	
chert	570	46.5	
Clays	500	40.8	
Feldspars	6	.5	

Secondary Minerals: 54.1 %

pyrite 10.0
 Barite .1
 Limonite 4.1
 chert 39.9
100%

Total 1226 100% Total
 Revised Lithologic Description (from descriptive log and laboratory data).

LS 90± bft to dk brown, med x lin, granular
porous; chert 870± wh + tlt gray to dk brown, pyrite
tr, flts, crinoid stems, bryozoa, ostracods
brachs,

DEEP WELL STUDY

limestone

MECHANICAL ANALYSIS

A. Acid treatment (HCl *15*%)

- | | | | | |
|--|------------------|---------------|-------------------------|--|
| 1. Sample weight | <i>20.05</i> gm. | 100.0% | 2. Wt. of F. P. | |
| 3. Wt. after solution, with filter paper | <i>1.99</i> gm. | | | |
| 4. Less wt. F. P. (2) | <i>1.61</i> gm. | | | |
| 5. Wt. Insol. Residue (3 minus 4) | <i>1.38</i> gm. | <i>31.8</i> % | | |
| 6. Wt. lost by solution (1 minus 5) | <i>13.67</i> gm. | <i>68</i> % | | |
| 7. To balance (5 plus 6) | <i>20.05</i> gm. | <i>100</i> % | | |

Well No. W- *0117*
 Depth *1717 1/2* to *1720*
 No. samples used
 Analyst *Pennel*
 Date *6/21/35*

B. Subsidiation:

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

C. Screen Analysis *6.26*

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	<i>4.52</i>	<i>13.4</i>
1/4-1/8 mm	<i>.49</i>	<i>8.0</i>
1/8-1/16	<i>.47</i>	<i>7.6</i>
Pan	<i>.68</i>	<i>11.0</i>
Total	<i>6.16</i>	100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } Sp. gr. Size-Grade(s) *14-1/16* mm.

Analyst *Filasetta*
 Date *July 3rd-35*

Wt. of sample *1.01* gm. 100.0% Shape Analysis:

Heavy Minerals *33* gm. *32.1* % A. %: a. %: C. %
 Light Minerals *68* gm. *67.9* % r %: R %.

Minerals Identified: Heavy Concentrate No. of Grains Rel. % Classification Grouping: Primary Minerals: *52.1* % Absol. %

Barite	17	24	
Pyrite	660	94.0	
limonite Agg	25	3.6	

quartz	3.8	
clays	47.6	
Feldspars	0.2	
Spherulites	0.5	

Total *702* 100%

Light Concentrate		
quartz	40	5.9
chart	180	22.6
clays	500	70.6
Feldspars	2	0.3
Spherulites	6	0.8

Secondary Minerals: *77.9* %

Barite	0.8	
Pyrite	30.7	
limonite Agg	1.2	
Chart	16.2	

Total *708* 100% Total 100%

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

LS 50%± med to dk gry, med x line, very fossiliferous granular porous; shale 50%± med gry Calc; 10-15% sol, soft friable, Pyrite tr.

DEEP WELL STUDY

shale

MECHANICAL ANALYSIS

A. Acid treatment (HCl *15*%)

- | | | | | |
|--|------------------|---------------|-----------------|--|
| 1. Sample weight | <i>20.75</i> gm. | 100.0% | 2. Wt. of F. P. | |
| 3. Wt. after solution, with filter paper | <i>19.91</i> gm. | | | |
| 4. Less wt. F. P. (2) | <i>2.65</i> gm. | | | |
| 5. Wt. Insol. Residue (3 minus 4) | <i>17.26</i> gm. | | | |
| 6. Wt. lost by solution (1 minus 5) | <i>49</i> gm. | <i>16.8</i> % | | |
| 7. To balance (5 plus 6) | <i>20.75</i> gm. | | | |

Well No. W— *0117*
 Depth *1720* to *172 1/2*
 No. samples used *1*
 Analyst *Penne*
 Date *6/21/35*

B. Subsidiation:

- | | | |
|---------------------|------------------|---------------|
| 1. Original Wt. | <i>17.26</i> gm. | 100.0% |
| 2. Cylinder (+1/32) | <i>4.52</i> gm. | <i>26.2</i> % |
| 3. Jar (1/32—1/64) | <i>2.83</i> gm. | <i>16.4</i> % |
| 4. Drain | <i>9.91</i> gm. | <i>57.4</i> % |

C. Screen Analysis *4.52*

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	<i>.05</i>	<i>1</i>
1/4-1/8 mm	<i>.26</i>	<i>5.8</i>
1/8-1/16	<i>.86</i>	<i>19.1</i>
Pan	<i>3.34</i>	<i>74.0</i>
Total	<i>4.51</i>	<i>100.0</i>

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

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

Analyst *F. J. J. J.*
 Date *July 8-35*

Wt. of sample *84* gm. 100.0%

Shape Analysis:

Heavy Minerals *10* gm. *11.9* %

A. %: a. %: C. %

Light Minerals *74* gm. *88.1* %

r. %: R. %

Minerals Identified:
 Heavy Concentrate

No. of Grains

Rel. %

Classification Grouping:
 Primary Minerals: *88.1* %

Absol. %

*Pyrite
 Barite
 Hornblende*

<i>300</i>	<i>96.0</i>
<i>15</i>	<i>4.7</i>
<i>1</i>	<i>0.3</i>

*Hornblende
 Clay Minerals
 Quartz* *87.5
 0.6*

Total *310* 100%

Light Concentrate

*clay minerals
 quartz*

<i>1500</i>	<i>99.3</i>
<i>10</i>	<i>0.7</i>

Secondary Minerals: *11.9* %

*Pyrite
 Barite* *11.3
 0.6*

Total *1510* 100% Total

100%

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

*shale 95-100% med gray, calc 17% sol, soft friable,
 pyrite*

DEEP WELL STUDY

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 6.62 gm.
4. Less wt. F. P. (2) 2.62 gm.
5. Wt. Insol. Residue (3 minus 4) _____ gm. _____%
6. Wt. lost by solution (1 minus 5) _____ gm. 80.8 %
7. To balance (5 plus 6) . . . 20.2 gm. _____%

B. Subsidiary:

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

Well No. W— 0117

Depth 172 1/2 to 173 1/2

No. samples used 4

Analyst Pennel

Date 6/21/35

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm		
1/4-1/8 mm		
1/8-1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } Sp. gr. Size-Grade(s) 1/4-1/16 mm.

Analyst F. Lavata

Date July 25

Wt. of sample 15.3 gm. 100.0% Shape Analysis:

Heavy Minerals 26 gm. _____% A. _____%: a. _____%: C. _____%

Light Minerals 2 gm. 83.0% r. _____%: R. _____%

Minerals Identified: Heavy Concentrate No. of Grains Rel. % Classification Grouping: Primary Minerals: 49.5% Absol. %

Sphalerite	2	0.1	quartz	2.8
Barite	14	1.0	clays	46.5
Pyrite	1400	97.2	Foldings	0.2
Limonite Agg	25	1.7		

Total 144 100%

Light Concentrate

quartz	30	3.4
chert	360	40.3
clays	500	56.0
Foldings	3	

Secondary Minerals: 50.5%

sphalerite		
Barite		0.2
Pyrite		46.5
Limonite Agg		0.3
chert		38.5

Total 893 100% Total

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

L.S. 95% ± lt gray to dk brown, med xline gran.

Porous Chert 3% wh + lt gray, shale 2% lt to

med gray, silty; fus/tri crinoid stems, pyrites,

Brach frag, Pyrite 1%, 80% Sol,

DEEP WELL STUDY

MECHANICAL ANALYSIS

- A. Acid treatment (HCl... 75%)
1. Sample weight 20.70 gm. 100.0%: F. P. _____
 2. Wt. of _____
 3. Wt. after solution, with filter paper 13.30 gm.
 4. Less wt. F. P. (2) 2.55 gm.
 5. Wt. Insol. Residue (3 minus 4) 10.75 gm. 51.9 %
 6. Wt. lost by solution (1 minus 5) 9.95 gm. 48.1 %
 7. To balance (5 plus 6) 20.70 gm. 100 %

Well No. W- 0117
 Depth 1731 to 1737 1/2
 No. samples used 2
 Analyst Penner
 Date 6/21/35

- B. Subsidiary:
1. Original Wt. gm. 100.0%
 2. Cylinder (+1/32) gm. %
 3. Jar (1/32-1/64) gm. %
 4. Drain gm. %

C. Screen Analysis 10.62

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	<u>9.33</u>	<u>87.8</u>
1/4-1/8 mm	<u>.82</u>	<u>7.7</u>
1/8-1/16	<u>.22</u>	<u>2.1</u>
Pan	<u>.25</u>	<u>2.4</u>
Total	<u>10.62</u>	<u>100.0</u>

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. }
 Bromoform } Sp. gr. _____ Size-Grade(s) 1/4-1/16 mm.

Analyst Filajeta
 Date July 2-35

Wt. of sample 98 gm. 100.0% Shape Analysis:
 Heavy Minerals05 gm. 5.1 % A. %: a %: C %
 Light Minerals 93 gm. 94.9 % r %: R %

Minerals Identified; No. of Rel. Classification Grouping; Absol. %
 Heavy Concentrate Grains % Primary Minerals: 28.3 %

Barite	20	3.1
Pyrite	600	94.5
Limonite	15	2.4

quartz 3.7
 clays 23.9
 spherulites 0.7

Total 63 100%

Light Concentrate	No. of Grains	Rel. %
quartz	5	3.9
chert	1000	70.2
clays	360	25.2
spherulites	10	0.7

Secondary Minerals: 71.7 %
 Barite 0.2
 Pyrite 4.8
 Limonite 0.1
 chert 66.6
 Total 100%

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

Chert 60%± wh. to gray, LS 40%± lgt. to dk brown, med fine granular porous; pyrite trace, fossiliferous crinoid stems, brachiopods, brach. frag.

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15%)

- | | | | | |
|--|-----------|--------|-----------------|--|
| 1. Sample weight | 21.42 gm. | 100.0% | 2. Wt. of F. P. | |
| 3. Wt. after solution, with filter paper | 4.39 gm. | | | |
| 4. Less wt. F. P. (2) | 2.64 gm. | | | |
| 5. Wt. Insol. Residue (3 minus 4) | 1.75 gm. | 8.2% | | |
| 6. Wt. lost by solution (1 minus 5) | 19.67 gm. | | | |
| 7. To balance (5 plus 6) | 21.42 gm. | 100% | | |

B. Subsidiation:

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

Well No. W- 0117
 Depth 1737 1/2 to 1747 1/2
 No. samples used 2
 Analyst Pennel
 Date 6/21/35

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm		
1/4-1/8 mm		
1/8-1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

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

Analyst Filasetta
 Date July 2-35

Wt. of sample .61 gm. 100.0% Shape Analysis:

Heavy Minerals .35 gm. 57.5% A. %: a. %: C. %

Light Minerals .26 gm. 42.5% r. %: R. %

Minerals Identified: Heavy Concentrate No. of Grains Rel. % Classification Grouping: Primary Minerals: 0.9% Absol. %

Barite	16	1.3
Pyrite	630	52.9
limonite Agg.	545	45.8

quartz	10.1
clays	9.8
Feldspars	0.5
spherrulites	0.5

Total 119 100%

Light Concentrate

quartz	380	83.6
chert	820	51.4
clays	370	23.0
Feldspars	20	1.2
spherrulites	17	1.1

Secondary Minerals: 79.1%

Barite	0.77
pyrite	30.3
limonite Agg	26.3
Chert	21.8
Total	218 100%

Total 1607 100% Total

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

L.S. 95%± composed of oolites 60% and clastic fragments 40%, Chert 5%, wht feldspars, clear quartz frags, Pyrite tr; feldspars, limonite Agg, brachfrags, br 10209.

DEEP WELL STUDY

MECHANICAL ANALYSIS

- A. Acid treatment (HCl 15%)
1. Sample weight 20.24 gm. 100.0%: F. P. _____
 2. Wt. of _____
 3. Wt. after solution, with filter paper _____ gm.
 4. Less wt. F. P. (2) 2.29 gm.
 5. Wt. Insol. Residue (3 minus 4) 3.85 gm. 19.0 %
 6. Wt. lost by solution (1 minus 5) 16.39 gm. 81.0 %
 7. To balance (5 plus 6) 20.24 gm. _____ %

Well No. W— 0117
 Depth 1747 1/2 to 1750
 No. samples used 1
 Analyst Penne
 Date 6/21/35

- B. Subsidiation:
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		
1-1/2 mm		
1/2-1/4 mm		
1/4-1/8 mm		
1/8-1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

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

Analyst Filasetta
 Date July 2-35

- Wt. of sample 1.40 gm. 100.0% Shape Analysis:
- Heavy Minerals 34 gm. 24.3 % A. _____ %: a. _____ %: C. _____ %
- Light Minerals 1.06 gm. 75.7 % r. _____ %: R. _____ %

Minerals Identified: No. of Grains Rel. % Classification Grouping: Absol. %

Minerals Identified:	No. of Grains	Rel. %	Classification Grouping:	Absol. %
Barite	4	0.1	quartz	84.8
Anhydrite	1	0.1	clays	41.6
Pyrite	126	17.8	Feldspars	- 0.8
Limonite Agg	580	81.8	Spheralites	0.8

Total 711 100%

Light Concentrate

quartz	600	82.8
clay	200	10.9
clays	1000	59.8
Feldspars	20	1.1
Spheralites	7	0.4

Total 1827 100%

Secondary Minerals: 32.5 %

clay	8.3
Barite	0.1
Anhydrite	4.3
Pyrite	-
Limonite Agg	19.8
Total	100%

Total 100%

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

LS 95±bf, in part medx, in granular, porous;
in part oolitic; in part elastic; 51s 37. dk brown;
non calc; ferruginous, glauconitic tr fossiliferous;
Grysh Cove 390±

DEEP WELL STUDY

limestone

MECHANICAL ANALYSIS

A. Acid treatment (HCl 15%)

1. Sample weight	20.00 gm.	100.0%	2. Wt. of F. P.	
3. Wt. after solution, with filter paper	8.85 gm.			
4. Less wt. F. P. (2)	11.15 gm.			
5. Wt. Insol. Residue (3 minus 4)	6.29 gm.	31.5%		
6. Wt. lost by solution (1 minus 5)	13.71 gm.	68.5%		
7. To balance (5 plus 6)	20.00 gm.	100%		

Well No. W- 0117
 Depth 1750 to 1753
 No. samples used 1
 Analyst Pennel
 Date 6/21/35

C. Screen Analysis 6.13

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm	3.07	
1/4-1/8 mm	.98	
1/8-1/16	.94	
Pan	1.11	
Total	6.10	100.0

B. Subsidiary:

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

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

Acet. Tetrabr. Bromoform } Sp. gr. Size-Grade(s) 1/4-1/16 mm.

Analyst Filaspata
 Date July 2-35

Wt. of sample 1.88 gm. 100.0% Shape Analysis:

Heavy Minerals .87 gm. 46.3% A.....%: a.....%: C.....%

Light Minerals 1.01 gm. 53.7% r.....%: R.....%

Minerals Identified: Heavy Concentrate No. of Grains Rel. % Classification Grouping: Primary Minerals: 30.0% Absol. %

Barite	7	0.9
Pyrite	80	10.7
Hematite Agg	600	37.7
Neocoxene	5	0.7

quartz	0.3
clays	4.4
Feldspars	24.9
sphero-lites	1.0
	-0.3

Total 742 100%

Light Concentrate

quartz	110	8.2
chart	600	44.8
clays	600	44.7
Feldspars	24	1.8
sphero-lites	7	0.5

Secondary Minerals: 70.0%

Barite	0.7
Pyrite	5.0
Hematite Agg	40.5
chart	24.9
	100%

Total 1341 100%

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

LS soft in part, med fine, granular, porous, in part oolitic, sol - 50%; hematite 1-2%; shale 50% med gr, Calc - 10-20% sol, soft, friable ferruginous.

DEEP WELL STUDY

MECHANICAL ANALYSIS

A. Acid treatment (HCl. 15%)

- | | | | | |
|--|-----------|--------|-----------------|--|
| 1. Sample weight | 20.06 gm. | 100.0% | 2. Wt. of F. P. | |
| 3. Wt. after solution, with filter paper | 16.20 gm. | | | |
| 4. Less wt. F. P. (2) | 2.27 gm. | | | |
| 5. Wt. Insol. Residue (3 minus 4) | 13.93 gm. | 69.4% | | |
| 6. Wt. lost by solution (1 minus 5) | 6.13 gm. | 30.6% | | |
| 7. To balance (5 plus 6) | 20.06 gm. | 100% | | |

B. Subsidiation:

- | | | |
|---------------------|-----------|--------|
| 1. Original Wt. | 13.93 gm. | 100.0% |
| 2. Cylinder (+1/32) | 2.12 gm. | 13.2% |
| | 3.15 gm. | |
| 3. Jar (1/32-1/64) | 0.00 gm. | 7.2% |
| | 2.15 gm. | |
| 4. Drain | 11.09 gm. | 79.6% |

Well No. W- 2117
 Depth 1753 to 1752 1/4
 No. samples used 3
 Analyst Pannel
 Date 6/21/35

C. Screen Analysis

SIZE	GRAMS	%
2 plus		
2-1 mm		
1-1/2 mm		
1/2-1/4 mm		
1/4-1/8 mm		
1/8-1/16		
Pan		
Total		100.0

MINERALOGICAL ANALYSIS

(Use opposite side of page for details of minerals)

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

Wt. of sample 66 gm. 100.0%
 Heavy Minerals .01 gm. 1.5%
 Light Minerals . gm. 98.5%

Shape Analysis:

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

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

Minerals Identified:
 Heavy Concentrate

No. of Grains	Rel. %
	0.0
1	0.2
29	4.8
323	53.9
245	40.9
Total	59 100%

Classification Grouping:

Primary Minerals: 88.8%

Absol. %

Epidote
 Barite
 Leucophaea
 Limonite Agg
 Pyrite

Epidote
 Leucophaea
 Clays

0.1
 88.7

Total 59 100%

Light Concentrate

Clays
 Chert

-90%
-10%

Secondary Minerals: 11.2%

Barite
 Limonite Agg
 Pyrite
 Chert

0.8
 0.6
 9.8

Total 100% Total 100%

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

Shale 95% 1/2 H gry calc 30% 50 1, soft friable, LS
 frags 49% bf mod xline hematite 12%