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12/28/94

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES FILE DATA

PRIMARY NAME: DETRITAL VALLEY SALT DEPOSIT

ALTERNATE NAMES:

MOHAVE COUNTY MILS NUMBER: 657A

LOCATION: TOWNSHIP 29 N RANGE 21 W SECTION 14 QUARTER ALL
LATITUDE: N 35DEG 53MIN 50SEC LONGITUDE: W 114DEG 30MIN 35SEC
TOPO MAP NAME: BLACK CANYON - 15 MIN

CURRENT STATUS: EXP PROSPECT

COMMODITY:
SODIUM COMMON SALT

BIBLIOGRAPHY:

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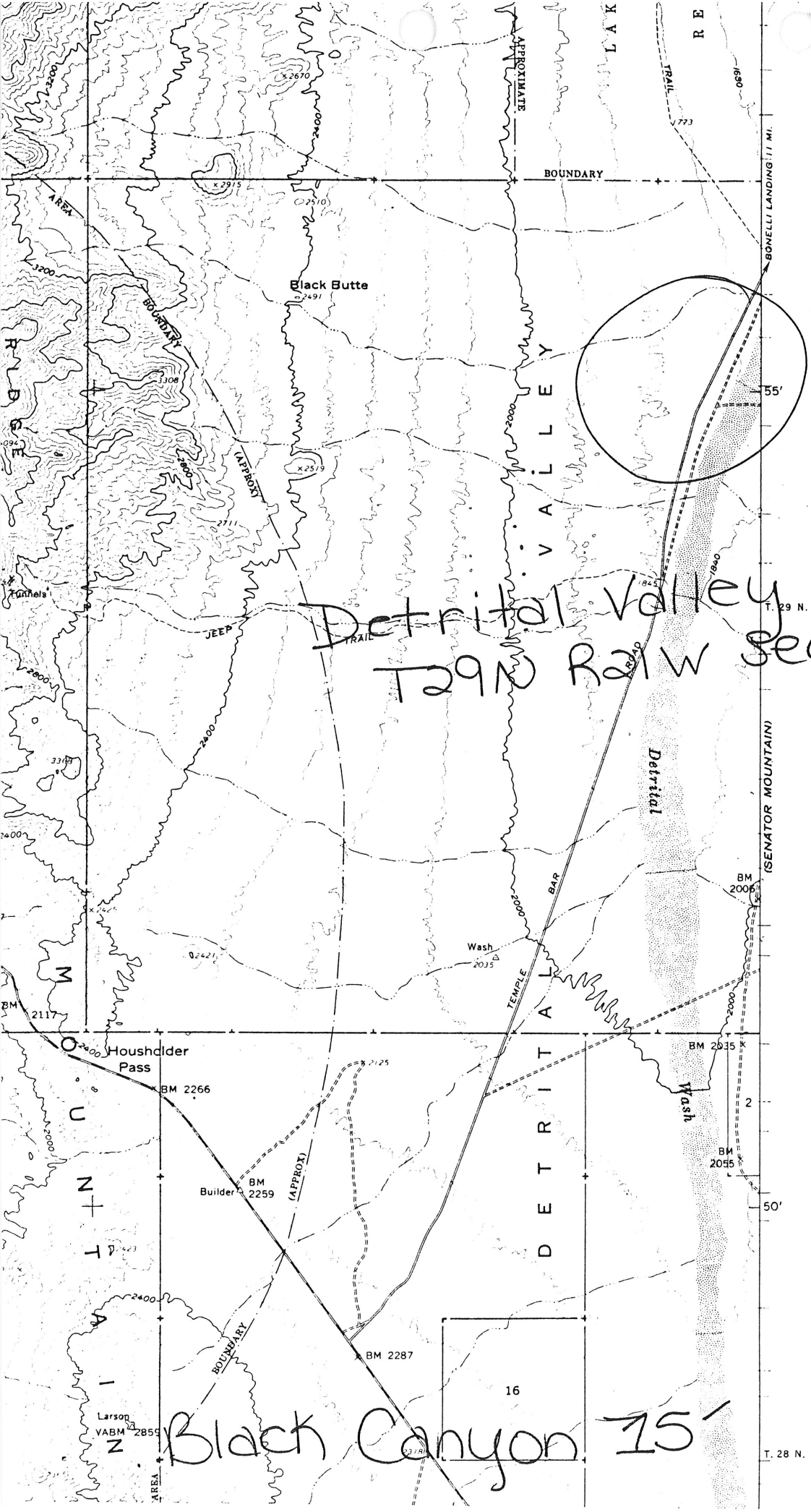
BLM LEASE FILE NO. AR 07763 & AR 07764
LEASE ALSO INCLUDES SEC. 2,11,12,15,22,23
"MINERAL & WATER RESOUCES OF AZ" AZBM BUL 180 P. 379, 1969
GREAT BASIN GEM JT. VENTURE, "MT. WILSON GEM RESOURCES AREA" VOL. 1 (ADMMR GEOLOGY FILE)
FIELDNOTES, VOL. 11, NO. 4, DEC. 1981
ANDERSON, R.E. "INFLUENCE OF LATE CENOZOIC ST RATIGRAPHY ON DIST. OF IMPOUNDMENT-RELATED SEISMICITY AT LK MEAD, NV-AZ" (ADMMR GEOLOGY FILE)
MANNION, L. E., VIRGIN VALLEY SALT DEPOSITS, CLARK COUNTY, NEVADA (AND MOHAVE COUNTY, ARIZONA): FROM THE FIRST SYMPOSIUM ON SALT, APPENDIX B, P. 168-175 IN SALT COMMODITY FILE, P. 168-175 IN SALT COMMODITY FILE


Detrital Valley Salt Deposit
T29N R21W Sec. 14, 11
Black Canyon 15'
APPROXIMATE
BOUNDARY
AREA
BONELLI LANDING 11 MI.
Black Butte
BOUNDARY
(APPROX)
JEEP
TRAIL
ROAD
TEMPLE BAR
Wash
Detrital
(SENATOR MOUNTAIN)
BM 2006
BM 2035
BM 2055
BM 2117
Houshalder Pass
BM 2266
Builder
BM 2259
(APPROX)
BM 2287
Larson
VABM 2859
16
55'
50'
T. 29 N.
T. 28 N.
DETRITAL VALLEY
CENTRAL MOUNTAINS
LAKE RE

# Stauffer Chemical Company Drill Logs

**Detrital Valley Salt Deposit (file) Mohave Co.**
**Red Lake Cavern (file) Mohave Co.**

Stauffer Chemical drilled 4 holes up to 3,000 feet deep during 1960-62. The holes are located in Nevada north of Detrital Valley across Lake Mead. The holes penetrate the Muddy Creek Formation evaporite sequence. The logs of the are of interest and relevant to the Detrital Valley Salt Deposit (file) and Red Lake Cavern (file). Copies are located in the Detrital Valley Salt file.

Nyal J. Niemuth
November 1994.

RH

# STAUFFER CHEMICAL COMPANY DRILL LOG



BEGUN 4/13/60 FINISHED 4/22/60 LOGGED BY L.E.M. DRILLED BY Armstrong Fowler Co. DRILL HOLE 380-

ELEV. 1340 TOTAL DEPTH 3058 LOCATION 778' N. & 401' E of S.W. cor. sec. 33, T 17S, R68 E, Sal 3070 (-) to 30



| FOOTAGE FROM | TO | THICKNESS | RECOVERY | FORMATION | LITHOLOGY | ORE MINERALS | ASSAY | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 0 | 65 | 65 | Cuttings | Alluvium | Gravels with local caliche beds up to 8' thick | | | 17' of 16" casing cemented into top of hole. Samples lost, flood by drilling mud. |
| 65 | 90 | 35 | " | Muddy Creek | Clay, buff to light buff | | | |
| 90 | 100 | 10 | " | " " | Clay, light greenish tan, sticky. | | | * All depths measured from kelly bushing 9.8' above ground level. |
| 100 | 150 | 50 | " | " " | Clay, light greenish gray, sticky. | | | |
| 150 | 330 | 180 | " | " " | Clay, light brown, locally greenish or grayish brown, sparse gypsum. Grades downward into more greenish brown clay; contact arbitrary. | | | |
| 330 | 500 | 170 | " | " " | Clay, sparse silt, slightly greenish brown, locally greenish gray. Grades into less green clay below, contact arbitrary. | | | |
| 500 | 650 | 150 | " | " " | Clay, local silt, light brown, with somewhat darker brown, sparse greenish brown; becomes somewhat more compact downward. | | | |
| 650 | 679 | 29 | " | " " | Basalt, very dark gray to black, fine grained. | | | Sample from 650.' to 660' shows mostly cla but there is a 10' l in receiving cuttings at top of hole. |
| 679 | 810 | 130 | " | " " | Clay and local silt, clay is greenish brown, silt is light brown, becoming | | | |

# STAUFFER CHEMICAL COMPANY DRILL LOG

BEGUN _____ FINISHED _____ LOGGED BY _____ DRILLED BY _____ DRILL HOLE SSC-1

ELEV. _____ TOTAL DEPTH _____ LOCATION _____ ORE _____ PAGE 2

| FOOTAGE FROM | FOOTAGE TO | THICKNESS | RECOVERY | FORMATION | LITHOLOGY | ORE MINERALS | ASSAY | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 810 | 1150 | 340 | Cuttings | Muddy Creek | Clay and fine silt, greenish brown tending toward brown downward, scarce light brown silt. Much is approaching soft shale in compactness; like 679' to 810'. | | | |
| 50 | 1170 | 20 | " | " " | Same as above, but with trace gray sand stone. | | | Trace of gypsum (anhydrite) at 1270' |
| 1170 | 1200 | 30 | " | " " | Clay and silt, brown, local greenish brown, with trace gray sandstone and trace (local) gypsum | | | |
| 1200 | 1310 | 110 | " | " " | Clay and silt, greenish brown to brown, local trace gypsum, sparse fine tanish gray sandstone. | | | |
| 1310 | 1360 | 50 | " | " " | Clay and silt, brown to greenish brown; 1% to 5% anhydrite, scattered. | | | |
| 1360 | 1420 | 60 | " | " " | Clay and silt, brown, local greenish brown, bare trace selenitic gypsum. | | | |
| 1420 | 1520 | 100 | " | " " | Clay and siltstone, brown to greenish brown, some selenite and anhydrite locally. | | | |
| 1520 | 1560 | 40 | " | " " | Clay and siltstone, brown to greenish brown, trace greenish gray, some selenite and anhydrite locally. | | | |
| 1560 | 1573 | 15 | " | " " | Anhydrite, gray to white impure with about 10% green shale; anhydrite is fine to coarsely crystalline. | | | |

# STAUFFER CHEMICAL COMPANY DRILL LOG

BEGUN_____ FINISHED_____ LOGGED BY_____ DRILLED BY_____ DRILL HOLE SSC-1

ELEV. G.L._____ DEPTH_____ LOCATION_____ PAGE 3

| FOOTAGE FROM | FOOTAGE TO | THICKNESS | RECOVERY | FORMATION | LITHOLOGY | MINERALS | ASSAY | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 1564 | 1573 | 9 | Core | Muddy Creek | Shale, brown, soft clayey with crystals and thin layers of anhydrite (?) or glauberite (?) | | | Core quite plasti when wet; difficu to core, much app jammed into barre Drag bit used. S penetration, up t 35 *min* per foot. |
| 1573 | 1655 | 82 | Cuttings | " " | Clay and siltstone, both shaly appearing locally, brown, locally greenish brown. | | | |
| 1655 | 1705 | 50 | " | " " | Clay and silt, brown, locally green brown and sparsely gray green; 10% to 30% anhydrite (?) and gypsum (?). Moderate efflorescence on cuttings after drying. | | | |
| 1705 | 1730 | 25 | " | " " | Same, but only 5% to 10% anhydrite (?) | | | |
| 1730 | 1750 | 20 | Core 7' | " " | Clay shale, brown, soft to locally firm, 0.1' of brownish gray saccharoidal anhydrite (?) at top. | | | Bedding horizonta |
| 1750 | 1770 | 20 | Cuttings | " " | Clay shale and siltstone, brown to light brown, local gray, sparse glauberite, slight efflorescence | | | |
| 1770 | 1800 | 30 | " | " " | Clay shale and glauberite, brown-gray brown shale, light gray to white, hydrated glauberite | | | |

# STAUFFER CHEMICAL COMPANY DRILL LOG

BEGUN_____ FINISHED_____ LOGGED BY_____ DRILLED BY_____ DRILL HOLE SSC-1

ELEV. G.L._____ DEPTH_____ LOCATION_____ PAGE 4

| FOOTAGE FROM | FOOTAGE TO | THICKNESS | RECOVERY | FORMATION | LITHOLOGY | MINERALS | ASSAY | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 1800 | 1850 | 50 | Cuttings | Muddy Creek | Shale and local clay, brown, light brown, and about 10% gray shale. Much less clay, becoming fairly lithified in part; sparse glauberite. | | | |
| 1850 | 1920 | 70 | " | " " | Shale and siltstone, brown, local gray brown, local light gray; 5% to 20% glauberite (?); sparse, soft, round particles of unknown saline, possibly partly dissolved glauberite. | | | |
| 1920 | 1976 | 56 | " | " " | Shale and local siltstone, brown; locally considerable light gray and gray brown; sparse to local glauberite. Local slight efflorescence. | | | |
| 1976 | 1986 | 10 | Core "9" | " " | Glauberite, light to medium gray, impure, contains brown siltstone layers 25%; bedding is wavy. | | | Bedding wavy but nearly horizontal |
| 1977.4 | 1986 | 8.6 | 7.6 | " " | Interbedded shale, siltstone, sandstone, and glauberite; shale is clayey, brown and gray green; sandstone is light brownish gray; glauberite is gray. Dried core contains salty tasting efflorescence. | | | Bedding generally horizontal but di of 20° appears on anhydrite layerin 8" from bottom. |
| 1986 | 2030 | 44 | Cuttings | " " | Shale and clay, brown to gray brown, locally gray, trace of gypsum increasing downward, trace efflorescence at top increasing to moderate at bottom. | | | |

# STAUFFER CHEMICAL COMPANY DRILL LOG

SSC-1

BEGUN_____ FINISHED_____ LOGGED BY_____ DRILLED BY_____ DRILL HOLE SS

ELEV. G.L._____ DEPTH_____ LOCATION_____ PAGE 5

| FOOTAGE FROM | FOOTAGE TO | THICKNESS | RECOVERY | FORMATION | LITHOLOGY | MINERALS | ASSAY | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 2030 | 2070 | 40 | Cuttings | Muddy Creek | Shale, clay, and gypsum or anhy- brown to light brown and buff to white; gypsum or anhydrite makes 20% to 40% of rock; heavy efflorescence; chloride content of drilling mud increasing. | | | |
| 2070 | 2100 | 30 | " | " " | Shale, clay, and anhydrite or gypsum, light brown to brown and buff to white; anhydrite or gypsum makes up 30% to 50% of rock; strong efflorescence to 2090, moderate to 2100'. | | | Possible salt 2070 2100 |
| 2100 | 2110 | 10 | " | " " | Shale and clay, brown, some anhydrite or gypsum; heavy efflorescence on dry cuttings. Unknown hard rhombohedral (?) mineral (glauberite?) | | | |
| 2110 | 2119 | | | | No sample | | | |
| 2119 | 2148.7 | 29.7 | 29.5 | Muddy Creek | Halite 90%, light gray to brownish, because of occluded clay; contains irregular blebs and small masses of gray, fine sandstone irregularly distributed through core; some euhedral crystals of glauberite | | | Core Number 1 |
| 2148.7 | 2154 | 5.3 | 5.3 | " " | Halite, light gray, 80%; irregularly distributed, irregular masses of fine sandstone impregnated with salt; saccharoidal, anhydrite and sparse anhydrite(?) or glauberite (?) crystals, gray, brown and white. | | | |

# STAUFFER CHEMICAL COMPANY DRILL LOG

BEGUN_____ FINISHED_____ LOGGED BY_____ DRILLED BY_____ DRILL HOLE 1 SSC

ELEV. G.L._____ DEPTH_____ LOCATION_____ PAGE 6

| FOOTAGE FROM | FOOTAGE TO | THICKNESS | RECOVERY | FORMATION | LITHOLOGY | MINERALS | ASSAY | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 2154 | 2176.1 | 22.1 | 20. | Muddy Creek | Glauberite, light gray to white, coarsely crystalline, 85% with only sparse beds of fine brownish gray siltstone 10%. Less than 5% halite in thin beds, most abundant toward bottom. | | | Dips horizontal up to 20 degrees. |
| 76.1 | 2185.4 | 9.3 | 8.5 | | Glauberite, very light gray, coarsely crystalline to very coarsely crystalline 65%; halite, coarsely crystalline 35%; 0.3' brown siltstone from 2180.1' to 2180.4'. | | | |
| 2185.4 | 2191.4 | 6 | 6 | | Halite, very light gray to white, coarsely crystalline, 75% to 80%; glauberite, coarse crystals, white, irregularly distributed; 20%; tuff, light gray, fine grained, bedded, 0.7' from 2190.7' to 2191.4'. | | 70% to 80% | Dips horizontal t 15 degrees. |
| 2191.4 | 2215.5 | 24.1 | 17.4 | | Halite, light gray, locally white, fairly pure in top 4.4', remainder contains 35% to 40% medium coarse to coarsely crystalline glauberite, some enclosed in and fine sandstone in irregular masses and beds. | | 4.4'-95% 19.7'-30% to 40% | Dips up to 15 deg Mostly rather fla dips. From 2213. to 2215.0 is fine gray. brown sandst with only a few glauberite crysta and trace of salt |
| 2215.5 | 2229 | 13.5 | 13.5 | | Halite, white to light gray, 95% plus | | 95% | |
| 2229 | 2237.3 | 8.3 | 8.3 | | Halite, 75% gray to light gray; glauberite in medium coarse crystals and masses. | | 75% | |
| 2237.3 | 2244.3 | 7 | 7 | Muddy Creek | Halite, light gray, coarsely crystalline 95%. | | 95% | |

STAUFFER CHEMICAL COMPANY DRILL LOG

BEGUN _____ FINISHED _____ LOGGED BY _____ DRILLED BY _____ DRILL HOLE SSC-1

ELEV. G.L. _____ DEPTH _____ LOCATION _____ PAGE 7

| FOOTAGE FROM | FOOTAGE TO | THICKNESS | RECOVERY | FORMATION | LITHOLOGY | MINERALS | ASSAY | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 2244.3 | 2250.5 | 6.2 | 4.7 | Muddy Creek | Halite 45%, glauberite (?), coarsely crystalline, euhedral 55%. | | 45% | 3 feet of core were lost from bottom of core #9, 1.5 feet of which is assigned to the glauberite beari section |
| 2250.5 | 2257.9 | 7.4 | 7.4 | " | Halite, coarsely crystalline 90% | | 90% | |
| 2257.9 | 2261.6 | 3.7 | 3.7 | | Halite, 50%; fine and coarse, euhedral glauberite and fine gray brown silty sandstone. | | 50% | |
| 2261.6 | 2301 | 40.6 | 40 | | Halite, white to brownish gray 90% to 95%, local blebs and interstitial fillings of fine, impure, sandstone, 5%. | | 94% | "Ice cream salt" fro 2267.5' - 2272.5'. |
| 2301 | 2326 | 25 | 4' | Muddy Creek | Halite, poor recovery, probably mostly halite 90% as above and below | | 88% | A 2" light greenish buff tuff at 2326.5( Location not certain because core box als has core labelled 22 in it. |
| 2326 | 2338 | 14 | 14 | " | Halite, white to light gray 90% | | 90% | |
| 2338 | 2347 | 9 | 9 | " | Halite, light gray to light gray brown 60%; fine to coarse glauberite and light gray brown, fine silty sandstone interstitial to salt crystals; a fine sandstone bed at 2342.65' to 2342.5' | | 60% | Dips up to 15 degree |
| 2347 | 2368 | 21 | 18 | | Halite 85%; silty, brown sandstone, irregularily distributed as irregular masses containing medium fine to medium coarse glauberite. | | | |

# STAUFFER CHEMICAL COMPANY DRILL LOG

BEGUN_____ FINISHED_____ LOGGED BY_____ DRILLED BY_____ DRILL HOLE 1 SS(

ELEV. G.L._____ DEPTH_____ LOCATION_____ PAGE 8

| FOOTAGE FROM | FOOTAGE TO | THICKNESS | RECOVERY | FORMATION | LITHOLOGY | MINERALS | ASSAY | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 2368 | 2393 | 25 | 4.5 | | Halite 75% in core recovered; glauberite, white, coarse and fine in irregularly distributed crystals and masses and in 3 or 4 thin layers. | | 75% | Dips flat to 10° |
| 2393 | 2567.4 | 174 | 174 | | Halite, white, very light gray and brownish, coarsely crystalline, contains finely disseminated brown silt and clay and also blebs and small masses irregularly distributed through some parts. Purity ranges up to almost 100%, probably average is 93 to 95%. Conspicuous impure zones; from 2479' to 2480.5' coarse glauberite (?) crystals; 85%; from 2470' to 2472.25' fine, saccharoidal light brown sandstone 75%. Pure white milky salt from 2559' to 2567.4' with 0.6' of massive glauberite at top; milky salt also at 2549' to 2553. | | 90%-95% | Sheared salt, shear parallel to beddin from 2441-2444.5. |
| 2567.4 | 2577 | 9.6 | 4.3 | Muddy Creek | Halite, brownish gray, with irregular seams and blebs of sandstone in top 2.7'; bottom 1.5' is gray brown, saccharoidal glauberite and sandstone with some halite | | 85%<br>15% | Core #23 |
| 2577 | 2585.4 | 8.4 | 8.4 | | Halite, light gray, 75%, with irregular masses of brown siltstone with glauberite 25%. | | 70% | Core #24 |
| 2585.4 | 2647 | 61.6 | 48.3 | | Halite, coarsely crystalline, gray brown to light gray; fine blebs and films of interstitial clay and silty sand; local small masses of silt. | | 92% | Cores #24,25, and<br>Recov.# 24-25 of 2<br>" #25-20 of 20<br>" #26-11.70 of |

# STAUFFER CHEMICAL COMPANY DRILL LOG

BEGUN_____ FINISHED_____ LOGGED BY_____ DRILLED BY_____ DRILL HOLE 1 SSC

ELEV. G.L._____ DEPTH_____ LOCATION_____ PAGE 9

| FOOTAGE FROM | FOOTAGE TO | THICKNESS | RECOVERY | FORMATION | LITHOLOGY | MINERALS | ASSAY | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 2647 | 2672 | 25 | 9 | | Halite, very light gray to gray brown, coarsely crystalline; conspicuous efflorescence on core | | 90% | Core #27-9' of 25' Core badly ground especially at top. |
| 2672 | 2687 | 15 | 14 | | Halite, light gray to gray brown, with fine to medium blebs and films of siltstone; 1.1' of very light greenish gray, salt impregnated tuff from 2673.5(+)' to 2674.6'(+). | | 88% | Core #28 18.9' of |
| 2687 | 2693.8 | 6.8 | 5.5 | | Halite, light brown to light gray, has mosaic appearance with intersitial brown clay and glauberite. | | 60% | |
| 2693.8 | 2739 | 45.2 | 42.6 | | Halite, very light gray to gray brown, with irregularly distributed blebs and interstitial films of silt and clay. | | 90% | Core #29-21.9' of 2 Core #30-23.5' of 2 |
| 2739 | 2763 | 45.2 | 4.6 | Muddy Creek | Same as above probably for the entire run although only a few rounded pieces were recovered. | | 90% | Used rock bit Core #31 - 4' of 24 |
| 2763 | 2773 | 10 | 1 | " | Probably same as above, only fragments and rounded pieces recovered. | | 90% | Used tungsten carbi solid ring bit Core #32 - 1' of 10 |
| 2773 | 2793 | 20 | 20 | | Halite, white to gray brown, coarsely crystalline with small to medium blebs of shale and films on crystal boundaries. | | 91% | Core #33-20' of 20' |
| 2793 | 2818 | 25 | 7.4 | | Halite, gray brown to brown, coarsely crystalline, irregularly distributed blebs of siltstone and clay. | | | Core #34 - 7.4' of |
| 2818 | 2837 | 19 | 18.4 | | Halite, white to gray brown, contains several intervals of heavily silt - and clay- contaminated salt, 2829' to 2832.5' and 2836.5' to 2837'; some glauberite | | 88% | Core #35 - 18.6 of |

# STAUFFER CHEMICAL COMPANY DRILL LOG

BEGUN_____ FINISHED_____ LOGGED BY_____ DRILLED BY_____ DRILL HOLE SSC-1

ELEV. G.L._____ DEPTH_____ LOCATION_____ PAGE 10

| FOOTAGE FROM | FOOTAGE TO | THICKNESS | RECOVERY | FORMATION | LITHOLOGY | MINERALS | ASSAY | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 2837 | 2858 | 21 | 20.5 | | Halite, gray brown to very light gray, contains fine to locally medium, blebs and films of clay. | | 91% | Core #36 - 24.6' of |
| 2858 | 2862 | 4.1 | 4.1 | | Halite, white, pure, coarsely crystalline. | | 100% | |
| 862 | 2895.8 | 33.8 | 27.5 | | Halite, white, to gray brown, irregularly distributed, sparse clay and siltstone blebs. | | 92% | |
| 2895.8 | 2908 | 12.2 | 12 | | Halite, gray brown, irregularly distributed, large and small blebs and films of clay and glauberite | | 88%<br>91% | |
| 2908 | 2933.5 | 25.5 | 25 | | Halite, white to gray and gray brown, small to medium blebs and films of shale. | | 91% | Shows diagonal fracturing and loc slickensides w/30 degree dip. |
| 2933.5 | 2954.25 | 20.75 | 19 | | Halite, white to gray and brown mosaic structure, irregularly distributed silt and silty sandstone in locally considerable amounts probably mixed with glauberite; from 2938.5' to 2939' glauberite impregnated silt, from 2952.75' to 2953.25' is 90% clay. | | | |
| 2954.25 | 2957.25 | 3 | 3 | | Halite, white clear | | 100% | |
| 2957.25 | 2968 | 10.75 | 9½ | | Halite, gray and white and tan, mosaic structure, sandy siltstone, red brown, 2958' to 2958.75' | | 80% | |
| 2968 | 2997 | 29 | 21 | | Halite, gray and white and tan, considerable interstitial clay, coarsely crystalline, but shattered | | 90% | |

# STAUFFER CHEMICAL COMPANY DRILL LOG

BEGUN_____ FINISHED_____ LOGGED BY_____ DRILLED BY_____ DRILL HOLE 1 SSC-

ELEV. G.L._____ DEPTH_____ LOCATION_____ PAGE 11

| FOOTAGE FROM | FOOTAGE TO | THICKNESS | RECOVERY | FORMATION | LITHOLOGY | MINERALS | ASSAY | REMARKS |
|---|---|---|---|---|---|---|---|---|
| | | | | | generally; some coarse granular appearing salt; tends to break up into small, eroded pieces of core with rubbly, granular appearance | | | |
| 2997 | 3028 | 31 | 24.0 | | Halite, clear to gray and gray brown; local blebs of siltstone. | | 94% | |
| 3028 | 3037 | 9 | 2 | | Sandy siltstone 40%, brown medium soft; halite, gray brown 60%. | | 60% | |
| 3037 | 3058 | 21 | 19 | | Halite, white to gray and gray brown, coarsely crystalline | | 91% | Total depth 3058' |

# STAUFFER CHEMICAL COMPANY DRILL LOG

BEGUN 5/6/60 FINISHED 5/17/60 LOGGED BY Jefferson DRILLED BY Armstrong Fowler Company DRILL HOLE SSC-2 (+) 1

ELEV. G.L. 1318 DEPTH 3634 LOCATION 1258'N. & 398'W. of S.E. cor.sec. 33,T17S,R.68E.Ore Salt 1878-3634 PAGE 1

| FOOTAGE FROM | FOOTAGE TO | THICKNESS | RECOVERY | FORMATION | LITHOLOGY | MINERALS | ASSAY | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 0 | 40 | 40 | Cuttings | Alluvium | Clay, buff to light reddish brown, and limestone fragments, sand, and gravel. | | | All depths measured from kelly bushing above ground level. |
| 40 | 180 | 140 | " | Muddy Creek | Clay to very soft shale, reddish brown to buff; trace of gypsum. | | | 18" of 6" casing projects from hole; casing has 2-2" p with plugs. 6" cas contains a 3" tub projecting 4" abo top of 6". Annulus 3" tubing have we caps. |
| 180 | 480 | 300 | " | | Shale, reddish brown to buff, some brick red, trace light greenish gray, all very soft; slightly silty; probably thin silty and sandy beds at irregular intervals; silty material becomes more common downward, may be as high as 20% in some samples; trace gypsum as fragments of large clay filled crystals. | | | |
| 480 | 500 | 20 | " | | Basalt, black, very fine grained, amygdaloidal 85%, amygdules are very fine grained, white, in radiating clusters, probably a zeolite; shale, brown to light reddish brown, very soft 15%. | | | Black Point basalt member |
| 500 | 520 | 20 | " | | As above, basalt 50%; shale 50% | | | " |
| 520 | 560 | 40 | | | Basalt, black, very fine grained, no amygdules 80%; shale as above 20%. | | | " |
| 560 | 580 | 20 | " | | Shale, brick red, very soft, almost a clay 80%; basalt, as above 15%; tuff, white, very fine grained, hard, with small biotite flakes 5%. | | | |
| 580 | 700 | 20 | " | | Clay, greenish brown, with a trace of silty material; trace of gypsum. | | | |

# STAUFFER CHEMICAL COMPANY DRILL LOG

BEGUN_____ FINISHED_____ LOGGED BY_____ DRILLED BY_____ DRILL HOLE SSC-2

ELEV. G.L._____ DEPTH_____ LOCATION_____ PAGE 2

| FOOTAGE FROM | FOOTAGE TO | THICKNESS | RECOVERY | FORMATION | LITHOLOGY | MINERALS | ASSAY | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 700 | 960 | 260 | Cuttings | | Shale, reddish brown to buff, some brick red, soft to medium soft, color changing to greenish brown at depth; trace silty material; 5% gypsum from 840' to 920'. | | | Slight efflorescenc cuttings beginning 920'. |
| 960 | 1180 | 220 | " | | Shale, greenish brown, soft to medium soft, some brick red, medium soft, all somewhat harder than above, trace gypsum; some silty material; 5% gypsum from 1120' to 1180'. | | | |
| 1180 | 1200 | 20 | " | | Shale, brown to greenish brown, soft, 70% shale, light grayish green to gray, medium soft 20%; gypsum 10%. | | | |
| 1200 | 1320 | 120 | " | Muddy Creek | As above, shale, brown to greenish brown 85%; light grayish green to light gray shale 10%; gypsum 5%. | | | |
| 1320 | 1540 | 220 | " | | As above, shale, brown to greenish brown 60%; shale, light grayish green to light gray 30%; gypsum 10% from 1460' to 1500' gypsum reaches 30%. | | | |
| 1540 | 1780 | 240 | " | | Shale, grayish green to light gray 50%; shale, greenish brown to brown 40%; gypsum 10%; both shales are soft to medium soft; from 1580' to 1620' gypsum reaches 30%; percentage of grayish green shale increases with depth to 70% at 1780'. | | | |
| 1780 | 1800 | 20 | " | | No sample. | | | |
| 1800 | 1820 | 20 | " | | Shale, gray green 50%; shale, light gray 20%; both soft; gypsum 30%. | | | |

# STAUFFER CHEMICAL COMPANY DRILL LOG

BEGUN_____ FINISHED_____ LOGGED BY_____ DRILLED BY_____ DRILL HOLE 2 SS

ELEV. G.L._____ DEPTH_____ LOCATION_____ PAGE 3

| FOOTAGE FROM | FOOTAGE TO | THICKNESS | RECOVERY | FORMATION | LITHOLOGY | MINERALS | ASSAY | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 1820 | 1830 | | | | No sample | | | |
| 1830 | 1835.45 | 5.45 | 5.45 | Muddy Creek Top of Core | Glauberite, white, coarsely to very coarsely crystalline, with shale, light greenish gray, medium hard, as partings and laminations. Shale about 15%; shale becoming somewhat sandy toward base, stringly gypsiferous. | | | |
| 1835.45 | 1843.3 | 7.85 | 7.85 | | Glauberite, white, coarsely to very coarsely crystalline as bands and euhedral crystals 80%; siltstone brown to very light reddish brown, almost a sandstone in places, poorly cemented 20%; 100% glauberite 1839' to 1840.4'. | | | At 1839 5°dip. |
| 1843.3 | 1857.5 | 14.2 | 14.2 | | Glauberite, white, as masses of interlocking euhedral crystals and as bands 85%; shale, brown to light reddish brown and grayish green, somewhat silty in places, as partings 15%; local tuffaceous, fine, tan to brown sandstone; some clay. | | | |
| 1857.5 | 1865.4 | 7.9 | 1.2 | | Core consists of fragments of very soft brown shale and fine sandstone. | | | |
| 1865.4 | 1877.0 | 11.6 | 11.6 | Muddy Creek | Glauberite, white, as euhedral crystals, interlocking masses of same, and as bands 90% with a matrix of brown very soft siltstone and shale (in places medium soft). | | | |
| 1877 | 1878.5 | 1.5 | 1.5 | | Shale, light grayish brown, soft to very soft with 30% glauberite (?) as | Halite | 5% NaCl | Dips 0°to 5° Top of salt |

# STAUFFER CHEMICAL COMPANY DRILL LOG

BEGUN_____ FINISHED_____ LOGGED BY_____ DRILLED BY_____ DRILL HOLE 2 SS

ELEV. G.L._____ DEPTH_____ LOCATION_____ PAGE 4

| FOOTAGE FROM | FOOTAGE TO | THICKNESS | RECOVERY | FORMATION | LITHOLOGY | MINERALS | ASSAY | REMARKS |
|---|---|---|---|---|---|---|---|---|
| | | | | | euhedral crystals; glauberite increasing toward base and small bands and partings of halite appearing; transition is gradational from shale through glauberite to halite - glauberite. | | | |
| 1878.5 | 1880 | 1.5 | 1.5 | | Halite, coarsely crystalline, transparent, with glauberite and brown, very soft shale; halite increasing from 15% to 90% +. | | 50% NaCl | |
| 1880 | 1805 | 5.0 | 5.0 | | Halite, transparent, medium to very coarsely crystalline with partings and laminations of grayish green to brown shale and associated with euhedral glauberite crystals. | | 85-90% NaCl | |
| 1885 | 1890 | 5.0 | 0.0 | Muddy Creek | No recovery. | | | |
| 1890 | 1904 | 14.0 | 14.0 | | Halite, transparent, with thin partings of brown, soft, tuffaceous siltstone and white glauberite; glauberite 30% in bottom .8'. | | 90% NaCl | |
| 1904 | 1920 | 16 | 0.0 | | No recovery | | | |
| 1920 | 1942.9 | 22.9 | | | Glauberite, white to light gray, as interlocking masses of very coarse to coarse, euhedral crystals and as bands; sparse, interstitial blebs, whisps, and partings of shale, grayish brown, soft; halite irregularly distributed as bands and interstitial filling. | | NaCl 50% | Bedding dips 0°-9° Somewhat wavy |

# STAUFFER CHEMICAL COMPANY DRILL LOG

BEGUN_____ FINISHED_____ LOGGED BY_____ DRILLED BY_____ DRILL HOLE 2 SS

ELEV. G.L._____ DEPTH_____ LOCATION_____ PAGE 5

| FOOTAGE FROM | FOOTAGE TO | THICKNESS | RECOVERY | FORMATION | LITHOLOGY | MINERALS | ASSAY | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 1942.9 | 1976.5 | 33.6 | 33.6 | | Halite, transparent, coarsely crystalline to very coarsely crystalline with scattered coarse to very coarse, euhedral crystals and local beds of glauberite; local thin partings of fine grained, light gray and light brown, fine sandstone and clay. | | 85-90% | Dip about 5°. |
| 1976.5 | 1977.5 | 1.5 | 1.5 | | Glauberite, as interlocking very coarse euhedral crystals with light gray clay and some halite. | | 10% NaCl | |
| 1977.5 | 1980 | 2.5 | 0.0 | Muddy Creek | No recovery. | | | |
| 1980 | 1987.4 | 7.4 | 7.4 | | Halite, transparent, with local euhedral crystals of white glauberite; blebs and bits of light gray to light brown, very fine sandstone and siltstone. | | 90%+NaCl | |
| 1987.4 | 1992.4 | 5.0 | 5.0 | | As above | | 80%NaCl | |
| 1992.4 | 1998.5 | 6.1 | 6.1 | | As above | | 90%NaCl | |
| 1998.5 | 2010 | 11.5 | 0.0 | | No recovery. | | | |
| 2010 | 2018.2 | 8.2 | 8.2 | | Halite, coarsely crystalline with shaly, sandy appearing anhydrite (?). | | 80% NaCl | Core badly ground. |
| 2018.2 | 2036.4 | 18.2 | 18.2 | | As above. | | 90%+NaCl | |
| 2036.4 | 2040 | 3.6 | 0.0 | | No recovery. | | | |
| 2040 | 2041.1 | 1.1 | 1.1 | | Tuff (?), fine grained, light gray with halite. | | 40%NaCl | Tuffaceous appeari but very soft and least in part, gypsiferous. |

# STAUFFER CHEMICAL COMPANY DRILL LOG

BEGUN _____ FINISHED _____ LOGGED BY _____ DRILLED BY _____ DRILL HOLE 2 SS

ELEV. G.L. _____ DEPTH _____ LOCATION _____ PAGE 6

| FOOTAGE FROM | FOOTAGE TO | THICKNESS | RECOVERY | FORMATION | LITHOLOGY | MINERALS | ASSAY | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 2041.1 | 2070 | 28.9 | 4.8 | | Halite, transparent, very coarsely crystalline, with very thin partings and laminations of reddish brown, sandstone. | | 95%NaCl | An additional thr feet of mixed gra brown, very soft and halite recove 25% NaCl. |
| 2070 | 2100 | 30.0 | 10.5 | Muddy Creek | As above. | | 90%NaCl | |
| 2100 | 2102 | 2.0 | 2.0 | | Halite, transparent, very coarsely crystalline, with thin partings and laminations of light greenish gray shale, with associated white, very coarse, euhedral crystals of glauberite. | | 60%NaCl | At 2099.5 to 2100 2" & 3" to 4" of to greenish tuff. |
| 2102 | 2148 | 46 | 46 | | Halite, transparent, very coarsely crystalline, with thin partings and laminations of reddish brown siltstone and very fine sandstone with associated white euhedral crystals of glauberite, locally coarse. | | 85%NaCl | Dips less than 10' |
| 2148 | 2180 | 32 | 0.0 | | No recovery. | | | |
| 180 | 2190 | 10 | 10 | | As above. | | 80%+NaCl | |
| 2190 | 2220 | 30 | 27.0 | | As above. | | 75%+NaCl | |
| 2220 | 2288.9 | 60.9 | 60.1 | | As above . | | 90%+NaCl | 8.0' correction m (2280' to 2288'). |
| 2288.9 | 2313.4 | 24.5 | 24.5 | | As above. | | 90%+NaCl | |
| 2313.4 | 2318 | 4.6 | 0 | | No recovery. | | | |
| 2318 | 2339 | 21.0 | 21.0 | | Halite, transparent, coarsely crystalline, somewhat shattered, with thin partings of reddish brown, fine | | 90%NaCl | 70% NaCl, 2331.7'- 2333' |

# STAUFFER CHEMICAL COMPANY DRILL LOG

BEGUN_____ FINISHED_____ LOGGED BY_____ DRILLED BY_____ DRILL HOLE 2 SS

ELEV. G.L._____ DEPTH_____ LOCATION_____ PAGE 7

| FOOTAGE FROM | FOOTAGE TO | THICKNESS | RECOVERY | FORMATION | LITHOLOGY | MINERALS | ASSAY | REMARKS |
|---|---|---|---|---|---|---|---|---|
| | | | | | sandstone, and reddish brown, very soft clay; sparse, scattered, euhedral crystals of white glauberite. | | | |
| 2339 | 2379.5 | 40.5 | 40.5 | | As above. | | 95%+NaCl | |
| 2379.5 | 2417 | 37.5 | 36.4 | | As above; 0.45' greenish gray, tuffaceous, very soft clay, at 2416.4'. | | 90%NaCl | 2399' to 2401' is of very light gray, salt saturated tuf with some biotite 19" of brown silty fine sandstone wit glauberite crystal in lower 1/3 grad to medium crystal glauberite in bott 3 inches. Glauber salt contact at b is sharp; flat dips |
| 2417 | 2438 | 21 | 0 | | No recovery. | | | |
| 2438 | 2444 | 6 | 6 | | As above. | | 90%NaCl | At 2414 wavy dip less than 5°. |
| 2444 | 2450 | 6 | 6 | | As above. | | 85%NaCl | 2446-2454 locally shattered salt. |
| 2450 | 2465 | 15 | 15 | | As above. | | 95%NaCl | |
| 2465 | 2505.3 | 40.3 | 37.6 | | As above. | | 85%-90%NaCl | |
| 2505.3 | 2535 | 29.7 | 0 | | No recovery. | | | |
| 2535 | 2542 | 7.0 | 7.0 | | As above; .2' reddish brown clay @ base. | | 90%NaCl | |
| 2542 | 2565 | 23 | 0 | | No recovery. | | | |
| 2565 | 2571 | 6 | 6 | | As above; .2' ground halite and | | 90%NaCl | Locally shattered |

# STAUFFER CHEMICAL COMPANY DRILL LOG

BEGUN_____ FINISHED_____ LOGGED BY_____ DRILLED BY_____ DRILL HOLE 2 SS

ELEV. G.L._____ DEPTH_____ LOCATION_____ PAGE 8

| FOOTAGE FROM | FOOTAGE TO | THICKNESS | RECOVERY | FORMATION | LITHOLOGY | MINERALS | ASSAY | REMARKS |
|---|---|---|---|---|---|---|---|---|
| | | | | | glauberite at top and .7' ground clay, glauberite and halite @ base. | | 90%NaCl | Locally shattered |
| 2571 | 2595 | 24 | 0 | | No recovery. | | | |
| 2595 | 2640.2 | 55.2 | 53.4 | | As above; 1.4', 60% NaCl, 2603.6'-2604'; remainder sandy appearing, reddish brown fine sandstone. | | 90%NaCl | |
| 2640.2 | 2660 | 19.8 | 0 | | No recovery. | | | |
| 2660 | 2689 | 29 | 29 | | Halite, transparent, coarsely granular, (in places, has texture of ice cream salt), with glauberite (.) as sparse white crystals and as reddish brown, sandy appearing zones; some reddish clay as partings and laminations. | | 95%NaCl | |
| 2689 | 2703 | 14 | 14 | | As above; .5' sandy glauberite(?), 2691'-2691.5'; .3' 2695'-2695.3' | | 85%NaCl | |
| 2703 | 2746 | 43 | 43 | | As above; .5' fine sandstone at base | | 90%NaCl | |
| 2746 | 2773 | 27 | 6.10 | | As above | | 90%NaCl | Salt at least local shattered |
| 2773 | 2793 | 20 | 7.0 | | As above | | 90%NaCl | |
| 2793 | 2800 | 7 | Cuttings | | No sample | | | Returned to drillin because of poor cor recovery. |
| 2800 | 2820 | 20 | " | | Shales, probably all from up the hole. | | | |
| 2820 | 2900 | 80 | " | | Halite, but not showing in cuttings until 2860'. | | | |
| 2900 | 2920 | 20 | 13.1 | | Halite, transparent, with some | | 90%+NaCl | Salt in part shatte and rubbly. |

# STAUFFER CHEMICAL COMPANY DRILL LOG

BEGUN_____ FINISHED_____ LOGGED BY_____ DRILLED BY_____ DRILL HOLE 2 SS

ELEV. G.L._____ DEPTH_____ LOCATION_____ PAGE 9

| FOOTAGE FROM | TO | THICKNESS | RECOVERY | FORMATION | LITHOLOGY | MINERALS | ASSAY | REMARKS |
|---|---|---|---|---|---|---|---|---|
| | | | | | glauberite, as sandy appearing, reddish brown material, and as large white euhedral crystals, some reddish brown clay as partings. | | | |
| 2920 | 2940 | 20 | 1.0 | | As above. | | 90%+NaCl | |
| 2940 | 2980 | 40 | Cuttings | | Shale 60%, decreasing to 40%; halite 40-60%. | | | Shale from mostly f up the hole; percen in cuttings not in dicative of quali of salt. |
| 2980 | 3020 | 40 | " | | Halite 60% - 70%; shale 30%-40%. | | | |
| 3020 | 3040 | 20 | " | | Shale 60¢; shale, mostly brown to greenish brown; halite, 40%. | | | |
| 3040 | 3080 | 40 | " | | Halite, 70%; shale, 30%. | | | |
| 3080 | 3420 | 340 | " | | Halite, 80% - 90%; shale, 10% -20%. | | | |
| 3420 | 3440 | 40 | " | | Halite, 70%-80%; shale, 20% - 30% | | | |
| 3440 | 3634 | 194 | " | | Halite, 80% - 90%; shale, 10% - 20% | | | Total depth 3634'. |

# STAUFFER CHEMICAL COMPANY DRILL LOG



BEGUN 5/19/60 FINISHED 5/23/60 LOGGED BY Jefferson DRILLED BY Armstrong Fowler Company DRILL HOLE SSC-3

ELEV. 1408 TOTAL DEPTH 2237 LOCATION 1436'N. & 1257'W. of S.E. cor. sec. 28, T17S, R.68E. ORE

| FOOTAGE FROM | TO | THICKNESS | RECOVERY | FORMATION | LITHOLOGY | ORE MINERALS | ASSAY | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 0 | 60 | 60 | Cuttings | | No sample. | | | All depths measured fr kelly bushing 9.8' ab ground level. |
| 60 | 100 | 40 | " | Alluvium | Clay and gravel. | | | |
| 100 | 160 | 60 | " | Muddy Creek | Clay, light reddish brown | | | |
| [illegible]0 | 220 | 60 | " | | Clay to very soft shale, light reddish brown 60%; shale, light greenish gray, very soft 40%; trace gypsum. | | | |
| 220 | 260 | 40 | " | | Shale, very soft, light reddish brown, 50%; shale, soft, greenish brown 50%; trace to 5% gypsum. | | | |
| 260 | 440 | 180 | " | | As above; reddish shale decreasing to 30%; brownish increasing to 65%; gypsum 5%; from 340' to 400', gypsum 10%; from 400' to 440', gypsum, 15% to 20%. | | | Slight efflorescence beginning at 360'. |
| [illegible]0 | 460 | 20 | " | | Shale, soft, greenish brown, 50%; shale, soft to very soft, light reddish brown, 20%; sandstone, soft, light gray to gray, 15%; gypsum, 15%. | | | |
| 460 | 650 | 190 | " | | Shale, soft, greenish brown, 65%; shale, soft, light reddish brown, 20%; gypsum 15%; from 620' to 650', gypsum 30%. | | | |
| 650 | 660 | 10 | " | | No sample. | | | |
| 660 | 753 | 93 | 41 | | Shale, brown, soft, medium bedded to laminated; anhydrite as bands of fine [illegible] | | | Bedding dip: 10° to 36°, average 22°. |

# STAUFFER CHEMICAL COMPANY DRILL LOG



BEGUN _____ FINISHED _____ LOGGED BY _____ DRILLED BY _____ DRILL HOLE SSC-3

ELEV. _____ TOTAL DEPTH _____ LOCATION _____ ORE _____

| FOOTAGE FROM | TO | THICKNESS | RECOVERY | FORMATION | LITHOLOGY | ORE MINERALS | ASSAY | REMARKS |
|---|---|---|---|---|---|---|---|---|
| | | | | | sandy material, anhydrite about 5%. | | | |
| 753 | 772 | 19 | 17 | | Shale, brown, soft, medium bedded, in places sandy to silty; anhydrite as bands and laminations of fine grained massive material; from 759.0' to 760.1' is massive fine grained anhydrite. Yes? | | | Beddings dip: 20° to 35°, average 27°. |
| 772 | 843 | 71 | 40 | | Glauberite (?) Anhydrite, mostly massive, coarsely crystalline, in part euhedral crystals, very coarsely crystalline, probably includes some glauberite; grayish brown to brown shale as thin bands, partings, and laminations, and in part as a matrix for mesh of glauberite (?) or anhydrite (?) crystals. | | | |
| 843 | 863.5 | 20.5 | 18.7 | | Shale, brown to green, medium hard, thin bedded to laminated, with partings and thin beds of fine grained anhydrite, also considerable glauberite (?) as coarse euhedral crystals; glauberite (?) and anhydrite increasing from 15% to 80% at base. | | | Bedding dip: 25° to 38°, average 34°. |
| 863.5 | 873 | 9.5 | 8.0 | Muddy Creek | Glauberite (?), coarsely to very coarsely crystalline as a mesh of euhedral crystals with the interstices filled with shale, green to brown to light gray, medium hard. Halite occurs to minor extent in interstices; halite from 864.9' to 865.5' is a layer, transparent, very coarsely crystalline. | Halite | 10% NaCl | |

# STAUFFER CHEMICAL COMPANY DRILL LOG



BEGUN _____ FINISHED _____ LOGGED BY _____ DRILLED BY _____ DRILL HOLE SSC-3

ELEV. _____ TOTAL DEPTH _____ LOCATION _____ ORE _____

| FOOTAGE FROM | FOOTAGE TO | THICKNESS | RECOVERY | FORMATION | LITHOLOGY | ORE MINERALS | ASSAY | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 873 | 888 | 15 | 15 | | Halite, transparent, very coarsely crystalline with euhedral crystals of glauberite (?) minor shale, brown to light gray to green; halite increasing toward base. | | 50% NaCl | |
| 888 | 909 | 21 | 21 | | As above. | | 90%+ NaCl | |
| 909 | 933 | 24 | 24 | | Anhydrite (?), and glauberite (?), massive, fine grained, and as very coarse euhedral crystals with a matrix of halite, and greenish to brownish shale; massive anhydrite (?) as distinct bands. | | 20% NaCl | |
| 933 | 963 | 3.0 | 3.0 | | Halite, transparent, coarsely crystalline with some fragments of greenish shale. | | 90%+ NaCl | Dip 30°. |
| 963 | 987 | 24 | 24 | | Halite, transparent, very coarsely crystalline with anhydrite as scattered sparse euhedral crystals and as bands of same, associated with grayish green shale. | | 85% NaCl | |
| 987 | 1012 | 25 | 25 | | As above. | | 95% NaCl | |
| 1012 | 1023 | 11 | 0 | | No recovery. | | | |
| 1023 | 1032 | 9 | 9 | | As above. | | 70% NaCl | |
| 1032 | 1047 | 15 | 15 | | As above. | | 90%+ NaCl | |
| 1047 | 1052.5 | 5.5 | 5.5 | | As above. | | 70% NaCl | |

# STAUFFER CHEMICAL COMPANY DRILL LOG



BEGUN _____ FINISHED _____ LOGGED BY _____ DRILLED BY _____ DRILL HOLE SSC-3

ELEV. _____ TOTAL DEPTH _____ LOCATION _____ ORE _____

| FOOTAGE FROM | TO | THICKNESS | RECOVERY | FORMATION | LITHOLOGY | ORE MINERALS | ASSAY | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 1052.5 | 1053 | 0.5 | 0.5 | | Shale, gray green. | | 0% NaCl | Nil halite. |
| 1053 | 1059 | 6.0 | 6.0 | | Halite and shale as above. | | 80% NaCl | |
| 1059 | 1074 | 15 | 15 | | Halite and shale as above. | | 85%+ NaCl | |
| 1[illegible] | 1124 | 50 | 42.8 | | As above; zone of high shale and anhydrite (?), (less than 50% NaCl) at 1086.3 to 1087.3'. | | 90%+ NaCl | |
| 1124 | 1128 | 4 | 4 | | As above; .5' silty grayish green shale at 1126'. | | 80%+ NaCl | |
| 1128 | 1263 | 135 | 121 | | As above. | | 90%+ NaCl | |
| 1263 | 1280 | 20 | Cuttings | Muddy Creek | Halite, 60%; shale, light greenish gray to reddish brown, 40%. | | | |
| 1280 | 1300 | 20 | " | | As above, halite 80% to 85%. | | | All samples have considerable shale as large fragments, probably sloughing from up the hole. |
| 1[illegible] | 1320 | 20 | " | | As above. | | | |
| 1320 | 1340 | 20 | " | | As above. | | | |
| 1340 | 1360 | 20 | " | | As above. | | | |
| 1360 | 1380 | 20 | " | | As above. | | | |
| 1380 | 1400 | 20 | " | | As above. | | | |
| 1400 | 1420 | 20 | " | | As above. | | | |
| 1420 | 1430 | 10 | " | | No sample. | | | |

# STAUFFER CHEMICAL COMPANY DRILL LOG



BEGUN _____ FINISHED _____ LOGGED BY _____ DRILLED BY _____ DRILL HOLE SSC-3

ELEV _____ TOTAL DEPTH _____ LOCATION _____ ORE _____

| FOOTAGE FROM | FOOTAGE TO | THICKNESS | RECOVERY | FORMATION | LITHOLOGY | ORE MINERALS | ASSAY | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 1430 | 1459 | 29 | Cuttings | | Halite, transparent, coarsely to very coarsely crystalline, granular in places with sparse glauberite (?) as euhedral crystals, some reddish brown silty shale as thin bands. | | 90%+ NaCl | |
| [illegible]9 | 1480 | 21 | " | | Halite 35%; light greenish gray to light reddish brown shale 65%. | | | Shale in part is sloug |
| 1480 | 1500 | 20 | " | | As above, halite 85% to 90%. | | | |
| 1500 | 1520 | 20 | " | | As above, halite 85% to 90%. | | | |
| 1520 | 1540 | 20 | " | | As above, halite 85% to 90%. | | | |
| 1540 | 1560 | 20 | " | | As above, halite 85% to 90%. | | | |
| 1560 | 1580 | 20 | " | | Halite 60% to 70%; shale 30% to 40%. | | | |
| [illegible]80 | 1600 | 20 | " | | Halite 85% to 90%. | | | |
| 1600 | 1614 | 14 | " | | No sample. | | | |
| 1614 | 1616 | 2 | 2 | | Anhydrite (?), massive with some shale, greenish gray, and halite. | | 20% NaCl | |
| 1616 | 1629.4 | 13.4 | 13.4 | | Halite, transparent, very coarsely crystalline with scattered bands of massive anhydrite. | | 85%+ NaCl | |
| 1629.4 | 1636 | 6.6 | 6.6 | | As above. | | 70% NaCl | |
| 1636 | 1644 | 8 | 8 | | No recovery. | | | |

# STAUFFER CHEMICAL COMPANY DRILL LOG



BEGUN _____ FINISHED _____ LOGGED BY _____ DRILLED BY _____ DRILL HOLE 880-3

ELEV _____ TOTAL DEPTH _____ LOCATION _____ ORE _____

| FOOTAGE FROM | TO | THICKNESS | RECOVERY | FORMATION | LITHOLOGY | ORE MINERALS | ASSAY | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 1644 | 1680 | 36 | Cuttings | | Shale, greenish gray to brown with 10% halite and anhydrite and glauberite (?). | | | |
| 1680 | 1800 | 120 | " | | As above, halite and glauberite (?) anhydrite, 30% to 40%. | | | |
| 1800 | 1830 | 30 | 13.0 | | Interbedded anhydrite, massive, in part coarse euhedral crystals of glauberite,(?) and shale, medium hard, brown. | | 0% NaCl | |
| 1830 | 1910 | 80 | Cuttings | | Shale, green to light gray to light reddish brown; halite 30% to 40%; the two materials are interbedded with halite to 10' in thickness | | | |
| 1910 | 1924 | 14 | " | | Not recorded, probably same as 1830' to 1910'. | | | |
| 24 | 1933.5 | 9.5 | 9.5 | | Anhydrite and glauberite (?), mostly massive, in part euhedral crystals with sparse shale, brown, medium hard as bands and matrix; .3' black carbonaceous shale at 1927'; halite as scattered matrix with anhydrite (?) crystals. | | 10% Halite | |
| 1933.5 | 1939 | 5.5 | 5.5 | | Halite, transparent, very coarsely crystalline with scattered crystals of glauberite (?), and anhydrite and bands and partings of shale, brown, medium hard. | | 70% NaCl | |

# STAUFFER CHEMICAL COMPANY DRILL LOG



BEGUN _____ FINISHED _____ LOGGED BY _____ DRILLED BY _____ DRILL HOLE SSC-3

ELEV. _____ TOTAL DEPTH _____ LOCATION _____ ORE _____

| FOOTAGE FROM | FOOTAGE TO | THICKNESS | RECOVERY | FORMATION | LITHOLOGY | ORE MINERALS | ASSAY | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 1939 | 1953 | 14 | 13.5 | | Anhydrite (?), massive, with sparse bands and partings of shale, gray, medium hard. | | | |
| 1953 | 2000 | 47 | Cuttings | Muddy Creek | Shale, light greenish gray to green to light reddish brown with 10% anhydrite. | | | |
| 2000 | 2010 | 10 | " | | As above; anhydrite and gypsum, 25% to 30%. | | | |
| 2010 | 2030 | 20 | " | | As above; with halite, 60%. | | | |
| 2030 | 2070 | 40 | " | | Shale, mostly green to light grayish green with some light reddish brown; anhydrite and gypsum, 10% to 20%. | | | |
| 2070 | 2180 | 110 | " | | Shale, dark reddish brown with 5% to 10% anhydrite. | | | Shale very soft. |
| 2180 | 2230 | 50 | " | | As above, with anhydrite increasing toward base to 40%. | | | Total depth 2230'. |

# STAUFFER CHEMICAL COMPANY DRILL LOG

BEGUN 8/29/62 FINISHED 9/14/62 LOGGED BY L.E.M. DRILLED BY Boyles Brothers Drilling Co. DRILL HOLE SSC-4

ELEV. G.L. 1379 DEPTH 1338 LOCATION 3828'North & 823' East of SW Cor.Sec.33.T.17S.R.68E MDM 338' salt PAGE 1

| FOOTAGE FROM | FOOTAGE TO | THICKNESS | RECOVERY | FORMATION | LITHOLOGY | MINERALS | ASSAY | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 0 | 60 | 60 | None | Muddy Crk. | No sample | | | |
| 60 | 120 | | | " " | Clay shale and clayey siltstone, light brown, soft, disintegrates in water quite rapidly after drying. | | | Samples taken at intervals shown |
| 140 | | | | " " | Clay shale and clayey siltstone light brown 70%; gray brown 30% | | | Two days lost by pump trouble 8/29 a 8/30. |
| 162 | | | | " " | Clay shale, light brown, 40%; sandstone, very light gray, 30%; clay shale, gray, soft 30%. | | | All samples after drying disintegrate readily in water. |
| 182 | | | | " " | Clay shale, light brown 80%; clay shale, gray 20%; trace fine gypsum (?). | | | |
| 185 | | | | " " | Clay shale, light brown, 60%; gypsum, buff, fine grained, firm, 40% | | | (Check for composit of gypsum) |
| 200 | | | | " " | Clay shale, gray, 40%; gypsum, fine grained, buff, firm, with caused selenite 60%. | | | |
| 210 | | | | " " | Clay shale, light brown 10%; clay shale, gray 20%; gypsum selenitic, white to colorless, 70%. | | | |
| 220 | | | | " " | Clay shale, light, to slightly reddish brown, soft, 70%; siltstone, light brown 10%;gypsum, selenitic, 20%. | | | |
| 240 | | | | " " | Clay shale, light brown, soft disintegrates readily in water, 80%; gypsum, buff, fine grained, firm, may be in part tuffaceous, 20%. | | | |
| 260 | | | | " " | Clay shale, light brown, trace fine grained gypsum. | | | |
| 280 | | | | " " | Clay shale and silty clay shale, very light to light brown, silty particles do not disintegrate as readily as clay shale | | | |

# STAUFFER CHEMICAL COMPANY DRILL LOG

BEGUN 8/29/62 FINISHED 9/14/62 LOGGED BY L.E.M. DRILLED BY Boyles Brothers Drilling Co. DRILL HOLE SSC-4 338' salt

ELEV. G.L. 1379 DEPTH 1338 LOCATION 3828'North & 823'East of SW Cor.Sec.33.T.17S.R.68E MDM PAGE 2

| FOOTAGE FROM | FOOTAGE TO | THICKNESS | RECOVERY | FORMATION | LITHOLOGY | MINERALS | ASSAY | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 300 | | | | Muddy Crk. | Silty clay shale, light gray to light brownish gray 60%; clay shale, light brown 20%; gypsum selenitic and fibrous, 20%; | | | Disintegration observed after sample are dried. Damp samples do not disintegrate noticeabl in water. |
| 20 | | | | " " | Clay shale, light brown and very light brown; 50-50%; the very light brown is softer and disintegrates more readily in water; trace fine gypsum. | | | |
| 340 | | | | " " | Clay shale, light brown, does not disintergate, 90%; clay shale, brownish gray, 10%. Trace fine gypsum. | | | |
| 360 | | | | " " | Clay shale, light brown 30%; brownish gray 50%; both soft and disintegrate readily in water, the light brown more readily; gypsum selenitic 20%. | | | |
| 30 | 420 | | | " " | Same but proportions 70%; 25%; 5%. | | | |
| 440 | | | | | Same, but proportions 50%, 45%; 5%. | | | |
| 460 | | | | " " | Clay shale, light brown 40%; gray brown and brownish gray 50%; tuff, gray, locally greenish, fine grained, very finely speckled with black, soft, 10%; Both shales, soft, disintegrate readily in water. | | | Is equivalent to 440-460 in SSC-3(?) |
| 480 | | | | " " | Clay shale, light brown 40%; gray and brownish gray 60%; light brown more readily disintegrates; trace gypsum selenitic. | | | |
| 500 | | | | " " | Clay shale, light brown 30%; gray and brownish gray 70%; trace selenitic, gypsum. | | | |

# STAUFFER CHEMICAL COMPANY DRILL LOG

BEGUN _____ FINISHED _____ LOGGED BY L.E.M. DRILLED BY Boyles Brothers Drilling Co. DRILL HOLE SSC-4

ELEV. G.L. _____ DEPTH _____ LOCATION _____ PAGE 3

| FOOTAGE FROM | FOOTAGE TO | THICKNESS | RECOVERY | FORMATION | LITHOLOGY | MINERALS | ASSAY | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 520 | | | | | Clay shale; light brown, 30%; gray brown to gray 70%. | | | |
| 540 | | | | | Clay shale, light brown 20%; gray brown to light gray, 80%. | | | |
| 560 | 580 | | | | Clay shale, light brown 10%; light gray to brownish gray 90%; trace blue gray clay shale and selenitic gypsum. | | | |
| 600 | | | | | Clay shale, tan to gray brown to light brown, 90%; blue gray 10%; trace selenitic gypsum. | | | |
| 620 | | | | | Clay shale, brown, locally grayish, and greenish brown, 85%; light brown 10%; selenitic gypsum 5%. | | | |
| 640 | | | | | Sample lost. | | | |
| 660 | 730 | | | | Clay shale, mostly grayish brown to brown; trace selenitic gypsum; trace light brown shale. | | | |
| 740 | | | | | Clay shale, brown to gray brown 70%; light brown 30%. | | | |
| [illegible]0 | | | | | Clay shale, light brown 60%; gray brown 40%. | | | |
| 760 | | | | | Clay shale, light brown 50%; gray brown 50%; trace selenitic gypsum. | | | |
| 770 | | | | | Same but 60%-40%; trace gypsum. | | | Samples are here about 10' behind (shallower) than footage indicated. |
| 780 | | | | | Clay shale, brownish gray to gray brown, trace gypsum. | | | |
| 790 | | | | | Clay shale, gray brown 80%; light brown 20%; trace selenitic. | | | |
| 800 | 810 | | | | Clay shale, gray brown to brownish gray 70%; light brown 30%; trace selenite. | | | |
| 820 | | | | | Clay shale, gray brown to brown 90%; light brown 10%; trace gray; trace selenite; bare, trace partly dissolved glauberite(?) | | | Topmost glauberite( |

# STAUFFER CHEMICAL COMPANY DRILL LOG

BEGUN _____ FINISHED _____ LOGGED BY L.E.M. DRILLED BY Boyles Brothers Drilling Co. DRILL HOLE SSC-4

ELEV. G.L. _____ DEPTH _____ LOCATION _____ PAGE 4

| FOOTAGE FROM | TO | THICKNESS | RECOVERY | FORMATION | LITHOLOGY | MINERALS | ASSAY | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 830 | | | | | Clay shale, brown to gray brown 80%; light brown 20%; 1% white soft particles of partly dissolved glauberite. | | | |
| 840 | | | | | Clay shale, brownish gray to gray brown and brown 80%; light brown 20%, trace selenite; trace disseminated. glauberite (?) | | | |
| 850 | 860 | | | | Clay shale, brown to gray brown to greenish brown, 95%; gypsum after glauberited (?) 5%; trace selenite. | | | Glauberite dissolves partially leaving a calcium sulfate residue. |
| 870 | | | | | Clay shale, same 90%; gypsum after glauberite 10%. | Efflorescence | | Washed cuttings " " |
| 880 | | | | | Same but 95%-5% | | | " " |
| 90 | | | | | Same but 90-10% | | | " " |
| 900 | | | | | Same but 80-20% | | | " " |
| 910 | | | | | Clay shale, brownish gray 70%. light brown 10%; gypsum after glauberite 20%. | | | |
| 920 | 940 | | | | Clay shale, brownish gray to gray brown 70%; light brown 5%; greenish gray trace to 5%; gypsum after glauberite 20%. | | | |

# STAUFFER CHEMICAL COMPANY DRILL LOG

BEGUN _____ FINISHED _____ LOGGED BY L.E.M. DRILLED BY Boyles Brothers Drilling Co. DRILL HOLE SSC-4

ELEV. G.L. _____ DEPTH _____ LOCATION _____ PAGE 5

| FOOTAGE FROM | FOOTAGE TO | THICKNESS | RECOVERY | FORMATION | LITHOLOGY | MINERALS | ASSAY ESTIM. | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 950 | 960 | | | | Clay shale, gray brown 95% trace greenish brown; gypsum after glauberite 5%. | | | Samples are about 1 behind (shallower) than footage indica |
| 970 | 980 | | | | Clay shale, gray brown to brown 85%; light brown 10%; gypsum after glauberite 5%. | | | All samples show efflorescence even though they were washed. |
| 990 | | | | | Same but gypsum after glauberite 10%. | | | |
| 1000 | | | | | Clay shale gray brown to brown 90%; light brown 5%; gypsum after glauberite 5%; trace light greenish gray shale. | | | Small amount of cuttings in return 1000-1020. Salt probably first encountered in quantity at about 1000 feet. |
| 10 | | | | | Clay shale, gray brown 80%; gypsum after glauberite 20%; trace light greenish gray shale. | | | |
| 1020 | | | | | Same but w/5% light brown shale | | | |
| 1022 # 1 | 1028 | 6 | 6 | Muddy Crk. | Chiefly glauberite, glassy, fine to very coarse (up to 1" long) crystals, generally massive appearing with some bedding noticeable, 70%; light greenish gray silt or clay (?) interstitial to glauberite; halite, medium crystalline, gray 20%. | Halite Glaub. | 20%NaCl | 30° dip @ 1028' |

# STAUFFER CHEMICAL COMPANY DRILL LOG

BEGUN _____ FINISHED _____ LOGGED BY L.E.M. DRILLED BY Boyles Brothers Drilling Co. DRILL HOLE SSC-4

ELEV. G.L. _____ DEPTH _____ LOCATION _____ PAGE 6

| FOOTAGE FROM | TO | THICKNESS | RECOVERY | FORMATION | LITHOLOGY | MINERALS | ASSAY ESTIM. | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 1028 # 1 | 1032 | 4 | 4 | Muddy Crk | Halite, gray to colorless, medium coarse 65%; glauberite, medium to coarse, dispersed and irregular patches in halite. | | 65%NaCl | |
| 1032 # 2 | 1040 | 8 | 8 | " " | Halite, colorless to gray, medium to medium coarse grained, 90%; glauberite, fine to coarse, as irregularly distributed crystals and patches, local greenish gray clay or silt interstitial to glauberite 10%. | | 90%NaCl | Halite is strongly shattered and crush but healed solid. |
| 1040 # | 1052 2 & 3 | 12 | 11 | " " | Halite, colorless, medium coarse to coarse 95%; sparse scattered glauberite. | | 95%+NaCl | " " |
| 1052 # | 1062 4 | 10 | 1 | " " | Halite, colorless, 80%, gray brown saliterous clay lower 2"; sparse glauberite. | | 80%? | Halite Run is probably good salt; immediately above and below is good sal Core is washed. |
| 62 # | 1065 5 | 3 | 3 | " " | Halite, clear, cut by numerous fractures perpendicular to core axis, 95%; sparse glauberite toward bottom. | | 95% H. | |
| 1065 | 1072 | 7 | 2/1/2 | | Halite, gray, 50%; glauberite and light greenish gray clay in fine mixture, rather soft, irregular patches 40%. | | 60% H | Core lost, washed badly |
| 1072 | 1081 | 9 | 1 | | Halite clear, 85%; glauberite and clay as above in upper 3". | | 85% H. | |

# STAUFFER CHEMICAL COMPANY DRILL LOG

BEGUN _____ FINISHED _____ LOGGED BY L.E.M. DRILLED BY Boyles Brothers Drilling Co. DRILL HOLE SSC-4

ELEV. G.L. _____ DEPTH _____ LOCATION _____ PAGE 7

| FOOTAGE FROM | FOOTAGE TO | THICKNESS | RECOVERY | FORMATION | LITHOLOGY | MINERALS | ASSAY ESTIM. | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 1081 | 1085 | 4 | 4 | | Halite, greenish to brownish gray, dark, with much included clayey material; some fine glauberite, considerable shattering noticeable. | | 80% H. | |
| 1085 | 1091 | 6 | 6 | | Halite, colorless to gray, strongly shattered 97%; nil glauberite; clay and silt 3%. | | 97% H. | Strongly shattered |
| 1091 | 1102 | 11 | 2-1/2 | | Halite, 90% in upper 1-1/2', 50% in lower 1' which is much washed and broken; lower 1' contains 50% glauberite and mixed silt and glauberite. | | 80% H. | |
| 1102 | 1108 | 6 | 1 | | Halite, colorless to light gray, sparse glauberite crystals. | | 90% H. | Core washed and los |
| 1108 | 1118 | 10 | 10 | | Halite, brownish, locally colorless, 85-90%; considerable blebs and intergranular films of silt and clay, brown; sparse, fine glauberite. | | | Shattered locally |
| 1118 | 1126.25 | 8.25 | 8.25 | | Halite, gray brown to locally colorless, disseminated and blebby brown silt; sparse scattered glauberite crystals and fine glauberite in clay. | | 95% H. | Somewhat shattered |
| 1126.25 | 1133 | 6.75 | 7.25 | | Halite, colorless to gray 85%, impure with irregularly distributed glauberite crystals and fine grained, irregular stringers of glauberite. | | 85% H. | Dip 25-30'<br>Locally shattered |

# STAUFFER CHEMICAL COMPANY DRILL LOG

BEGUN _____ FINISHED _____ LOGGED BY L.E.M. DRILLED BY Boyles Brothers Drilling Co. DRILL HOLE SSC-4

ELEV. G.L. _____ DEPTH _____ LOCATION _____ PAGE 8

| FOOTAGE FROM | FOOTAGE TO | THICKNESS | RECOVERY | FORMATION | LITHOLOGY | MINERALS | ASSAY ESTIM. | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 1133 | 1140.25 | 7.25 | 7.25 | | Halite, brownish 87.90%; disseminated and blebby brown siltstone & clay; sparse glauberite crystals, some disseminated in clay blebs; Lower 1.25' 80% glauberite, medium to fine crystalline with interstitial gray green clay. | | 87% H. | Shattered |
| 1140.25 | 1146.75 | 5.5 | 5.5 | | Halite, clear to gray, 95%+; trace glauberite and silt. | | 95% H. | Shattered |
| 1145.75 | 1148.5 | 2.75 | 2.75 | | Halite, brownish, containing sparse glauberite and some silt and clay, brown as blebs and interstitial films. | | 85-90%H | |
| 1148.5 | 1151.5 | 3 | 3 | | Glauberite, fine to coarse; abundant irregular masses 60%; halite clear to gray 40%. | | 40% H. | Dip 45° @ 1151 |
| 1151.5 | 1167.25 | 15.75 | 15.75 | | Halite, brownish to gray, shattered 90%, local silty glauberitic zones; Glauberite less than 3%. | | 90% H. | |
| 1167.75 | 1170 | 2.25 | 2.25 | | Halite, gray brown 70%; glauberite, medium grained, locally silty 30%. | | 70% H. | Dip 35-40° |
| 1170 | 1188 | 18 | 18 | | Halite, clear to gray brown, locally somewhat impure 90%; very sparse glauberite | | 95%+H | |
| 1188 | 1198 | 10 | 10 | | Halite like above but with muddy spots; very sparse glauberite except in bottom 2' where 15% glauberite is present. | | 90%H | |

# STAUFFER CHEMICAL COMPANY DRILL LOG

BEGUN _____ FINISHED _____ LOGGED BY L.E.M. DRILLED BY Boyles Brothers Drilling Co. DRILL HOLE SSC-4

ELEV. G.L. _____ DEPTH _____ LOCATION _____ PAGE 9

| FOOTAGE FROM | FOOTAGE TO | THICKNESS | RECOVERY | FORMATION | LITHOLOGY | MINERALS | ASSAY ESTIM. | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 1198 | 1212.75 | 14.75 | 14.75 | | Halite, gray, to brownish and locally colorless, 93%, sparse glauberite 2-3%. | | 93% H. | |
| 1212.75 | 1221 | 9.75 | 8.75 | | Halite, grayish to brownish, 80-85%; glauberite, fine to medium fine as very irregular masses, blebs and stringers 15%; minor clay with glauberite. | | 80% H. | |
| 1221 | 1223 | 2 | 2 | | Tuff, very light gray, in middle is bedded, upper and lower parts are disturbed and intruded by halite, lower foot is 50% halite. | | 35% H. | |
| 1223 | 1228 | 5 | 5 | | Halite, brownish to light grayish 90% +; local muddy, fine glauberite. | | 90%+H. | |
| 1228 | 1230 | 2 | 2 | | Halite, gray to brown, 75%; glauberite, fine and medium coarse, irregularly distributed, locally muddy; 2" muddy glauberite at 1229', 15-20% glauberite. | | 75% H. | |
| 1230 | 1259.25 | 29.25 | 29.25 | | Halite, gray to brown 90%+, irregularly distributed blebs, masses, and films of silt, shale, and silty glauberite, local sparse glauberite crystals; glauberite 3%. | | 90%+H. | Locally highly shat |
| 1259.25 | 1261.75 | 2.5 | 2.5 | | Halite, brown, 70%; glauberite, irregularly distributed, medium fine to coarse glauberite crystals, 20% some silt. | | 70% H. | |

# STAUFFER CHEMICAL COMPANY DRILL LOG

BEGUN _____ FINISHED _____ LOGGED BY L.E.M. DRILLED BY Boyles Brothers Drilling Co. DRILL HOLE SSC-4

ELEV. G.L. _____ DEPTH _____ LOCATION _____ PAGE 10

| FOOTAGE FROM | FOOTAGE TO | THICKNESS | RECOVERY | FORMATION | LITHOLOGY | MINERALS | ASSAY ESTIM. | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 1261.75 | 1262.85 | 1.1 | 1.1 | | Glauberite, coarse, massive, very muddy in lower 2", 90%; halite 10% | | 10% H. | |
| 1262.85 | 1268. | 5.15 | 5.15 | | Halite, clear to brownish to gray & somewhat muddy in upper 2', 90%; nil glauberite. | | 90% H. | |
| 68 | 1271 | 3 | 3 | | Halite, brownish, 85%; glauberite, coarse, scattered crystals 8%. | | 85% H. | |
| 1271 | 1296.6 | 25.5 | 25.5 | | Halite, brownish, locally shattered, local gray, 90%; scattered patches of medium to medium coarse glauberite crystals, 2-3%. | | 90% H. | |
| 1296.6 | 1297.5 | 1.1 | 1.1 | | Silt, probably tuffaceous, brown, saline. | | 10% H. | |
| 1297.5 | 1302.5 | 5 | 5 | | Halite, gray brownish, 90%. | | 90% H. | |
| 02.5 | 1308.25 | 5.75 | 5.75 | | Halite, clear to gray brown; pure and very muddy halite intermixed, probably average 85% halite. | | 85% H. | |
| 1308.25 | 1316.5 | 8.25 | 8.25 | | Halite, brown, silty and clayey, locally colorless, 85-90%. | | 85% H. | |
| 1316.5 | 1320.25 | 3.75 | 3.75 | | Halite, brownish to grayish 80%, patches and masses of glauberite, medium fine to medium coarse, 20%. | | 80% H. | |
| 1320.25 | 1325.75 | 5.5 | 5.5 | | Halite, gray brown 85-90%, irregular patches of medium grained glauberite, also patches of silty fine grained glauberite, brown. | | 85% H -90% H. | |

# STAUFFER CHEMICAL COMPANY DRILL LOG

BEGUN _____ FINISHED _____ LOGGED BY L.E.M. DRILLED BY Boyles Brothers Drilling Co. DRILL HOLE SSC-4

ELEV. G.L. _____ DEPTH _____ LOCATION _____ PAGE 11

| FOOTAGE FROM | FOOTAGE TO | THICKNESS | RECOVERY | FORMATION | LITHOLOGY | MINERALS | ASSAY ESTIM. | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 1325.75 | 1327 | 1.25 | 1.25 | | Tuff, light gray, slightly, greenish, soft. | | | |
| 1327 | 1336½ | 9½ | 9½ | | Halite, gray to gray brown, 85-90%, irregular patches & scattered crystals of fine to medium fine glauberite, commonly silty. | | 85-90% | H. |
| 1336½ | 1337.5 | 0.75 | 0.75 | | Silt, glauberitic, saline, brown. | | | Core ground up. |
| 1337.5 | 1338 | 0.5 | 0.5 | | Halite, gray brown, silty | | 80% | Total Depth 1338 feet. |

PROJECT Goldfield-Detrital Valley

PHELPS DODGE CORPORATION
GEOPHYSICAL RESEARCH & EXPLORATION DEPT.

HOLE NO. 1

COORDINATES 330 S, 815 E from NW Cor. Sec 13

COLLAR ELEVATION 1645.5

TYPE DRILL Porta Drill/ Joy Diamond BIT SIZE 4-3/4" Tri Cone 2-15/16" NX Diamond

# GEOLOGIC LOG

TOTAL FOOTAGE 696½

DATE STARTED February 18, 1959 Scale 1" = 100'

DATE COMPLETED March 5, 1959

LOGGED BY A. R. Smith

13 T. 30N. - R. 21 W.

| From | To | ~~Core Recovery~~ Thickness | Rock Type | Description | ~~Alteration~~ | ~~Metallization~~ | Graphic Log Depth | Lith. | Dip |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 19 | 19 | Alluv. Gravel | Granitic alluvial-boulder-cobble size, unconsolidated gravel | | | | | |
| 19 | 48 | 29 | Red Clay | Clay-Red-brown, unconsolidated; local sandy lenses | | | | | |
| 48 | 91 | 43 | Claystone | Claystone-green-gray, weakly indurated; a few gypsum seams | | | | | |
| 91 | 295 | 204 | Clay & Siltstone | Clay-Dark brownish-gray, unconsolidated; interbedded with minor amounts of gray siltstone | | | 100<br>200 | | |
| 295 | 418 | 123 | Claystone & Gypsum | Claystone-Dark grayish-brown, weakly indurated; interbedded with subordinate amounts of a light-brown claystone, and gypsum lenses that are quite numerous below 376' | | | 300<br>400 | | |
| 418 | 460 | 42 | Anhydrite & Claystone | Interbedded anhydrite, gypsum, claystone | | | | | |
| 460 | 561 | 101 | Siltstone, Gypsum, Anhydrite | Siltstone-Light brown, moderately indurated; locally lenses of anhydrite, gypsum, and volcanic ash | | (Began NX-wire line at 541' | 500<br>541 | | 5-13° |

# SUMMARY GEOLOGIC LOG

Hole No. 1 Detrital Valley

Sheet No. 2

| From | To | ~~Core Recovery~~ Thickness | Rock Type | Description | ~~Alteration~~ | ~~Mineralization~~ | Depth | Lith. | Graphic Log Dip |
|---|---|---|---|---|---|---|---|---|---|
| ~~561~~ | ~~570~~ | ~~9~~ | ~~Anhydrite~~ | ~~Anhydrite-massive, gray to brownish with 20-40% silt & clay~~ | | | | | |
| 570 | 609 | 39 | Silty Clay-stone | Claystone-Light brown, silty; interbedded with anhydrite & gypsum | | | 600 | | 3°-12° |
| 609 | 662½ | 53.5 | Anhydrite, gypsum, silt-stone | Anhydrite and gypsum (60-75%) by volume interbedded with silty claystone; massive anhydrite zones range to 6' | | | | | 10°-15° |
| 662½ | 696½ | 34 | Diorite | Diorite; upper 10' broken and altered | | | 700 | | |

**Bottom Hole 696½**

Set 538' of 3" pipe
4-3/4" Tri-Cone bit from 0' to 541'
NX-wireline from 541' to 696½'
89% core recovery

PROJECT Goldfield-Detrital Valley

PHELPS DODGE CORPORATION
GEOPHYSICAL RESEARCH & EXPLORATION DEPT.

HOLE NO. 2

COORDINATES 1390S & 720E from NW Cor.Sec.13

COLLAR ELEVATION 1641.6

# GEOLOGIC LOG

TYPE DRILL Portadrill BIT SIZE 4-3/4" TriCone

TOTAL FOOTAGE 751

DATE STARTED March 6, 1959

Scale 1" = 100'

DATE COMPLETED March 17, 1959

LOGGED BY A. R. Smith

| From | To | ~~Core Recovery~~ Thickness | Rock Type | Description | ~~Alteration~~ | ~~Mineralization~~ | Graphic Log Depth | Lith. | Dip |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 12 | 12 | Alluv.Gravel | Alluvial gravel-composed mainly of granitic cobbles in a sandy, unconsol. matrix | | | | | |
| 12 | 132 | 120 | Red Clay | Clay-Red-brown, unconsolidated with a minor amount of coarse sand and gravel lenses<br>88'-95' A distinctive gravel layer, composed of very coarse sand and pebbles | | | 100 | | |
| 132 | 245 | 113 | Brown Clay | Clay-Dark brownish-gray, unconsolidated; alternating with red brown unconsol. clay layers, and coarse sand lenses. | | | 200 | | |
| 245 | 400 | | Claystone and Clay | Claystone-Red brown & dark brownish-gray claystone, weakly indurated interbedded with a minor amount of gray siltstone and unconsolidated clay lenses<br>>2% of interlayered gypsum seams below 300' | | | 300<br>400 | | |
| 400 | 435 | 35 | Claystone & Gypsum | Claystone-Dark brownish-gray, weakly indurated, interbedded with a minor amount of gypsum lenses (1-3%) | | | | | |
| 435 | 490 | 55 | Anhydrite & Gypsum | 45-70% Gypsum and anhydrite; interbedded with volcanic ash (462'-465') and minor claystone | | | | | |
| 490 | | 150 | Claystone | Claystone-Light-red brown, weakly indurated alternating with dark brownish-gray claystone; subordinate amounts of anhydrite and gypsum | | | 500<br>580 | | |

# SUMMARY GEOLOGIC LOG

Sheet No. 2

Hole No. 2

Scale 1" = 100'

| From | To | Core Recovery Thickness | Rock Type | Description | Alteration | Metallization | Depth | Lith. | Graphic Log | Dip |
|---|---|---|---|---|---|---|---|---|---|---|
| | 640 | | (continued) Claystone | | | | 600 | | | |
| 640 | 653 | 13 | Anhydrite | Anhydrite & gypsum; minor amount of interbedded claystone | | | | | | |
| 653 | 733 | 80 | Claystone, Anhydrite, Gypsum | Claystone-Brownish gray and light reddish brown interbedded with 10-20% gypsum and anhydrite | | | 700 | | | |
| 733 | 751 | 18 | Diorite | Diorite fractured and broken at the upper contact | | | | | | |

Bottom of hole 751'

4-3/4" Tri Cone bit 0' - 751'

01007

PROJECT Goldfield-Detrital Valley

PHELPS DODGE CORPORATION
GEOPHYSICAL RESEARCH & EXPLORATION DEPT.

HOLE NO. 3

COORDINATES 3740 N & 4000 E from SW Cor. Sec. 12

# GEOLOGIC LOG

COLLAR ELEVATION 1516.1

TYPE DRILL Portadrill BIT SIZE 4-3/4"

TOTAL FOOTAGE 185'

DATE STARTED March 18, 1959

Scale 1" = 50'

DATE COMPLETED March 21, 1959

LOGGED BY A. R. Smith

| From | To | ~~Core Recovery~~ Thickness | Rock Type | Description | ~~Alteration~~ | ~~Mineralization~~ | Graphic Log Depth | Lith. | Dip |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 10 | 10 | Alluvium | Gravel alluvium-Granitic composition; pebble to boulder size, unconsol. | | | | | |
| 10 | 45 | 35 | Red Clay | Clay-Unconsolidated, red-brown, minor gravel & sand lenses | | | 45 | | |
| 45 | 55 | 10 | Sandstone | Sandstone-Brownish-gray, moderately indurated, v. fn. grain | | | | | |
| 55 | 165 | 115 | Clay & Gravel | (Water return became weak from 55'-72'. Lost circulation at 72') Interbedded gravel lenses and red-brown unconsol. clay | | | 90 135 | | |
| 165 | 185 | 20 | Claystone | Claystone-Assumed from the mat'l on the bit & slower rate of penetration | | | 180 | | |
| | | | | Bottom of Hole 185' | | | | | |

PROJECT Goldfield

COORDINATES 3190N & 4110E of SW Cor. Sec. 12

TYPE DRILL Porta Drill Joy ZZ Diamond BIT SIZE 4-3/4" NX wire-line

DATE STARTED March 21, 1959

PHELPS DODGE CORPORATION
GEOPHYSICAL RESEARCH & EXPLORATION DEPT.

# GEOLOGIC LOG

Scale 1" = 100'

HOLE NO. Goldfield No. 4

COLLAR ELEVATION 1518.3

TOTAL FOOTAGE 766

DATE COMPLETED April 18, 1959

LOGGED BY A. R. Smith

| From | To | ~~Core Recovery~~ Thickness | Rock Type | Description | ~~Alteration~~ | ~~Metallization~~ | Graphic Log Depth | Lith. | Dip |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 33 | 33 | Alluvial | Recent alluvium-granitic, mainly pebble size, unconsolidated | | | | | |
| 33 | 45 | 12 | Red Clay | Clay-Red brown, unconsolidated | | | | | |
| 45 | 60 | 15 | Sandstone | Sandstone-Brown, v. fn. grained, moderately indurated | | | | | |
| 60 | 160 | 100 | Clay & Gravel | Gravel and very coarse sand beds, interbedded with red brown unconsolidated clay | | | 100 | | |
| 160 | 352 | 192 | Gypsum and Claystone | Gypsum lenses in silty, light brown claystone. Massive gypsum lenses occur locally, which range between 10' and 30' in thickness. | | Began NX-wireline 260' | 200, 260, 300 | | 10° |
| 352 | 415 | 63 | Gypsum, Anhydrite | Gypsum, anhydrite, and brown claystone | | | 400 | | |
| 415 | 431 | 16 | Anhydrite | Anhydrite - massive | | | | | 5° |
| 431 | 504 | 73 | Siltstone, Anhydrite, Gypsum | Siltstone & claystone-brown, moderately indurated; lensed with anhydrite and gypsum; 459-469' 10' of massive anhydrite | | | 500 | | 5°-13° |
| 50- | 570 | 66 | Anhydrite | Anhydrite-massive to locally fragmental, grade ranges between 50%-80% v. minor gypsum; locally 1" to 2" clay zones | | | | | 10° 5° |

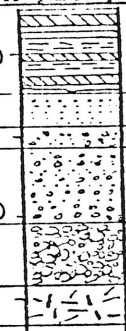
# GEOLOGIC LOG

Hole No. 4

Sheet No. 2

| From | To | ~~Core Recovery~~ Thickness | Rock Type | Description | ~~Alteration~~ | ~~Metallization~~ | Depth | Lith. | Dip |
|---|---|---|---|---|---|---|---|---|---|
| 570 | 622 | 52 | Gypsum, Anhydrite | Anhydrite, gypsum, mud, silt and claystone | | | 600 | | |
| 622 | 642 | 20 | Siltstone | Siltstone-Brownish-gray, progressively more clastic w/depth | | | | | 5°-10° |
| 642 | 656 | 24 | Sandstone | Pebbly sandstone 10 to 20% granitic pebbles | | | | | |
| 656 | 704 | 68 | Conglomerate | Conglomerate-Pebble to cobble size, granitic, sandy matrix | | | 700 | | |
| 704 | 742 | 38 | Boulder Conglomerate | Varied igneous boulders and breccia; strongly weathered. | | | | | |
| 742 | 766 | 24 | Monzonite | Coarse grained monzonite | | | | | |

Graphic Log



Bottom of Hole 766'
No circulation from 58' to 215'
Set 260' of 3" pipe

NX wire line 260'-325'
413'-766'

2-15/16" Tri Cone rock bit 325'-413'

83% core recovery 260'-704'
52% core recovery 704'-766'

# DRILL LOG

## GOLDFIELD, DETRITAL VALLEY SALINE - HOLE NO. 11

Location: NE¼, SE¼ Section 16, Township 29N., Range 21W., Gila and Salt River Meridian

Elevation: ±2030 Feet

Inclination: Vertical Depth: 890 Feet

Type of Drill: Boyles - Joy 22 Diamond Drill

Date Started: December 11, 1958 Date Completed: January 1, 1959

Logged by: William H. Hisle

| Feet From - To | Bit Type & Size | Description and Remarks |
|---|---|---|
| 0 - 30 | 6¼" Rock | Hole collared in weathered conglomerate. On the surface, near this hole, there is a small area of conglomerate that carries fragments of metamorphic rocks similar to other conglomerates in the area; however, the matrix is limestone. The thickness of conglomerate drilled may be all or in part this formation. 5 inch pipe to 21 feet. |
| 30 - 70 | 4¾" Rock | Argillaceous sandstone grading to sandy clay. |
| 70 - 180 | 4¾" Rock | Clay, light colored with minor amount of sand. The difficulty of retaining return water from the hole indicates the sand may occur in strata and not throughout the clay. |
| 180 - 428 | 4¾" Rock | Sandstone, very hard from 410' to 428'. |
| 428 - 445 | 4¾" Rock | Sandstone, becoming progressively softer and more argillaceous. |
| 445 - 466 | 4¾" Rock | Clay, light colored. |
| 466 - 500 | 4¾" Rock | Conglomerate - no return water from 466' to 485' but drill progress very slow - From 485' drill cuttings indicated conglomerate. |
| 500 - 583 | 4¾" Rock | Conglomerate Mudstone (?) Drill progress and cuttings indicate intercalated strata of conglomerate and clay or mudstone. |
| 583 - 890 | 4¾" Rock | Clay and Mudstone - light colored with very minor amounts of sand. |

DETRITAL VALLEY SALT DEPOSIT Appendix E 00954

DRILL LOG & RELATED DATA

CORE DESCRIPTION FROM WELL I & Ia

ZUBER LEASE

NE $\frac{1}{4}$ SECTION 2, T29N, R21W

Elev. 1684.54

Cores collected by John McKirahan
described by Dale Simpson

| | |
|---|---|
| 356-380' | Tan brown clay generally well consolidated, in part silty clay, high angle rock cleavage ranging from vertical to about 45°, good core recovery but in part about 1" fragments (95% recovery), at 374' a compositional band indicates bedding at 65°. |
| 380- 395' | Light brown siltstone with some clayey siltstone, siltstone generally massive but shows indication of bedding at 65°, rock contains one leached fragment of limestone, about 70% core recovery. |
| 395-405' | Fine grained sandstone, some biotite present, minor conglomeritic unit has 1/8" fragments of chert or qtzt., about 80% core recovery, but core generally in fragments about ½-1", dip of conglomerate band about 65°. |
| 405-406' | Red brown clay in about 1" fragments, 70% core recovery. |
| 406-415' | Sandy to silty red brown clay, core partings at 50°, poor core recovery 30%. |
| 415-425' | No core, material to soft. |
| 425-436' | Fine grained sandstone with minor calcite cement, some bedding at 60°, fair consolidation of core and about 75% recovery. |
| 436-445' | Fine grained sandstone to siltstone, one minor clay parting, 15% core recovery. |
| 445-455' | No core recovered. |
| 455' | bottom of coring |
| 725-730' | Medium grained quartz sandstone with 70% quartz grains subrounded to rounded, 10% chert, and calcite cement, 5% recovery, 50° dip. |
| 730-747' | No core, hole stopped at 747' |

## PART 2

The following is a description of cores collected after the drill crew returned to hole 1a in an attempt to recover the hole.

| | |
|---|---|
| 730-751' | No core recovered, but heaving sand present. Sand is a subrounded to rounded quartzose rock with sand size grains. Sand may be at two horizons. |
| 751-753' | Conglomeritic clayey Siltstone with clasts averaging 0.5". One limestone clast is apparently a boulder that was cored. Limestone light gray, fossiliferous, well consolidated and probably recrystallized. The fossil may be either a straight bryozoa or a fossil twig. One foot of core recovered. |
| 753-834' | Hole drilled, no core taken. |
| 834' | Broken drill bit in hole, hole abandoned. |

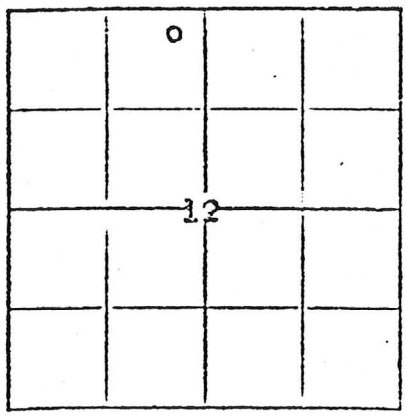
.0956

9-1147

Budget Bureau No. 42-R355.5
Approval expires Dec. 31, 1954

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

U.S. Land Office Phoenix
Serial Number AR07811
Date effective Oct. 3, 1956




Locate hole correctly, giving distance in feet from N. or S. and E. or W. line of section; when hole is not vertical, give direction and angle.

# LOG OF PROSPECT BORE HOLE Hole #2

Logs of prospect bore holes are to be transmitted in duplicate to the regional mining supervisor immediately upon completion of hole or shaft, or when work has been suspended indefinitely.

Lessee or permittee The Goldfield Consolidated Mines Company
Address One Montgomery St., San Francisco 4, Calif.
Driller Boyles Bros. Contractors
Commenced drilling 8/4/57 Finished 8/17/57
Hole No. 1 Sec. 12 T. 29N. R. 21W. M. GRSR. State Ariz.
Method of drilling Diamond coring. Logged by Simpson

The information given herewith is a complete and correct record of the bore hole and all work done thereon, so far as can be determined from all available records.

(Signed) Hart R. Witt

Date Sept. 3, 1957 (Title) Consulting Geologist

Section 35(A) of the United States Criminal Code, 18 U. S. C. 80, makes it a criminal offense to make a willfully false statement or representation to any Department or Agency of the United States as to any matter within its jurisdiction.

Elevation of top of hole [illegible] relative to sea level 1709'±

FORMATION RECORD

| Depth From Feet | Depth From Inches | Depth To Feet | Depth To Inches | Thickness of Strata Feet | Thickness of Strata Inches | Geologic formations; character of rock; oil, gas and water horizons; coal and other mineral occurrences |
|---|---|---|---|---|---|---|
| 0 | | 423 | | 423 | | Unconsolidated overburden, 0 to 60' clay and sandstones 60' to 423' not cored |
| 423 | | 434.5 | | 11.5 | | halite with minor intermixed red brown clay, in part contains trace of glauberite, good core recovery |
| 434.5 | | 458 | | 23.5 | | Complete recovery of coarse crystalline halite with trace of clay near bottom, minor clay parting at 438' |
| 458 | | 527 | | 69 | | Halite with minor trace of intermixed clay & traces of glauberite, pure halite 460-464', good core recovery. |
| 527 | | 540 | | 13 | | Complete recovery of pure very coarse crystalline halite. |
| 540 | | 574.5 | | 34.5 | | Halite with minor to trace of clay, good core recovery. |
| 574.5 | | 575 | | .5 | | 6" clay parting with traces of glauberite |
| 575 | | 683 | | 108 | | Halite with minor to trace of clay, pure halite at 587-589', 612.5-617.5', 650-660', 677-680', 680.5-682', in part core has traces of glauberite, good core recovery. |
| 683 | | 694 | | 11 | | Clay & siltstone partings at 683-683.5', 687.5-689', 692-694', in halite with minor to major amount of cla- |
| 694 | | 719.5 | | 25.5 | | Halite with minor clay and traces of glauberite, good core recovery. |
| 719.5 | | 726 | | 6.5 | | Halite with a major amount of clay and clay partings at 719.5-721' and 725-726', good core recovery |
| 726 | | 745 | | 19 | | Halite with minor clay, pure halite 735-737', good core recovery |
| 745 | | 746 | | 1 | | Complete recovery of silty brown clay parting. |

E-3

| From | To | Thickness | Geologic formations, etc. |
|---|---|---|---|
| 746 | 864.5 | 118.5 | Halite with minor to trace of clay, traces of glauberite, and minor clay partings at 833.2' and 836', pure halite at 790-793', 827-830', 831-831.5 good core recovery. |
| 864.5 | 865.5 | 1 | Complete recovery of 1' silty clay parting. |
| 865.5 | 935 | 69.5 | Halite with trace of clay, and minor clay partings at 880.5-881, 904.3-905, pure halite at 891.5-893' good core recovery. |
| 935 | 938.5 | 3.5 | Good recovery of red brown siltstone parting. |
| 938.5 | 944.5 | 6 | Complete recovery of med. crystalline anhydrite. |
| 944.5 | 947 | 2.5 | Red brown silty sandstone parting, good recovery. |
| 947 | 997 | 50 | Halite with minor to trace ofclay, many clay parti 954-954.5', red siltstone parting 956.5-957', good core recovery. |
| 997 | 1000 | 3 | Complete recovery of coarse crystalline pure halit |
| 1000 | 1030 | 30 | Halite with minor to trace of clay and minor clay partings at 1012.5', 1016', 1028.5', good core recovery. |
| 1030 | 1032 | 2 | Complete recovery of red brown siltstone parting. |
| 1032 | 1039.5 | 7.5 | Complete recovery of anhydrite with trace of clay increasing near bottom of core. |
| 1039.5 | 1040.5 | 1 | Complete recovery of pure coarse crystalline halit |
| 1040.5 | 1047 | 6.5 | Siltstone with minor to trace of anhydrite, compl core recovery. |

This hole now suspended with NX casing cemented at 634'. May be deepened later.

No water encountered in hole.

Lost circulation in salines at several points.

Reduced circulation return at bottom, 1047'.

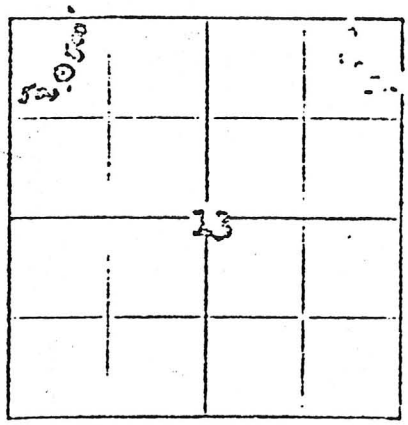
"Good core recovery" indicates 90% or better.

8-1147

Budget Bureau No. 42-R352.2
Approval expires Dec. 31, 1954

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

U. S. Land Office Phoenix
Serial Number
Date effective




Locate hole correctly, giving distance in feet from N. or S. and E. or W. line of section; when hole is not vertical, give direction and angle.

# LOG OF PROSPECT BORE HOLE Hole #3

Logs of prospect bore holes are to be transmitted in duplicate to the regional mining supervisor immediately upon completion of hole or shaft, or when work has been suspended indefinitely.

Lessee or permittee Jim Smith, assigned to Colorado Corp.
Address One Montgomery Street, San Francisco 4, Calif.
Driller Foyles Bros. Drilling Co., Salt Lake City, Utah
Commenced drilling 8-24-57 Finished 9-10-57
Hole No. 1 Sec. 13 T. 23N. R. 21W. M. G&SRB&M State Arizona
Method of drilling Diamond Logged by D. L. Simpson

The information given herewith is a complete and correct record of the bore hole and all work done thereon, so far as can be determined from all available records.

RECEIVED S.P. SEP 1 1957

(Signed) [illegible]

Date Sept 17, 1957 (Title) Consulting Geologist

Section 35(A) of the United States Criminal Code, 18 U. S. C. 80, makes it a criminal offense to make a willfully false statement or representation to any Department or Agency of the United States as to any matter within its jurisdiction.

Elevation of top of hole relative to sea level 1965 feet

FORMATION RECORD

| DEPTH From Feet | DEPTH From Inches | DEPTH To Feet | DEPTH To Inches | Thickness of stratum Feet | Thickness of stratum Inches | Geologic formations; character of rock, oil, gas and water horizons; coal and other mineral occurrences |
|---|---|---|---|---|---|---|
| 0 | | 120 | | 120 | | Recent valley fill, ~~uncemented and unconsolidated~~ uncemented and unconsolidated. Not Cored. |
| 120 | | 180 | | 60 | | Impure Sandstone - Cored 124-180, med to ~~coarse grained, in part pebble~~ coarse [illegible] matrix. Clasts of quartz, ls, and [illegible] |
| 180 | | 385 | | 205 | | Hard Boulder Conglomerate with minor [illegible] and clay [illegible] sandstone and 30% clay. Sandstone [illegible] ~~unconsolidated~~, [illegible] |
| 385 | | 570 | | 185 | | Clay, Gypsum, and Sandstone - Cored 404-409, med clay, gypsum & sandstone. Clay ~~brown clay and sandstone, probably well consolidated, sandstone not [illegible]~~ [illegible] of core recovered. Cored [illegible], interbedded gypsum and clay, probably nearly horizontal, [illegible] of core recovered. |
| 570 | | 599 | | 29 | | Halite, clay, and gypsum - Cored [illegible], complete core recovery of halite with [illegible] and gypsum. Several crystals of glauberite [illegible] |

Hole bottomed at 599 feet with a parted casing at 426.5 feet. No water encountered.

LPO-63-53973

E-5

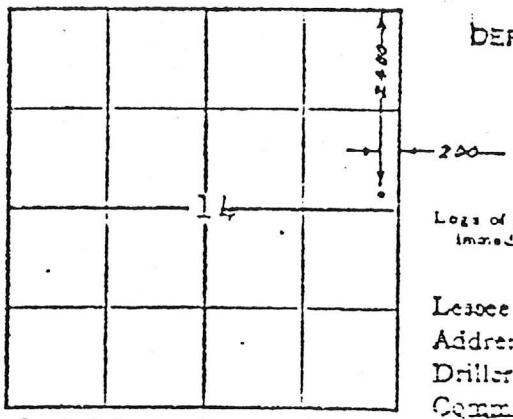
Copies only. 4 copies mailed to U.S.G.S. from Boulder City on Sept 25

0-1147

Budget Bureau No. 42-R355.2
Approval expires Dec. 31, 1954

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

U. S. Land Office Phoenix
Serial Number 07311
Date effective Oct. 5, 1956




Locate hole correctly, giving distance in feet from N. or S. and E. or W. lines of section; when hole is not vertical, give direction and angle.

# LOG OF PROSPECT BORE HOLE

Logs of prospect bore holes are to be transmitted in duplicate to the regional mining supervisor immediately upon completion of hole or shaft, or when work has been suspended indefinitely.

Lessee or permittee DuCharme, assigned to Goldfield Consolidated Mines Company
Address 1 Montgomery St., San Francisco 4, Calif.
Driller Bowles Brothers Drilling Company
Commenced drilling Sept. 13, 1957 Finished Oct. 28, 1957
Hole No. 4 Sec. 11 T. 20N. R. 21W. G. & S. R. State Ariz.
Method of drilling Rock bit and core Logged by [illegible]

The information given herewith is a complete and correct record of the bore hole and all work done thereon, so far as can be determined from all available records.

(Signed) Robert M. Hill

Date November 4, 1957 (Title) Consulting Geologist

Section 35(A) of the United States Criminal Code, 18 U. S. C. 80, makes it a criminal offense to make a willfully false statement or representation to any Department or Agency of the United States as to any matter within its jurisdiction.

Elevation of top of hole relative to sea level 1986

## FORMATION RECORD

| DEPTH From— Feet | Inches | DEPTH To— Feet | Inches | Thickness of stratum Feet | Inches | Geologic formations; character of rock; oil, gas and water horizons; coal and other mineral occurrences |
|---|---|---|---|---|---|---|
| 0 | | 120 | | 120 | | Unconsolidated valley fill. |
| 120 | | 217 | | 97 | | Clay and sandstone. |
| 217 | | 402 | | 185 | | Boulder conglomerate. |
| 402 | | 555 | | 153 | | Brown & gray clays w/ thin interbed. gypsum |
| 555 | | 565 | | 10 | | Brown & gray clays w/ disseminated and interbed. dense anhydrite. |
| 565 | | 615 | | 50 | | Anhydrite w/ brown and gray clays. |
| 615 | | 630 | | 15 | | Halite, minor clay. |
| 630 | | 645 | | 15 | | Halite, trace clay, scattered anhydrite crystals |
| 645 | | 647 | | 2 | | Halite, almost pure. |
| 647 | | 876 | | 229 | | Halite, minor brown clay, clay partings at 690 and 706. |
| 876 | | 899 | | 23 | | Halite, minor anhydrite and brown clay. |
| 899 | | 924 | | 25 | | Halite, minor gray and brown clay, clay partings at 905 and 908. |
| 924 | | 927 | | 3 | | Siltstone, gray, w/ 10% halite. |
| 927 | | 974 | | 47 | | Halite, minor gray and brown clays. |
| 974 | | 976 | | 2 | | Anhydrite, crystalline, w/ halite and brown clay. |
| 976 | | 985 | | 9 | | Halite, 30% brown clay, minor anhydrite. |
| 985 | | 990 | | 5 | | Anhydrite, 20% clay, 15% halite. |
| 990 | | 996 | | 6 | | Halite, 15% brown clay, minor anhydrite, clay partings at 994. |
| 996 | | 997 | | 1 | | Clay, silty, brown, w/ scattered crystals halite and anhydrite. |
| 997 | | 1013 | | 16 | | Halite, 20% brown clay, a few anhydrite crystals, & clay partings 1008 to 1013. |
| 1013 | | 1014 | | 1 | | Clay, silty, brown. |
| 1014 | | 1025 | | 11 | | Anhydrite, 15% brown clay, 10% halite (Continued) |

GPO-61-49570

E-6

Hole #4

FORMATION RECORD (Con't)

| Depth From | Depth To | Thickness | |
|---|---|---|---|
| 1025 | 1028 | 3 | Clay, brown, 50% intermixed anhydrite crystals, few halite crystals. |
| 1028 | 1029 | 1 | Halite, trace clay. |
| 1029 | 1055 | 26 | Halite and brown clay w/ 25% anhydrite. |
| 1055 | 1117 | 62 | Interbedded dense anhydrite and reddish brown clay w/ few halite crystals 1114 to 1117. |
| 1117 | 1129 | 12 | Halite, minor clay. |
| 1129 | 1133 | 4 | Clay, reddish brown, minor halite. |
| 1133 | 1139 | 6 | Halite, 15% clay. |
| 1139 | 1153 | 14 | Clay, reddish brown, 30% anhydrite, few halite crystals. |
| 1153 | 1191 | 38 | Clay, reddish brown and anhydrite. |
| 1191 | 1330 | 139 | Interbedded brown clay, siltstone, sandstone, pebble conglomerate, and tuff. |
| 1330 | 1360 | 30 | Interbedded brown clay, siltstone, sandstone, pebble conglomerate, and minor tuff. |
| 1360 | 1392 | 32 | Interbedded brown clay, siltstone, sandstone, pebble conglomerate. Clastic material from 1203 to 1392 is partially volcanic origin. |

132 NaCl

524' salt-clay-anhydrite (43± [illegible])

top section 50' anhydrite not [illegible] evaporation

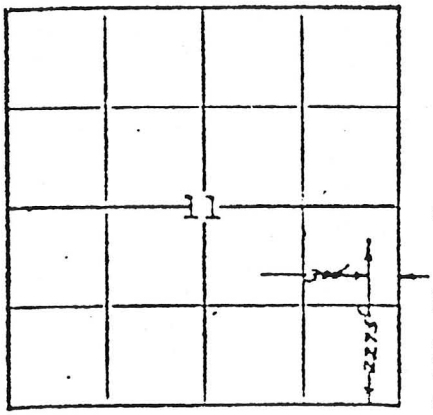
00961

9-1147

Budget Bureau No. 42-R352.2
Approval expires Dec. 31, 1954

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

U.S. Land Office Phoenix
Serial Number 07764
Date effective Feb. 27, 1956




Locate hole correctly, giving distance in feet from N. or S. and E. or W. line of section; when hole is not vertical, give direction and angle.

# LOG OF PROSPECT BORE HOLE

Logs of prospect bore holes are to be transmitted in duplicate to the regional mining supervisor immediately upon completion of hole or shaft, or when work has been suspended indefinitely.

Lessee or permittee Zuber, assigned to The Goldfield Consolidated Mines Company
Address One Montgomery St., San Francisco 4, Calif.
Driller Boyles Brothers Drilling Company
Commenced drilling Oct. 31, 1957 Finished Nov. 20, 1957
Hole No. 5 Sec. 11 T. 29N R. 21W M. G&SRB State Ariz.
Method of drilling Rock bit & core Logged by A. J. Graves

The information given herewith is a complete and correct record of the bore hole and all work done thereon, so far as can be determined from all available records.

(Signed) Herbert N. Witt
Herbert N. Witt
(Title) Consulting Geologist

Date November 30, 1957

Section 35(A) of the United States Criminal Code, 18 U. S. C. 80, makes it a criminal offense to make a willfully false statement or representation to any Department or Agency of the United States as to any matter within its jurisdiction.

Elevation of top of hole relative to sea level 1390 ft.

FORMATION RECORD

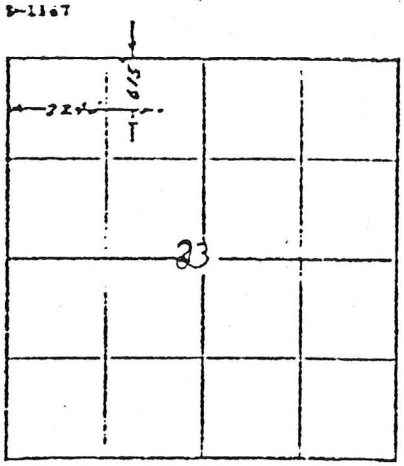
| Depth From (Feet, Inches) | Depth To (Feet, Inches) | Thickness of stratum (Feet, Inches) | Geologic formations; character of rock; oil, gas and water horizons; coal and other mineral occurrences |
|---|---|---|---|
| 0 | 80 | 80 | Recent unconsolidated valley fill. |
| 80 | 283 | 203 | Interbedded boulder conglomerate and sands. |
| 283 | 445 | 162 | Interbedded clays, siltstones, and gypsum. |
| 445 | 465 | 20 | Brown clay and anhydrite. (Beds up to 1/2") |
| 465 | 515 | 50 | Halite, minor anhydrite, gray and brown clays. |
| 515 | 580 | 65 | Halite, trace gray and brown clays. |
| 580 | 581 | 1 | Anhydrite, 40% halite, trace brown clay. |
| 581 | 701 | 120 | Halite, trace to minor brown and gray clays; 6" gray clay parting at 629 and 636. |
| 701 | 876 | 175 | Halite, trace brown and gray clay; anhydrite xls @81 |
| 876 | 882 | 6 | Halite, 35% anhydrite as impalpable grains. |
| 882 | 997 | 115 | Halite, trace to minor brown and gray clays; 3" gray clay and anhydrite parting @ 946 and 954. |
| 997 | 999 | 2 | Clay, brown, scattered halite and anhydrite crystals |
| 999 | 1015 | 16 | Halite, minor brown clay. |
| 1015 | 1016 | 1 | Clay, brown, scattered crystals halite. |
| 1016 | 1037 | 21 | Halite, trace brown and gray clays. |
| 1037 | 1068 | 31 | Halite, minor brown clay, trace anhydrite, 3" clay partings at 1044 and 1065. |
| 1068 | 1182 | 114 | Halite, trace brown clay. |
| 1182 | 1186 | 4 | Clay, reddish brown, minor halite crystals. |
| 1186 | 1198 | 12 | Clay, reddish brown, 25% halite and 10% anhydrite. |
| 1198 | 1204 | 6 | Halite, trace brown clay and anhydrite. |
| 1204 | 1206 | 2 | Anhydrite, minor brown clay, trace halite. |
| 1206 | 1212 | 6 | Halite, 50% reddish brown clay, trace anhydrite. |
| 1212 | 1214 | 2 | Anhydrite, 40% brown clay. |
| 1214 | 1216 | 2 | Halite, trace brown clay. |

GPO-83-38573

E-8

00962

S-1167




Locate hole correctly, giving distance in feet from N. or S. and E. or W. line of section; when hole is not vertical, give direction and angle.

Budget Bureau No. 42-R332.1
Approval expires Dec. 31, 1954

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

U.S. Land Office Phoenix
Serial Number 07753
Date effective February 26, 19

# LOG OF PROSPECT BORE HOLE

Logs of prospect bore holes are to be transmitted in duplicate to the regional mining supervisor immediately upon completion of hole or shaft, or when work has been suspended indefinitely.

Lessee or permittee Keegel, assigned to The Goldfield Consolidated Mines Company
Address One Montgomery Street, San Francisco 1, Cal
Driller Boyles Brothers Drilling Company
Commenced drilling October 29, 1957 Finished November 25, 195
Hole No. 6 ~~6A~~ Sec. 23 T. 29N. R. 21W. M.G&SRB State Ariz.
Method of drilling Rock bit & core Logged by A. J. Graves

The information given herewith is a complete and correct record of the bore hole and all work done thereon, so far as can be determined from all available records.

(Signed) Herbert H. Witt
Herbert H. Witt
(Title) Consulting Geologist

Date November 30, 1957

Section 35(A) of the United States Criminal Code, 18 U. S. C. 80, makes it a criminal offense to make a willfully false statement or representation to any Department or Agency of the United States as to any matter within its jurisdiction.

Elevation of top of hole relative to sea level 1582

FORMATION RECORD

| DEPTH From— Feet | Inches | To— Feet | Inches | Thickness of stratum Feet | Inches | Geologic formations; character of rock; oil, gas and water horizons; coal and other mineral occurrences |
|---|---|---|---|---|---|---|
| 0 | | 120 | | 120 | | Recent unconsolidated valley fill. |
| 120 | | 190 | | 70 | | Interbedded boulder conglomerate and sands. |
| 190 | | 410 | | 220 | | Boulder conglomerate, probably well cemented. |
| 410 | | 688 | | 278 | | Clays and gypsum. |
| 688 | | 773 | | 85 | | Clays and anhydrite. |
| 773 | | 785 | | 12 | | Halite, 5% anhydrite, trace brown clay. |
| 785 | | 805 | | 20 | | Halite, trace brown and gray clays. |

# DRILL LOG

## GOLDFIELD, DETRITAL VALLEY SALINE - HOLE NO. 6A

Location: NE¼, NW¼ Section 23, Township 29N., Range 21W., Gila and Salt River Meridain

Elevation: 1882 Feet

Inclination: Vertical Depth: 1136 Feet

Type of Drills: Portadrill and Boyles - Joy 22 Diamond Drill

Date Started: 1st Drilling, October 29, 1957
Date Completed: 1st Drilling, November 25, 1957

Date Started: 2nd Drilling, October 30, 1958
Date Completed: 2nd Drilling, November 8, 1958

Logged by: A. J. Graves, 0 to 805 Feet
William H. Hisle, 803 to 1136 Feet

| Feet From - To | | Core Recovery, % | Bit Type & Size | Description and Remarks |
|---|---|---|---|---|
| 0 - 120 | | — | — | Recent unconsolidated Valley Fill. |
| 120 - 190 | | — | — | Interbedded boulder conglomerates and sands. |
| 190 - 410 | | — | — | Boulder Conglomerate, probably well cemented. |
| 410 - 683 | | — | — | Clay and Gypsum |
| 683 - 773 | | — | — | Clay and Anhydrite |
| 773 - 785 | 12 | — | — | Halite, 5% Anhydrite, trace of Brown Clay. |
| 785 - 805 | 20 | — | — | Halite, trace of Brown and Gray Clay. |

A difference of 2 feet exists between reported depth of the hole at the completion of the first drilling and the depth at the beginning of the second drilling. (In the following descriptions, predominate impurity listed first.)

| | | | | |
|---|---|---|---|---|
| 803 - 806 | 3 | 100 | NX - D.B. | Halite, ±20% Clay, minor Anhydrite |
| 806 - 807½ | 1.5 | 90 | NX - D.B. | Halite, ±5% Clay |
| 807½ - 808½ | 1.0 | 90 | NX - D.B. | Halite, ±20% Clay |

1136
773
363

E-10

Page 2. Drill Log - Hole No. 0A

| Feet From - To | | Core Recovery, % | Bit Type & Size | Description and Remarks |
|---|---|---|---|---|
| 808½ - 818 | 10 | 95 | NX - D.D. | Halite, ±5% Clay |
| 818 - 819 | 1.0 | 100 | NX - D.D. | Halite, ±10% Clay |
| 819 - 823½ | 4.0 | 100 | NX - D.D. | Halite, ±5% Clay |
| 823½ - 833 | 14.0 | 95 | NX - D.D. | Halite, ±20% Clay, minor Anhydrite |
| 833 - 840 | 2.0 | 100 | NX - D.D. | Halite, ±10% Clay |
| 840 - 842 | 2.0 | 100 | NX - D.D. | Halite, ±5% Clay |
| 842 - 844 | | 100 | NX - D.D. | Halite, ±10% Clay |
| 844 - 846 | | 100 | NX - D.D. | Halite, ±20% Clay and Anhydrite |
| 846 - 849 | | 100 | NX - D.D. | Halite, ±30% Clay and Anhydrite |
| 849 - 853 | | 100 | NX - D.D. | Halite, ±15% Clay and Anhydrite |
| 853 - 855 | | 100 | NX - D.D. | Halite, ±10% Clay and Anhydrite |
| 8[illegible] - 856 | | 100 | NX - D.D. | Halite, ±40% Clay and Anhydrite |
| 856 - 858 | | 100 | NX - D.D. | Halite, ±15% Clay |
| 858 - 859 | | 100 | NX - D.D. | Halite, ±30% Clay, minor Anhydrite |
| 859 - 866 | | 100 | NX - D.D. | Halite, ±15% Clay |
| 866 - 870 | | 100 | NX - D.D. | Halite, ±10% Clay |
| 870 - 873 | | 100 | NX - D.D. | Halite, ±15% Clay, minor Anhydrite |
| 873 - 876 | | 100 | NX - D.D. | Halite, ±20% Clay and Anhydrite |
| 876 - 882 | | 100 | NX - D.D. | Halite, ±15% Clay |
| 882 - 886 | | 100 | NX - D.D. | Halite, ±10% Clay |
| 886 - 890 | | 100 | NX - D.D. | Halite, ±15% Clay |
| 890 - 900 | | 95 | NX - D.D. | Halite, ±10% Clay |
| 900 - 903 | | 90 | NX - D.D. | Halite, ±30% Clay |
| 903 - 907½ | | 95 | NX - D.D. | Halite, ±1% visible impurities |
| 907½ - 908 | 5.0 | 90 | NX - D.D. | Clay, minor Anhydrite |

Page 3. Drill Log - Hole No. GA

| Feet From | - To | | Core Recovery, % | Bit Type & Size | Description and Remarks |
|---|---|---|---|---|---|
| 908 | - 912 | 4 | 95 | NX - D.D. | Halite, ±5% Clay |
| 912 | - 919 | 7 | 100 | NX - D.D. | Halite, ±10% Clay, minor Anhydrite |
| 919 | - 922 | 3 | 100 | NX - D.D. | Halite, ±20% Clay and Anhydrite |
| 922 | - 926 | 4 | 100 | NX - D.D. | Halite, ±40% Clay and Anhydrite |
| 926 | - 927½ | 1 | 85 | NX - D.D. | Halite, ±30% Clay |
| 927½ | - 931 | 3 | 85 | NX - D.D. | Halite, ±5% Clay |
| 931 | - 936½ | 5 | 90 | NX - D.D. | Halite, ±10% Clay |
| 936½ | - 939½ | 3 | 90 | NX - D.D. | Halite, ±15% Clay, minor Anhydrite |
| 939½ | - 941 | 2 | 85 | NX - D.D. | Halite, ±40% Clay and Anhydrite |
| 941 | - 942 | 1 | 60 | NX - D.D. | Clay, minor Halite and Anhydrite |
| 942 | - 945 | 3 | 90 | NX - D.D. | Halite, ±20% Clay, minor Anhydrite |
| 945 | - 947 | 2 | 95 | NX - D.D. | Halite, ±5% Clay |
| 947 | - 952 | 5 | 100 | NX - D.D. | Halite, less than 1% impurities |
| 952 | - 956 | 4 | 100 | NX - D.D. | Halite, ±10% Clay |
| 956 | - 961 | 5 | 100 | NX - D.D. | Halite, ±15% Clay and Anhydrite |
| 961 | - 966 | 5 | 100 | NX - D.D. | Halite, ±20% Clay and Anhydrite |
| 966 | - 969 | 3 | 100 | NX - D.D. | Halite, ±5% Clay |
| 969 | - 971 | 2 | 100 | NX - D.D. | Halite, ±15% Clay, minor Anhydrite |
| 971 | - 975½ | 4 | 100 | NX - D.D. | Halite, ±20% Clay and Anhydrite |
| 975½ | - 976 | 1 | 60 | NX - D.D. | Clay, minor Anhydrite and Halite |
| 976 | - 978 | 2 | 100 | NX - D.D. | Halite, ±50% Anhydrite and Clay |
| 978 | - 984 | 6 | 100 | NX - D.D. | Halite, ±30% Clay, minor Anhydrite |
| 984 | - 986 | 2 | 100 | NX - D.D. | Halite, ±20% Clay |
| 986 | - 987 | 1 | 100 | NX - D.D. | Halite, ±10% Clay |

Page 4. Drill Log - Hole N 6A

| Feet From - To | Core Recovery, % | Bit Type & Size | Description and Remarks |
|---|---|---|---|
| 987 - 989 | 95 | NX - D.D. | Halite, ±30% Clay - 3" Clay seam at ± 988 |
| 989 - 991 | 100 | NX - D.D. | Halite, ±20% Clay |
| 991 - 994 | 100 | NX - D.D. | Halite, ±15% Clay, minor Anhydrite |
| 994 - 996 | 100 | NX - D.D. | Halite, ±20% Clay and Anhydrite |
| 996 - 1004 | 100 | NX - D.D. | Halite, ±30% Clay and Anhydrite |
| 1004 - 1006 | 100 | NX - D.D. | Halite, ±5% Clay |
| 1006 - 1010 | 100 | NX - D.D. | Halite, ±30% Clay and Anhydrite |
| 1010 - 1012 | 100 | NX - D.D. | Halite, ±40% Anhydrite, minor Clay |
| 1012 - 1013½ | 100 | NX - D.D. | Anhydrite |
| 1013½ - 1019 | 100 | NX - D.D. | Halite, ±20% Clay and Anhydrite |
| 1019 - 1024 | 100 | NX - D.D. | Halite, ±10% Clay and Anhydrite |
| ? 4 - 1030 | 95 | NX - D.D. | Halite, ±20% Anhydrite and Clay |
| 1030 - 1031 | 100 | NX - D.D. | Halite, ±5% Clay |
| 1031 - 1033 | 100 | NX - D.D. | Halite, ±20% Clay |
| 1033 - 1036 | 95 | NX - D.D. | Halite, ±15% Clay |
| 1036 - 1046½ | 95 | NX - D.D. | Halite, ±30% Clay, minor Anhydrite |
| 1046½ - 1048 | 100 | NX - D.D. | Halite, ±10% Clay |
| 1048 - 1057 | 95 | NX - D.D. | Halite, ±20% Clay and Anhydrite |
| 1057 - 1059 | 100 | NX - D.D. | Halite, ±10% Clay |
| 1059 - 1064 | 100 | NX - D.D. | Halite, ±20% Clay and Anhydrite |
| 1064 - 1067½ | 100 | NX - D.D. | Halite, ±15% Clay, minor Anhydrite |
| 1067½ - 1075 | 100 | NX - D.D. | Halite, ±20% Clay and Anhydrite 4" Clay seam at ±1070 |
| 1075 - 1076 | 100 | NX - D.D. | Halite, ±15% Clay |

Page 5. Drill Log - Hole No. GA

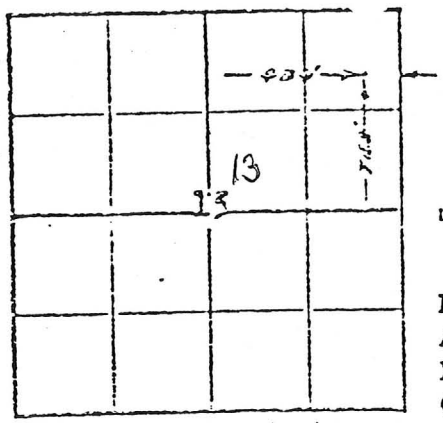
| Feet From - To | Core Recovery, % | Bit Type & Size | Description and Remarks |
|---|---|---|---|
| 1076 - 1082 | 90 | NX - D.D. | Halite, ±40% Clay and Anhydrite |
| 1082 - 1086 | 90 | NX - D.D. | Halite, ±40% Anhydrite and Clay |
| 1086 - 1089½ | 100 | NX - D.D. | Halite, ±10% Clay, minor Anhydrite |
| 1089½ - 1092 | 100 | NX - D.D. | Halite, ±15% Clay, minor Anhydrite |
| 1092 - 1104½ | 100 | NX - D.D. | Halite, ±30% Clay and Anhydrite |
| 1104½ - 1106 | 100 | NX - D.D. | Halite, ±20% Clay and Anhydrite |
| 1106 - 1111 | 95 | NX - D.D. | Halite, ±15% Clay |
| 1111 - 1118 | 90 | NX - D.D. | Halite, ±40% Anhydrite and Clay |
| 1118 - 1131 | 80 | NX - D.D. | Anhydrite and Clay, minor Halite |
| 1131 - 1133 | 60 | NX - D.D. | Halite, ±30% Clay and Anhydrite |

46 Salt
36 [illegible] Anhydrite (17' [illegible] + 30+)

Budget Bureau No. 42-R1212.2
Approval expires Dec. 31, 1954

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

U. S. Land Office Phoenix
Serial Number 015377
Date effective April 17, 1957




Locate hole correctly, giving distance in feet from lines, or if a land survey of record, section, township and range. If hole is not vertical, give direction and angle.

# LOG OF PROSPECT BORE HOLE

Logs of prospect bore holes are to be transmitted in duplicate to the regional mining supervisor immediately upon completion of hole or shaft, or when work has been suspended indefinitely.

Lessee or permittee: Kosgel, assigned to The Goldfield Consolidated Mines Company
Address: 626 Montgomery Street, San Francisco 1, Calif.
Driller: Boyles Brothers Drilling Company
Commenced drilling: Dec. 4, 1957 Finished: Dec. 30, 1957
Hole No. 7-27A Sec. 13 T. 29N R. 21W G&SR Meridian APIB.
Method of drilling: Rock bit & Core Logged by: A. J. Grates

The information given herewith is a complete and correct record of the bore hole and all work done thereon, so far as can be determined from all available records.

(Signed) Herbert N. Witt
(Title) Consulting Geologist

Date January 3, 1958

Section 35(A) of the United States Criminal Code, 18 U. S. C. 80, makes it a criminal offense to make a wilfully false statement or representation to any Department or Agency of the United States as to any matter within its jurisdiction.

Elevation of top of hole, 2760 ft., relative to sea level

FORMATION RECORD

| Depth From (Feet, Inches) | Depth To (Feet, Inches) | Thickness of formation (Feet, Inches) | Geologic formations; character of rock; oil, gas and water horizons; coal and other mineral occurrences |
|---|---|---|---|
| 0 | 237 | 237 | Recent unconsolidated valley fill. |
| 237 | 437 | 200 | Boulder conglomerate. |
| 437 | 671 | 234 | Clay, gypsum, and anhydrite (lower part of section) |
| 671 | 691 | 20 | Halite, 10% clay, 5% anhydrite. |
| 691 | 768 | 77 | Halite, trace clay, several anhydrite crystals. |
| 768 | 797 | 29 | Halite, 5% clay. |
| 797 | 843 | 32 | Halite, trace clay. |
| 843 | 873 | 25 | Halite, almost pure. |
| 873 | 923 | 50 | Halite, trace clay, trace anhydrite, 3" clay and anhydrite parting at 881'. |
| 923 | 1011 | 88 | Halite, trace clay, several anhydrite xls at 992. |
| 1011 | 1068 | 57 | Halite, 5% clay, 10% anhydrite. |
| 1068 | 1122 | 54 | Halite, 15% clay, trace glauberite (?) at 1079-1080. |
| 1122 | 1124 | 2 | Anhydrite, impalpable, 25% halite. |
| 1124 | 1177 | 53 | Halite, 5-10% clay, trace glauberite (?) at 1147-1150. |
| 1177 | 1215 | 38 | Interbedded and intermixed halite, clay, and anhydrite, beds up to 4'. |
| 1215 | 1218 | 3 | Clay, trace halite. |
| 1218 | 1223 | 5 | Halite, 30% clay. |
| 1223 | 1225 | 2 | Clay, trace halite. |
| 1225 | 1229 | 5 | Clay. |

# DRILL LOG

## GOLDFIELD, DETRITAL VALLEY SALINE - HOLE NO. 8

Location: SE¼, NE¼ Section 10, Township 20N., Range 21W., Gila and Salt River Meridain

Elevation: ± 1845 Feet

Inclination: Vertical  Depth: 1066 Feet

Type of Drills: Failing 1500 Rotary and Boyles - Joy 22 Diamond Drill

Date Started: October 7, 1958  Date Completed: October 28, 1958

Logged by: William H. Hisle

| Feet From - To | Core Recovery, % | Bit Type & Size | Description and Remarks |
|---|---|---|---|
| 0 - 97 | — | 6¼", Rock | Recent Valley Fill, unconsolidated, not cored. Set 5" pipe to 97'. |
| ~~97~~ 97 - 604 | — | 4 3/4", Rock | Conglomerate with sandstone lenses, not cored. Salt entered +600'. Set 585' of 3" pipe, attempted to anchor 3" pipe by cementing. |
| | | | (In following description, predominate impurity listed first.) |
| 604 - 612 | 90 | NX - D.D. | Halite, ±5% Anhydrite and Clay partings. |
| 612 - 624 | 100 | NX - D.D. | Halite, ±10% Anhydrite and Clay. |
| 624 - 637 | 100 | NX - D.D. | Halite, ±5% Clay and Anhydrite. |
| 637 - 655 | 100 | NX - D.D. | Halite, ±10% Clay and Anhydrite. |
| 655 - 659 | 100 | NX - D.D. | Halite, ±5% Clay and minor Anhydrite. |
| 659 - 671 | 95 | NX - D.D. | Halite, ±10% Clay and minor Anhydrite. |
| 671 - 673 | 100 | NX - D.D. | Halite, ±15% Clay and Anhydrite. |
| 673 - 674½ | 100 | NX - D.D. | Halite, ±10% Clay and minor Anhydrite. |
| 674½ - 685 | 100 | NX - D.D. | Halite, ±20% Clay and Anhydrite. |
| 68[illegible] - 686½ | 100 | NX - D.D. | Halite, ±5% Clay |

Page 2. Drill Log - Hole No. 8

| Feet Fr - To | Core Recovery, % | Bit Type & Size | Description and Remarks |
|---|---|---|---|
| 688½ - 695 | 92 | NX - D.D. | Halite, ±10% Clay |
| 695 - 696½ | 100 | NX - D.D. | Halite, less than 5% Clay |
| 696½ - 705½ | 100 | NX - D.D. | Halite, ±15% Clay and Anhydrite |
| 705½ - 706 | 50 | NX - D.D. | Clay, ±20% Anhydrite and Halite |
| 706 - 708½ | 100 | NX - D.D. | Halite, ±5% Clay and minor Anhydrite |
| 708½ - 712 | 100 | NX - D.D. | Halite, ±20% Anhydrite and Clay |
| 712 - 715 | 100 | NX - D.D. | Halite, less than 3% Clay |
| 715 - 717 | 100 | NX - D.D. | Halite, ±5% Clay and minor Anhydrite |
| 717 - 721 | 100 | NX - D.D. | Halite, ±10% Clay and Anhydrite |
| 721 - 732 | 100 | NX - D.D. | Halite, ±15% Clay and Anhydrite |
| 732 - 733 | 100 | NX - D.D. | Halite, ±10% Clay and Anhydrite |
| 733 - 741 | 90 | NX - D.D. | Halite, ±30% Clay and Anhydrite |
| 741 - 744 | 100 | NX - D.D. | Halite, ±10% Clay and minor Anhydrite |
| 744 - 751 | 100 | NX - D.D. | Halite, ±20% Clay and Anhydrite |
| 751 - 757 | 100 | NX - D.D. | Halite, ±20% Anhydrite and Clay, Glauberite at 752.5' |
| 757 - 762 | 100 | NX - D.D. | Halite, ±10% Anhydrite and Clay |
| 762 - 772 | 100 | NX - D.D. | Halite, ±20% Anhydrite and Clay |
| 772 - 776 | 100 | NX - D.D. | Halite, ±5% Clay |
| 776 - 784 | 100 | NX - D.D. | Halite, ±30% Clay and Anhydrite, Clay very red at 783.5' |
| 784 - 787 | 100 | NX - D.D. | Halite, ±20% Clay and Anhydrite |
| 787 - 791 | 100 | NX - D.D. | Halite, ±10% Clay and minor Anhydrite |
| 791 - 800 | 90 | NX - D.D. | Halite, ±5% Clay |
| 8[illegible] - 811 | 100 | NX - D.D. | Halite, ±15% clay and minor Anhydrite |
| 811 - 817 | 100 | NX - D.D. | Halite, ±20% Clay and Anhydrite |

Page 3. Drill Log - Hole [illegible] 8

| Feet From - To | Core Recovery, % | Bit Type & Size | Description and Remarks |
|---|---|---|---|
| 817 - 821 | 100 | NX - D.D. | Halite, ±5% Clay |
| 821 - 831 | 100 | NX - D.D. | Halite, ±20% Clay and minor Anhydrite |
| 831 - 835 | 100 | NX - D.D. | Halite, ±5% Clay |
| 835 - 839 | 90 | NX - D.D. | Halite, ±30% Clay and minor Anhydrite |
| 839 - 848 | 100 | NX - D.D. | Halite, ±5% Clay |
| 848 - 856 | 100 | NX - D.D. | Halite, ±20% Clay and minor Anhydrite |
| 856 - 864 | 100 | NX - D.D. | Halite, ±5% Clay |
| 864 - 867 | 100 | NX - D.D. | Halite, ±10% Clay |
| 867 - 870 | 100 | NX - D.D. | Halite, ±30% Clay and Anhydrite |
| 870 - 871½ | 100 | NX - D.D. | Halite, ±5% Clay |
| 871½ - 876 | 95 | NX - D.D. | Halite, ±30% Clay and Anhydrite |
| 87[illegible] - 883 | 100 | NX - D.D. | Halite, ±10% Clay and minor Anhydrite |
| 883 - 901 | 100 | NX - D.D. | Halite, ±15% Clay and Anhydrite |
| 901 - 903 | 90 | NX - D.D. | Anhydrtic and Clay, minor Halite |
| 903 - 910 | 100 | NX - D.D. | Halite, ±30% Clay and Anhydrite |
| 910 - 914 | 100 | NX - D.D. | Halite, ±10% Clay and Anhydrite |
| 914 - 918 | 100 | NX - D.D. | Halite, ±40% Anhydrite and Clay |
| 918 - 925 | 100 | NX - D.D. | Halite, ±20% Clay and Anhydrite |
| 925 - 931 | 100 | NX - D.D. | Halite, ±30% Clay and Anhydrite |
| 931 - 932½ | 90 | NX - D.D. | Anhydrite and Clay |
| 932½ - 935 | 100 | NX - D.D. | Halite, ±20% Anhydrite and Clay |
| 935 - 939 | 100 | NX - D.D. | Halite, less than 1% visible impurities |
| 939 - 939½ | 75 | NX - D.D. | Anhydrite, minor Clay and Halite |
| 939½ - 940 | 100 | NX - D.D. | Halite, less than 1% visible impurities |
| 940 - 940½ | 100 | NX - D.D. | Anhydrite and Clay, minor Halite |

# Stauffer Chemical Company Drill Logs

**Detrital Valley Salt Deposit (file) Mohave Co.**
**Red Lake Cavern (file) Mohave Co.**

Stauffer Chemical drilled 4 holes up to 3,000 feet deep during 1960-62. The holes are located in Nevada north of Detrital Valley across Lake Mead. The holes penetrate the Muddy Creek Formation evaporite sequence. The logs of the are of interest and relevant to the Detrital Valley Salt Deposit (file) and Red Lake Cavern (file). Copies are located in the Detrital Valley Salt file.

Nyal J. Niemuth
November 1994.

ERRATUM: Drill Log, Hole No. 8

The log of the section between 97 and 604 feet should read as follows:

| Feet From - To | Core Recovery, % | Bit Type & Size | Description and Remarks |
|---|---|---|---|
| 97 - 374 | — | 4 3/4" Rock | Conglomerate with sandstone lenses, not cored. |
| 374 - 604 | — | 4 3/4" Rock | Clay with Anhydrite and minor Gypsum. Halite at ±600'. Set 585' of 3" pipe as casing. |

Page 4. Drill Log - Hole No. 8

| Feet From - To | Core Recovery, % | Bit Type & Size | Description and Remarks |
|---|---|---|---|
| 940½ - 943 | 90 | NX - D.D. | Halite, ±50% Clay and Anhydrite |
| 943 - 944 | 100 | NX - D.D. | Anhydrite and Clay, minor Halite |
| 944 - 962 | 100 | NX - D.D. | Halite, ±20% Anhydrite and Clay |
| 962 - 970½ | 100 | NX - D.D. | Halite, less than 1% visible impurities |
| 970½ - 971 | 95 | NX - D.D. | Clay and Anhydrite, minor Halite |
| 971 - 972 | 100 | NX - D.D. | Halite, ±15% Clay and Anhydrite |
| 972 - 974 | 100 | NX - D.D. | Clay and Anhydrite, minor Halite |
| 974 - 980 | 100 | NX - D.D. | Halite, ±20% Clay and Anhydrite |
| 980 - 991 | 100 | NX - D.D. | Halite, ±15% Clay and minor Anhydrite |
| 991 - 997 | 100 | NX - D.D. | Halite, less than 5% Clay |
| 997 - 1003 | 95 | NX - D.D. | Halite, ±20% Clay and Anhydrite |
| 1003 - 1006 | 100 | NX - D.D. | Halite, ±15% Clay and minor Anhydrite |
| 1006 - 1022 | 100 | NX - D.D. | Halite, ±20% Clay and Anhydrite, 4" clay seam at 1013' |
| 1022 - 1025 | 90 | NX - D.D. | Halite, ±15% Clay and Anhydrite |
| 1025 - 1036 | 100 | NX - D.D. | Halite, ±20% Clay and Anhydrite |
| 1036 - 1039 | 100 | NX - D.D. | Halite, less than 1% visible impurities |
| 1039 - 1040 | 100 | NX - D.D. | Halite, ±50% Clay and Anhydrite |
| 1040 - 1042 | 100 | NX - D.D. | Clay, minor Anhydrite and Halite |
| 1042 - 1064 | 100 | NX - D.D. | Halite, ±20% Clay and Anhydrite |
| 1064 - 1066 | 100 | NX - D.D. | Halite, ±15% Clay and Anhydrite |

# DRILL LOG

## GOLDFIELD, DETRITAL VALLEY SALINE - HOLE NO. 9

Location: SE¼, SW¼ Section 11, Township 20N., Range 21W., Gila and Salt River Meridian

Elevation: 1781 Feet

Inclination: Vertical Depth: 956 Feet

Type of Drills: Failing 1500 Rotary and Boyles-Joy 22 Diamond Drill

Date Started: November 11, 1958 Date Completed: November 30, 1958

Logged by: William H. Hisle

| Feet From - To | Core Recovery % | Bit Type & Size | Description and Remarks |
|---|---|---|---|
| 0 - 86 | — | 6¼" Rock | Recent Valley Fill, unconsolidated, not cored, Set 5" pipe to 86'. |
| 86 - 296 | — | 4¾" Rock | Conglomerate with sandstone lenses, not cored. |
| 296 - 466 | — | 4¾" Rock | Clay with Anhydrite and minor Gypsum. |
| 466 - 476 | 40 | NX - D.D. | Clay, with Anhydrite and Halite. Set 462' of 3" pipe as casing. |
| 476 - 486 | 90 | NX - D.D. | Halite, ±15% Anhydrite and Clay |
| 486 - 488 | 90 | NX - D.D. | Halite, ±5% Clay |
| 488 - 516 | 92 | NX - D.D. | Halite, ±15% Anhydrite and Clay |
| 516 - 518½ | 90 | NX - D.D. | Halite, ±5% Clay |
| 518½ - 528½ | 95 | NX - D.D. | Halite, ±10% Clay and Anhydrite |
| 528½ - 535 | 95 | NX - D.D. | Halite, ±5% Clay |
| 535 - 536 | 95 | NX - D.D. | Halite, ±10% Clay, minor Anhydrite |
| 536 - 539 | 100 | NX - D.D. | Halite, ±20% Anhydrite and Clay |
| 539 - 544 | 100 | NX - D.D. | Halite, ±1% Clay |
| 544 - 546 | 100 | NX - D.D. | Halite, ±5% Clay |
| [illegible] - 556 | 100 | NX - D.D. | Halite, ±10% Anhydrite and Clay |

Page 2. Drill Log - Hole No. 9

| et From - To | Core Recovery % | Bit Type & Size | Description and Remarks |
|---|---|---|---|
| 556 - 566 | 100 | NX - D.D. | Halite, ±5% Clay, 3" Clay seam at 562' |
| 566 - 575 | 100 | NX - D.D. | Halite, ±15% Clay |
| 575 - 576 | 100 | NX - D.D. | Halite, ±30% Clay and Anhydrite |
| 576 - 584 | 100 | NX - D.D. | Halite, ±15% Clay and Anhydrite |
| 584 - 585 | 100 | NX - D.D. | Halite, ±40% Clay and Anhydrite |
| 585 - 586 | 100 | NX - D.D. | Halite, ±15% Clay and Anhydrite |
| 586 - 588 | 100 | NX - D.D. | Halite, ±10% Clay |
| 588 - 601 | 100 | NX - D.D. | Halite, ±5% Clay |
| 601 - 603 | 100 | NX - D.D. | Halite, ±1% visible impurities |
| 603 - 613 | 100 | NX - D.D. | Halite, ±10% Clay, 4" Clay seam at 603' |
| 613 - 623 | 100 | NX - D.D. | Halite, ±5% Clay |
| 623 - 626 | 100 | NX - D.D. | Halite, ±20% Anhydrite and Clay |
| 626 - 633 | 95 | NX - D.D. | Halite, ±20% Clay, minor Anhydrite |
| 633 - 662 | 100 | NX - D.D. | Halite, ±10% Clay |
| 662 - 665 | 100 | NX - D.D. | Halite, ±20% Clay and Anhydrite |
| 665 - 666 | 100 | NX - D.D. | Halite, ±30% Clay and Anhydrite |
| 666 - 671 | 100 | NX - D.D. | Halite, ±20% Clay, minor Anhydrite |
| 671 - 686 | 100 | NX - D.D. | Halite, ±15% Clay and Anhydrite |
| 686 - 697 | 100 | NX - D.D. | Halite, ±20% Clay and Anhydrite |
| 697 - 703 | 100 | NX - D.D. | Halite, ±10% Clay, minor Anhydrite |
| 703 - 713 | 100 | NX - D.D. | Halite, ±5% Clay |
| 713 - 724 | 100 | NX - D.D. | Halite, ±20% Clay and Anhydrite |
| 724 - 726 | 90 | NX - D.D. | Halite, ±50% Clay and Anhydrite |
| 72 - 723 | 90 | NX - D.D. | Halite, ±20% Clay and Anhydrite |

| Feet From - To | Core Recovery % | Bit Type & Size | Description and Remarks |
|---|---|---|---|
| 728 - 730½ | 100 | NX - D.D. | Halite, ±15% Clay, minor Anhydrite |
| 730½ - 733 | 100 | NX - D.D. | Halite, ±5% Clay |
| 733 - 737 | 100 | NX - D.D. | Halite, ±15% Clay and Anhydrite |
| 737 - 738 | 100 | NX - D.D. | Halite, ±5% Clay |
| 738 - 741 | 90 | NX - D.D. | Halite, ±10% Clay |
| 741 - 756 | 95 | NX - D.D. | Halite, ±5% Clay |
| 756 - 758 | 100 | NX - D.D. | Halite, ±10% Clay |
| 758 - 769 | 100 | NX - D.D. | Halite, ±20% Clay and Anhydrite |
| 769 - 774 | 100 | NX - D.D. | Halite, ±10% Clay |
| 774 - 776 | 100 | NX - D.D. | Halite, ±15% Clay and Anhydrite |
| 776 - 782½ | 85 | NX - D.D. | Halite, ±5% Clay |
| 78[illegible] - 783½ | 85 | NX - D.D. | Halite, ±10% Clay |
| 783½ - 788½ | 90 | NX - D.D. | Halite, ±5% Clay |
| 788½ - 792 | 100 | NX - D.D. | Halite, ±10% Clay |
| 792 - 799 | 95 | NX - D.D. | Halite, ±5% Clay |
| 799 - 800½ | 95 | NX - D.D. | Halite, ±10% Clay |
| 800½ - 801 | 95 | NX - D.D. | Halite, ±1% visible impurities |
| 801 - 805 | 95 | NX - D.D. | Halite, ±20% Clay and Anhydrite |
| 805 - 806 | 90 | NX - D.D. | Clay, ±30% Halite and Anhydrite |
| 806 - 808 | 100 | NX - D.D. | Halite, ±20% Anhydrite and Clay |
| 808 - 809 | 100 | NX - D.D. | Halite, ±10% Clay, minor Anhydrite |
| 809 - 815½ | 100 | NX - D.D. | Halite, ±20% Anhydrite and Clay<br>3" Clay seam at 809½' |
| 815½ - 816 | 90 | NX - D.D. | Halite, ±1% visible impurities,<br>2" Clay seam at 816' |

Page 4. Drill Log - Hole No. 9

| Feet From - To | Core Recovery % | Bit Type & Size | Description and Remarks |
|---|---|---|---|
| 816 - 817 | 95 | NX - D.D. | Halite, ±15% Clay |
| 817 - 818 | 95 | NX - D.D. | Halite, ±10% Clay |
| 818 - 819 | 95 | NX - D.D. | Halite, ±5% Clay |
| 819 - 820 | 90 | NX - D.D. | Halite, ±1% visible impurities |
| 820 - 822 | 95 | NX - D.D. | Halite, ±20% Anhydrite and Clay |
| 822 - 826 | 95 | NX - D.D. | Halite, ±15% Clay and Anhydrite 4" Clay seam at 824' |
| 826 - 830½ | 100 | NX - D.D. | Halite, ±20% Clay and Anhydrite |
| 830½ - 835 | 100 | NX - D.D. | Halite, ±5% Clay |
| 835 - 836 | 100 | NX - D.D. | Halite, ±10% Clay and Anhydrite |
| 836 - 839½ | 100 | NX - D.D. | Halite, ±20% Clay and Anhydrite |
| 839½ - 841 | 100 | NX - D.D. | Anhydrite, minor Clay and Halite |
| 8[illegible] - 846 | 100 | NX - D.D. | Halite, ±30% Anhydrite and Clay |
| 846 - 876 | 95 | NX - D.D. | Halite, ±20% Clay and Anhydrite |
| 876 - 881 | 95 | NX - D.D. | Halite, ±15% Clay and Anhydrite |
| 881 - 884 | 95 | NX - D.D. | Halite, ±10% Clay and Anhydrite |
| 884 - 887 | 95 | NX - D.D. | Halite, ±15% Clay and Anhydrite |
| 887 - 892 | 100 | NX - D.D. | Halite, ±10% Clay and Anhydrite |
| 892 - 899 | 100 | NX - D.D. | Halite, ±20% Clay and Anhydrite |
| 899 - 902 | 100 | NX - D.D. | Halite, ±10% Clay and Anhydrite |
| 902 - 909½ | 100 | NX - D.D. | Halite, ±15% Clay and Anhydrite 4" Clay seam at 906' |
| 909½ - 912 | 95 | NX - D.D. | Halite, ±10% Clay and Anhydrite |
| 912 - 926 | 100 | NX - D.D. | Halite, ±15% Clay and Anhydrite |
| 926 - 930 | 95 | NX - D.D. | Halite, ±20% Clay and Anhydrite |

Page 5. Drill Log - Hole No. 9

| Feet From - To | Core Recovery % | Bit Type & Size | Description and Remarks |
|---|---|---|---|
| 930 - 946 | 95 | NX - D.D. | Halite, ±15% Clay and Anhydrite 4" Clay seam at 944' |
| 946 - 956 | 15 | NX - D.D. | Halite ± 5% Clay |

480'
Impure halite

956
476
480

# DRILL LOG

## GOLDFIELD, DETRITAL VALLEY SALINE - HOLE NO. 10

Location: SE¼, NE¼ Section 9, Township 29N., Range 21W., Gila and Salt River Meridian

Elevation: ±2090 Feet

Inclination: Vertical

Depth: 435 Feet

Type of Drill: Boyles-Joy 22 Diamond Drill

Date Started: December 2, 1958

Date Completed: December 9, 1958

Logged by: William H. Hisle

| Feet From - To | Bit Type & Size | Description and Remarks |
|---|---|---|
| 0 - 2 | 6¼" Rock | Unconsolidated and weathered conglomerate. |
| 2 - 50 | 6¼" Rock | Conglomerate with sandstone lenses, 5 inch pipe to 21 feet. |
| 50 - 168 | 4¾" Rock | Clay with numerous sandy seams. Drill water lost on numerous occasion - considerable drill mud required to hold water. |
| 168 - 405 | 4¾" Rock | Sandstone |
| 405 - 435 | 4¾" Rock | Sandstone well cemented grading to quartzite. |

See ? D - [illegible]

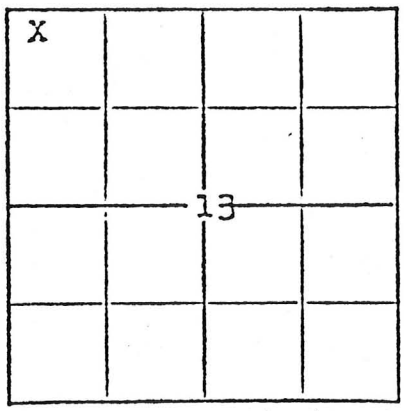
00863

9-1147

Budget Bureau No. 42-R352.3
Approval expires Dec. 31, 1957

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

U.S. Land Office Phoenix
Serial Number 016975
Date effective 12/9/57




Locate hole correctly, giving distance in feet from N. or S. and E. or W. line of section; when hole is not vertical, give direction and angle.

# LOG OF PROSPECT BORE HOLE

Logs of prospect bore holes are to be transmitted in duplicate to the Regional Mining Supervisor immediately upon completion of hole or shaft, or when work has been suspended indefinitely.

Lessee or permittee The Goldfield Consolidated Mines Compa
Address One Montgomery St., San Francisco 4, California
Driller Boyles Bros. Drilling Co.
Commenced drilling 2/18/59 Finished 3/5/59
Hole No. 12 Sec. 13 T. 30N. R. 21W. M. G&SR State Arizona
Method of drilling Portadrill, Joy 22 Diamond Drill Logged by A. R. Smith

The information given herewith is a complete and correct record of the bore hole and all work done thereon, so far as can be determined from all available records.

(Signed) Robert R. Mott

Date April 7, 1959 (Title) Consulting Geologist

The United States Criminal Code, 18 U. S. C. 1001 makes it a criminal offense to make a willfully false statement or representation to any Department or Agency of the United States as to any matter within its jurisdiction.

Elevation of top of hole relative to sea level 1700 ±

FORMATION RECORD

| DEPTH From Feet | Inches | DEPTH To Feet | Inches | Thickness of stratum Feet | Inches | Geologic formations; character of rock; oil, gas and water horizons; coal and other mineral occurrences |
|---|---|---|---|---|---|---|
| 0 | | 19 | | 19 | | Recent alluvial gravel - granitic, unconsolidated, pebble-cobble size. |
| 19 | | 48 | | 29 | | Clay- red brown, unconsolidated, local sandy lenses |
| 48 | | 91 | | 43 | | Claystone- green-gray, weakly indurated, minor gypsum |
| 91 | | 295 | | 204 | | Clay, brownish-gray, unconsolidated; interbedded with minor amounts of gray siltstone. |
| 295 | | 418 | | 123 | | Claystone- gray-brown, weakly indurated; interbedded with light brown claystone and gypsum (<3% by vol.) |
| 418 | | 460 | | 42 | | Interbedded anhydrite, claystone, and gypsum; in that order of abundance. |
| | | | | | | (Began 1¾" wire line at 541') |
| 460 | | 561 | | 101 | | Siltstone- light brown, moderately indurated; disseminated patches & lenses (<1" max. width) of anhydrite & gypsum. Locally massive gypsum and volcanic ash beds, from 0.3" to 1.5" wide. |
| 561 | | 570 | | 9 | | Anhydrite- massive, gray to brownish with 20 - 40% silt and clay. |
| 570 | | 609 | | 39 | | Claystone, light brown, silty; interbedded with anhydrite and gypsum. |
| 609 | | 662 | 5 | 53 | 5 | Anhydrite, gypsum, siltstone; massive anhydrite zones range to 6' in maximum thickness. |
| 662 | 5 | 696 | 5 | 34 | | Diorite |

(Attach continuation sheets if necessary)

GPO 905349

See P D - 4 all Nos

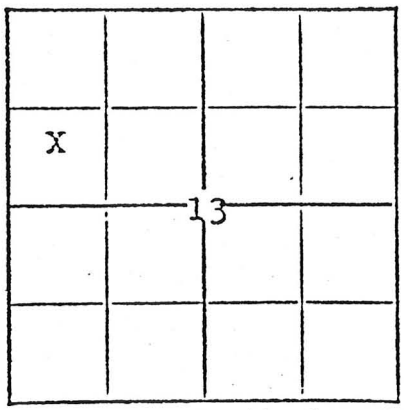
00864

9-1147

Budget Bureau No. 42-R352.3
Approval expires Dec. 31, 1957

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

U.S. Land Office Phoenix
Serial Number 015975
Date effective 12/9/57




Locate hole correctly, giving distance in feet from N. or S. and E. or W. line of section; when hole is not vertical, give direction and angle.

# LOG OF PROSPECT BORE HOLE

Logs of prospect bore holes are to be transmitted in duplicate to the Regional Mining Supervisor immediately upon completion of hole or shaft, or when work has been suspended indefinitely.

Lessee or permittee The Goldfield Consolidated Mines Company
Address One Montgomery Street, San Francisco 4, Calif.
Driller Boyles Bros. Drilling Co.
Commenced drilling 3/6/59 Finished 3/27/59
Hole No. 13 Sec. 13 T. 30 N. R. 21 W. M. G&SR State Arizona
Method of drilling Porta drill Logged by A. R. Smith

The information given herewith is a complete and correct record of the bore hole and all work done thereon, so far as can be determined from all available records.

(Signed) Robert L. Witt

Date April 7, 1959 (Title) Consulting Geologist

The United States Criminal Code, 18 U. S. C. 1001 makes it a criminal offense to make a willfully false statement or representation to any Department or Agency of the United States as to any matter within its jurisdiction.

Elevation of top of hole relative to sea level 1760 ±

FORMATION RECORD

| DEPTH From— Feet Inches | DEPTH To— Feet Inches | Thickness of stratum Feet Inches | Geologic formations; character of rock; oil, gas and water horizons; coal and other mineral occurrences |
|---|---|---|---|
| 0 | 12 | 12 | Recent Alluvial gravel - granitic, unconsolidated, pebble-cobble size. |
| 12 | 132 | 120 | Clay, Red brown, unconsolidated; minor amount of gravel lenses. |
| 132 | 245 | 113 | Clay - Predominately dark brownish - gray, unconsolidated. |
| 245 | 435 | 190 | Claystone - red brown and dark brownish gray, weak indurated; interbedded with a minor amount of gray siltstone and unconsolidated clay. |
| 435 | 490 | 55 | Gypsum and anhydrite, interbedded with volcanic ash and dark-brownish-gray claystone. |
| 490 | 640 | 150 | Claystone - light brown, weakly indurated; minor amounts of interbedded anhydrite and gypsum. |
| 640 | 653 | 13 | Anhydrite and gypsum |
| 653 | 733 | 80 | Claystone - brown, weakly indurated; interbedded with 10 to 20% gypsum and anhydrite. |
| 733 | 751 | 18 | Diorite |

(Attach continuation sheets if necessary)

GPO 905349

9-1147

00865

See PD Hole No. 3

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Budget Bureau No. 42-R352.3
Approval expires Dec. 31, 1957

U.S. Land Office Phoenix
Serial Number 016975
Date effective 12/9/57

| | | | |
|---|---|---|---|
| | | | X |
| | | | |
| | 12 | | |
| | | | |

Locate hole correctly, giving distance in feet from N. or S. and E. or W. line of section; when hole is not vertical, give direction and angle.

# LOG OF PROSPECT BORE HOLE

Logs of prospect bore holes are to be transmitted in duplicate to the Regional Mining Supervisor immediately upon completion of hole or shaft, or when work has been suspended indefinitely.

Lessee or permittee The Goldfield Consolidated MinesCompan
Address One Montgomery St., San Francisco 4, Californi
Driller Boyles Bros. Drilling Co.
Commenced drilling 3/18/59 Finished 3/21/59
Hole No. 14 Sec. 12 T. 30N R. 21W M. GSR State Arizon
Method of drilling Porta drill Logged by A. R. Smith

The information given herewith is a complete and correct record of the bore hole and all work done thereon, so far as can be determined from all available records.

(Signed) Robert R. Watt

Date April 7, 1959 (Title) Consulting Geologist

The United States Criminal Code, 18 U. S. C. 1001 makes it a criminal offense to make a willfully false statement or representation to any Department or Agency of the United States as to any matter within its jurisdiction.

Elevation of top of hole relative to sea level 1500 ±

FORMATION RECORD

| DEPTH From— Feet | Inches | DEPTH To— Feet | Inches | Thickness of stratum Feet | Inches | Geologic formations; character of rock; oil, gas and water horizons; coal and other mineral occurrences |
|---|---|---|---|---|---|---|
| 0 | | 10 | | 10 | | Recent alluvial gravel-granitic, unconsolidated. |
| 10 | | 45 | | 35 | | Clay- red-brown, unconsolidated; minor gravel and sand lenses. |
| 45 | | 55 | | 10 | | Sandstone- brownish-gray, moderately indurated, v. fine grained. |
| | | | | | | (No water circulation below 72') |
| 55 | | 165 | | 115 | | Clay- unconsolidated, red brown; interbedded with gravel lenses. |
| 165 | | 185 | | 20 | | Claystone- (thought to be such from the rate of drilling) |

(Attach continuation sheets if necessary)

GPO 905343

Mannison, L.E., 1963, Virgin Valley salt deposits, Clark County, Nevada, in Symposium on salt: Northern Ohio Geological Society

Reference: ABM Bull. 180, p.379

June 23, 1960

Mr. D.R.H. Mahoney
11910 Laurie Lane
Houston, 24, Texas

COPY

Dear Mr. Mahoney:

In regard to your inquiry of June 20th about the geology, production and consumption of NaCl in Arizona:

As of September, 1959, Goldfield Consolidated (now merged into American Chrome Company) had drilled extensive halite beds in tha Detrital Wash area near Bonnelli's Landing opposite the mouth of the Virgin River at Lake Mead. A halite thickness exceeding 500 feet reportedly was drilled. A pilot plant had been constructed. Work had been discontinued through the summer, and our field engineer found no sign of recent activity when in the area in March of this year.

Other parties reportedly are interested in the playa beds of this area.

The enclosed photocopy of a 1928 article by J. H. MacClintock covers other areas from which no recent production is known to us.

Other references are:

Phalen, W. C., Salt Resources of the U.S., U.S.G.S Bull. 669, 1919

Young, G. J. Prehistoric mining for rock salt at Camp Verde: Eng.Min.Jour., vol 124, p. 18, 1927.

Consumption in Arizona has increased with the recent commencement of a plant using a salt-coke segregation process for extraction of copper from oxide ores. Another development is a planned pulp mill to be built by the largest lumber company in Arizona. 1958 shipments of evaporated and rock salt from U. S. producers to Arizona were 14,000 and 13,000 short tons respectively.

If we can be of further service, please do not hesitate to call on us.

Yours very truly,

Enc
FK:lp

FRANK P. KNIGHT,
Director.

# DEPARTMENT OF MINERAL RESOURCES

STATE OF ARIZONA

**FIELD ENGINEERS REPORT**

Mine: Salt Deposits — Date: July 16, 1959

District: Gold Basin, Mohave County — Engineer: Travis P. Lane

Subject: Information obtained in Kingman

I visited Mr. Bert Coleman, Mgr. of the Mohave County Chamber of Commerce in Kingman on July 8th concerning possible miner-cattleman conflict of interest on grazing ranges; and at the same time I inquired re the salt deposit exploration being conducted by Goldfield Consolidated Mining Co. in the region near Temple Bar. Mr. Coleman said that he had visited the area following receipt of a letter addressed to the Chamber of Commerce by Mr. H. Hisle of Goldfield Consolidated Mining Co. He showed me the letter, dated Feb. 2, 1959, and I summarized it as follows:

Goldfield Consolidated Mining Co. is a Wyoming Corporation with offices at :

No. 1 Montgomery St., San Francisco, Calif. and 206 N. Virginia St., Reno, Nevada

Property: Early in 1957 the Company obtained a lease on 34 sections (15,360 acres) of potential salt bearing ground. The leasing agency was the Lake Mead National Recreation Area administered by the National Park Service. The center of the area is approximately 55 miles southeasterly from Boulder City -- 40 miles on Highway 93 and then 15 miles on the Temple Bar road. It is about the same distance northerly from Kingman.

To date 11 holes have been drilled for a total footage of 10,800 feet. 8 of the holes have partially delimited a salt deposit of high purity with length of 3 miles, width of at least 1 mile and an assured thickness of 500 feet. Additional drilling is planned. Salt recovery by brining and solar evaporation is proposed.

The letter stated that a market for 400 to 500 TPD exists at Henderson, Nevada, with Stauffer Chemical Co. accounting for the bulk of this use. That Company presently has a long term contract with the Leslie Salt Co. of Calif. to supply its needs. The letter also spoke of 2 firms having prospective plans for plants near Henderson to produce perchlorates for use in solid fuels. Also, the Hooker Electro-Chemical is reported to be considering the construction of a large chlorine plant in the Salt Lake City area.

The purpose of the letter was to apprise the Chamber of Commerce of the Company's favorable opinion as to the long range outlook for a regional salt industry and to enlist the Chamber's support in publicizing the advantages for plants, such as Hooker Electro-Chemical proposes, to locate near Boulder City because this location would be not far distant from large users on the west coast. Cheap Hoover dam power was cited as another attraction.

Mr. Coleman said he understood that Phelps Dodge was associated with Goldfield in the venture but said he could not vouch for the authenticity of this information.

DETRITAL WASH SALT DEPOSITS MOHAVE COUNTY

GOLDFIELD CONSOLIDATED MINES CO. (Wyoming Corp.)
W. A. Swan, V. Pres.
206 N. Virginia St., and No. 1 Montgomery St.
Reno, Nevada San Francisco, Calif.

W. A. Swan, also V. Pres. AMERICAN CHROME CO., Nye, Mont.
John L. Lukens, Treas. " "

4-22-58 - FPK

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Ariz. Legis. Rev. 11/10/76

SALT DEPOSITS +

MOHAVE COUNTY

**Thursday:** Visited Detrital Wash area near Bonnelli's Landing. Goldfield Consolidated has drilled salt beds here and has constructed a pilot evaporative plant which includes vats and pumping system -- pumping water into a drill hole and returning brine to 6 evaporation vats. No one was present at the time of visit. I drove on to the Temple Bar ranger station where I interviewed Mr. Sutherland, the ranger. He described the work of Goldfield Consolidated and said work was suspended at the beginning of summer and was expected to resume about now. Mr. Heisel directed the work for the company. T.P.LANE - WR - 9-28-59

The merger of Goldfield Consolidated Mines Company and American Chrome Company has been approved by stockholders. Two shares of Goldfield stock will be exchanged for each share of American Chrome.

Taken from MINING WORLD, January, 1960, p 68

SALT DEPOSITS

MOHAVE COUNTY
GOLD BASIN DISTRICT

Visited site of the Goldfield Consolidated salt project in Detrital Wash near Temple Bar on Lake Mead. There has been no recent company activity.

Visited Mr. Sutherland, the ranger stationed at Temple Bar. He reported that he had just received notice from the Park Service of an application for a sodium lease in Detrital Wash entered by a Mr. L. P. Corbin, Jr. The new lease application appears to overlap in some places the ground of the Goldfield Consolidated lease hold.

T. P. LANE - WR-3-19-60

Mr. W. H. Hisle was in relative to the salt well drilling his company, the Goldfield Consolidated Mines Company (American Chrome Co. of Montana). They have drilled 7 holes in the halite area at a place 7 miles south of Bonelli Landing, northwestern Mohave County. Their plans are for utilization of the deposit ore, as yet, are tenative dependent upon the selection of a proper mining method.

LEWIS A. SMITH-WR 4-4-58

Mr.W.H.Hisle, engineer in charge of Gold Field Consolidated Mines (American Chrome Co. of Montana) report that 7 holes had been drilled in the salt beds in northern Mohave County, 10 miles from Healey Landing, south. They have sunk 7 holes and disclosed 500 feet of halite with about500 feet of overburden. The area drilled covers about 3 miles long by one mile wide. He was in to confer on salt markets and the best mining method. They plan to develop and ship salt to the chemical plant near Las Vegas. He will submit a Mine Owner's Report later.

LEWIS A. SMITH - WR - 4-5-58

KINGMAN, ARIZONA - Phelps Dodge Corporation is drilling for borax on Goldfield Consolidated Mines Company's Detrital Valley Saline project.

Taken from MINING WORLD,May 1959, p 31

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See Article MINING WORLD, June, 1959, p 73