UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
~~WASHINGTON 25, D.C.~~
College Park, Maryland

Department of the Interior
Defense Minerals Administration
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AUG 2 - 1954

July 28, 1954

Memorandum

To: George C. Selfridge, Chairman, Operating Committee, DMEA

From: W. T. Millar, Executive Officer, DMEA Field Team, Region VIII

Subject: Docket No. DMEA-2248 - (Fluorspar-Zinc-Lead)
Ozark-Mahoning Company
Hill-Ledford Tract, Hardin County, Illinois
Contract No. Idm-E255 (Amendment)

Transmitted herewith are the original and three copies of the Final Report on Exploration under Amendment to Contract No. Idm-E255. Also enclosed are drill logs for the entire project, including some drilling for the company account.

W. T. Millar

W. T. Millar

Enclosures

Reviewed by
DMEA OPERATING COMMITTEE
8-6-54
(date)

AUG 2 - 1954

FINAL REPORT ON EXPLORATION UNDER AMENDMENT TO CONTRACT

DMEA Docket No. 2248 - (Fluorspar-Zinc-Lead)

Contract No. Idm-E255, Amendment

Ozark-Mahoning Company, Mahoning Mining Division
Hill-Ledford Tract, Hardin County, Illinois

by

Defense Minerals Exploration Administration
Field Team, Region VIII

July 27, 1954

Reviewed by
DMEA OPERATING COMMITTEE
8-6-54
(date)

FINAL REPORT ON EXPLORATION UNDER AMENDMENT TO CONTRACT

DMEA Docket No. 2248 - (Fluorspar-Zinc-Lead)
Operator: Ozark-Mahoning Company, Mahoning Mining Division, Rosiclare, Illinois
Property: Hill-Ledford Tract
Hardin County, Illinois
Contract No. Idm-E255, Amendment

By: G. L. Neumann of the Bureau of Mines and
R. D. Trace of the U. S. Geological Survey

Summary

The purpose of this amendment to Contract Idm-E255 was to explore for an extension to the northeast of the area drilled and certified as a discovery on the southwest portion of the Hill-Ledford Tract, and thus further enhance the reserves of strategic fluorspar, zinc and lead. ?

Eleven churn drill holes were drilled for a total of 9,678 feet of the 25,000 feet allowed under the contract. Neither formational breaks nor any mineral values were cut in this drilling. The Operator decided that no minable extension to the northeast nor any northwest cross fault, as evidenced by a series of sink holes, existed, and that further drilling in this area was not warranted. The Operator requested an amendment to the contract, authorizing the use of the balance of the allowable footage to test for a south southwest spur extending from the discovery deposit in the vicinity of the badly shattered zone indicated by drill hole 42-M. The amendment was denied. The Operator has now drilled 2 holes along this trend for the Company's account and both have cut a good fluorspar ore zone. A third hole is now being drilled.

Conclusions

From the negative showing in the eleven holes drilled, the Field Team concurred with the Operator on the termination of this exploration before completion. The Field Team concluded that since the discovery deposit is to be mined, ?

ore reserves ?

the possible south southwest spur could be explored more advantageously from the underground workings than by drilling from the surface. The Field Team does not think that the existence of a spur off the discovery deposit at the indicated position would influence the selection of a shaft site or the underground development program to any marked degree.

Since the original contract was certified as a discovery and this stage of the work was written as an amendment, the Government is entitled to receive royalty payments for the amount of the Government's participation in the total project.

Recommendations

The Field Team recommends that this exploration under the amendment to the contract be terminated before completion and that Government's funds expended during exploration under the amended contract be repayed on a royalty basis on production from the discovery deposit.

Description of the Work Completed

All work was composed of churn drilling by an independent contractor on a unit cost basis. Churn drilling on Stage II was started on August 1, 1953 and terminated on March 10, 1954. Holes 49-M, 45-M, 43-M and 47-M were on a northwest-southeast cross section to check the northeasterly extension of the main trend. Holes 44-M, 48-M, 52-M and 53-M combine with Holes 26-M and 29-M drilled under Stage I of the contract and Hole 2 which was drilled several years ago by the Minerva Oil Company, to form an east-west cross section, to check the northeastern extension of the main trend. Holes 46-M, 49-M, 50-M and 51-M made another east-west cross section to check a possible northwest-southeast trending cross fault.

In the drilling of these three cross sections the same formations and potential ore horizons were cut at approximately the same depths as in the

drilling under Stage I. No breaks in these formations were indicated and only small stringers of fluorspar, lead or zinc were cut. The negative results obtained therefrom, precludes any sizeable extension to the northeast of the ore body indicated by the churn drilling under Stage I of the contract. A possible northwest-southeast trending cross fault indicated by a series of sink holes is also excluded by the results of this drilling. The contract was amended to extend the time limit from February 18, 1954 to June 30, 1954. Logs of these holes are in the Appendix of this report.

Holes 54-M and 55-M, located south of Hole 42-M drilled in Stage I, have been completed on Company account. Both of these holes cut fluorite of good grade. Hole 56-M, located to the south of 55-M, is now being drilled.

Geology

The ore deposits of the general area are the bedded replacement type in Mississippian rocks. The principle ore mineral is fluorite with subordinate quantities of sphalerite and galena. Drilling started in the upper Chester formations and penetrated the ore horizons, Bethel, Rosiclare and the sub-Rosiclare, at approximately the same depths as the drilling under Stage I. Although this drilling was along the trend of the major bedded fluorspar deposits of the area, and just northeast of a large body of ore, no indication of mineralized ground was found.

Expenditures

		Stage I	Stage II	Total Project
Total approved	-	$61,965.00	$60,750.00	$122,715.00
Total cost of project	-	61,965.00	23,517.54	85,482.54
Government's share of cost	-	30,982.50	11,758.77	42,741.27
Government's share unexpended	-	---	18,616.23	18,616.23

Value of production during operations - None

Efficiency of Operations

The work on Stage II was performed with the same high degree of efficiency, which has been witnessed on all work by the Operator. Ozark-Mahoning Company and the Mahoning Mining Division in particular, is a well staffed, highly competent organization. Progress reports and vouchers have been accurate and adequate. The Operator cooperated fully with Field Teams and examining engineers.

Equipment Purchased for Project

No equipment was purchased for this project.

W. T. Millar, Executive Officer
Bureau-Survey Field Team
Defense Minerals Exploration
Administration, Region VIII

(For) Quentin D. Singewald, U. S. Geological
Survey Member, Bureau-Survey Field Team
Defense Minerals Exploration
Administration, Region VIII

College Park, Md.
July 27, 1954

Final Report

Docket No. DMEA-2248

Contract No. Idm-E255 - (Stage II)
Operator - Ozark-Mahoning Company
Mahoning Mining Division
Rosiclare, Illinois

Property - Hill-Ledford Tract
Hardin County, Illinois

(Fluorspar-Zinc-Lead)

APPENDIX

CHURN DRILL HOLE LOGS

Holes 43-M to 53-M (inclusive)

Reviewed by
DMEA OPERATING COMMITTEE
8-6-54
(date)

C O P Y

OZARK-MAHONING COMPANY

Hill-Ledford Tract
Hole No. 43-M
Elevation: 435.00

Started 8-1-53
Completed 8-28-53
Water 55 - 60 ft.
115 - 120 ft.
675 ft.
Stands at 75 ft.
No strong water

Location: 1350' N. 388' E. of S.W. Cor., of S.E.¼ of N.W.¼ of Sec. 24, Twp., 11 S., Range 9 E., Hardin County, Ill., or

522' N. - 659' E. of 29 M.

Examined by: A. G. Johnson
Casing 30 ft.

0 - 30	Soil, clay and boulders
30 - 40	Shale
40 - 90	Dark colored shaly lime - shaly partings. Menard
90 - 141	White sand - shaly layers
141 - 155	Had light gray and brownish-looking lime. Vienna.
155 - 185	Coarse gray and white sand - shaly streaks.
185 - 215	Coarse white sand - few shale seams.
215 - 235	White sand - shaly sand streaks. Base of Tar Springs
235 - 300	Light gray to gray lime
300 - 310	Dark colored shaly lime. Base of Glenn Dean.
310 - 360	Hardinsburg sandstone
360 - 395	Light gray lime - some gouge and selvage
395 - 430	Light gray to dark gray shaly lime - mud streaks
430 - 445	Chocolate colored shale
445 - 540	Dark colored shaly lime - mud pockets, sandy shale - Base of Golconda at 540 ft.
540 - 565	Gray sand - shale seams
565 - 650	White and gray sand
650 - 690	Shelly white and gray sand. Break at 675 ft. Trace of calcite.
690 - 730	White sand. Few Zn shs., Trace pyrite. Formation hard. B. Bethel at 730 ft.

730 - 755	Gray lime.
755 - 760	Green and reddish-looking shale and selvage, some lime.
760 - 775	Gray lime, some selvage.
775 - 795	Dark colored shaly lime.
795 - 810	Gray lime - lower O'Hara.
810 - 830	Green and reddish-looking Rosiclare sand.
830 - 832½	Gray and pink-grained lime - some sand. Base of Rosiclare 832 ft.
832½ - 865	Gray lime.
865 - 895	Gray to brown lime.
895 - 900	Light colored lime, trace of reddish-looking sand - Sub Rosiclare horizon.
900 - 905	Light gray lime.

C O P Y

OZARK-MAHONING COMPANY

Hill-Ledford Tract
Hole No. 44-M
Elev. 386.3
Location: 840' W., of S.W. Cor. of S.E.¼ N.W.¼ of Sec. 24, Twp.,11, R. 9, Hardin County, Illinois
or
148' East of 29-M
Drilled by: Moreland and Hohler
Examined by: A. G. Johnson
Casing 38 ft. 6¼"

Started 8-24-53
Completed 10-1-53
Water: 30 ft.
90 ft.
215 ft.
310 ft.
345 ft.
415 ft.
425 ft.
455 ft.
540 ft.
720 ft.
Hole full - no open ground

0 - 7	Soil and clay
7 - 25	Quick sand
25 - 35	Shale - sand - creek gravel
35 - 60	Mostly shale
60 - 70	Dark colored lime - shale - con. pyrite
70 -105	Shaly sandstone
105 -125	Gray sand
125 -135	Shaly gray sand
135 -155	White Lime
155 -210	Dark colored shaly lime, shale streaks. Base of Glenn Dean 210 ft.
210 -275	Hardinburg sandstone - shaly streaks.
275 -305	Dark colored shaly lime
305 -320	Brown sandy shale - some dark colored lime
320 -340	Dark colored shaly lime - shale streaks
340 -355	Chocolate colored shale
355 -390	Mostly sandy shale
390 -405	Dark colored shaly lime - some shale
405 -455	Sandy shale - lt. lime
455 -530	Hard white sand
530 -605	Shelly gray sand

605 - 638	Hard white sand. Few Zn shs. B.B. 638 ft.
638 - 650	Gray lime
650 - 670	Gray lime, some calcite
670 - 685	Dark colored lime, some selvage
685 - 705	Dark colored lime,(shaly)
705 - 720	Lighter colored lime
720 - 740	Rosiclare sand
720 - 750	Light gray lime
750 - 765	do do , selvage seams
765 - 795	Gray to brown lime
795 - 800	Brown lime
800 - 815	White lime. Few Zn shs.

C O P Y

OZARK-MAHONING COMPANY

Hill-Ledford Tract
Hole No. 45-M
Elev. 413.9
Location: 1546' N. 204' E. of S.W. Cor., of S.E. ¼ of NW ¼ of Sec. 24, Twp., 11 S., R. 9 E., Hardin County, Illinois
or
196' N. 184' W. of 43-M
Drilled by: Moreland and Hohler
Examined by: A. G. Johnson
Casing - 11 ft. 8" size

Started 8-24-53
Completed 9-30-53
Water 50 - 55 ft.
765 - 770 ft. weak
Stands at 23 ft.

0 - 15	Soil, clay and lime boulders.
15 - 65	Dark colored shaly lime - shale and selvage seams
65 - 85	Shale - some dark colored lime. Base of Menard 85 ft.
85 - 95	Sandy shale
95 - 135	Shaly gray sand - sandy shale
135 - 150	Sandy shale - gray lime. Vienna Ls.
150 - 170	Shaly sand
170 - 225	White and gray sand
225 - 240	Gray sand - shale seams. Base of Tar Spgs., 240 ft.
240 - 300	White and gray lime - few shale seams
300 - 310	Dark colored sandy lime, some shale. Base Glenn Dean 310 ft.
310 - 330	Gray sand - shaly
330 - 360	Gray sand. Base of Hardinsburg 360 ft.
360 - 395	Gray and dark colored shaly lime
395 - 405	Mostly sandy shale [illegible]
405 - 430	Gray and dark colored shaly lime
430 - 445	Dark colored shaly lime
445 - 485	Mostly sandy shale and selvage
485 - 510	Dark colored shaly lime - shaly
510-535	Sandy shale
535 - 540	White sand, some shale

535 - 540	White sand, some shale
540 - 560	White sand
560 - 570	Gray sand - shaly
570 - 660	White sand
660 - 700	Shelly gray sand
700 - 725	Hard white sand. B.B. 725 ft.
725 - 745	Gray lime
745 - 775	Gray lime, lt. selvage. Tight.
775 - 790	Dark colored shaly lime
790 - 805	Gray to tan colored lime
805 - 828	Green and reddish looking Rosiclare sand
828 - 840	Light gray lime
840 - 865	Gray lime - few selvage seams
865 - 895	Gray to brown lime
895 - 900	White lime

C O P Y

OZARK-MAHONING COMPANY

Hill-Ledford Tract

Started: 8-28-53
Completed: 10-6-53

Hole No. 46-M
Elevation: 439.00
Location: 1742 ft. N. 180 ft. E. of S.W. Corner of S.E. ¼ of N.W. ¼ of Sec. 24, Twp. 11 S., Range 9 E., Hardin County, Illinois
or
196 ft. N. 24 ft. W. of 45-M

Water: 70 - 75 ft.
220 - 225 ft.
Stands 80 ft.

Drilled by: B. W. Bales
Examined by: A. G. Johnsom
Casing: 44 ft. - 6¼"

0 - 25	Soil, clay and lime boulders
25 - 60	Dark colored shaly lime
60 - 75	Shale and selvage - lime streaks
75 - 120	Dark colored lime - shaly streaks - Base of Menard 120 ft.
120 - 175	Shaly sand - shale
175 - 190	Light gray lime - some shale. Vienna Ls.
190 - 200	Sandy shale
200 - 250	Gray sand - few shale partings
250 - 265	do , more shale
265 - 270	Gray sand - lt. white lime. Base Tar Springs 270 ft.
270 - 285	White lime
285 - 327	Gray to dark gray lime, shale and gouge streaks. Base of Glenn Dean 327ft
327 - 345	Shaly gray sand
345 - 360	Shale, selvage and mud, gray sand
360 - 395	Gray sand. Base of Hardinburg 395 ft.
395 - 430	Light gray and some dark colored shaly lime.
430 - 445	Dark colored shaly lime
445 - 465	Light gray and dark colofed shaly lime
465 - 480	Chocolate colored shale
480 - 500	Sandy shale

500 - 520	Shale selvage and mud, some dark colored shaly lime
520 - 565	Light gray and dark colored shaly lime
565 - 570	Sandy shale, heavy pyrite. Base of Golconda 570 ft.
570 - 610	Gray sand - shale seams
610 - 655	White sand
655 - 710	Shelly white and gray sand
710 - 759	White sand. Base of Bethel 759 ft.
759 - 785	Gray lime
785 - 820	do , some selvage
820 - 830	Dark colored shaly lime
830 - 840	Light gray lime
840 - 862	Rosiclare sand
862 - 875	Light gray lime
875 - 905	Gray lime
905 - 925	Brown colitic lime
925 - 940	Light colored lime

C O P Y

OZARK-MAHONING COMPANY

Hill-Ledford Tract
Hole No. 47-M
Elevation: 467.7
Location: 1346' N. 684' E. of S.W. Cor. of S.E.¼ of N.W. ¼ of Sec. 24, Twp. 11 S., R. 9E., Hardin County, Illinois
or
296' E. 4' S. of 43-M

Started 9-30-53
Completed 11-5-53

Water: 175 - 180' light
625 - 630' light
Stands 400 ft.

Drilled by: Moreland & Hohler
Examined by: A. G. Johnson
Casing: 28 ft. 6¼"

0 - 28	Soil, clay and boulders
28 - 70	Dark colored lime
70 - 80	do do do , selvage
80 - 130	Dark colored shaly lime. B. Menard 130 ft.
130 - 180	Shaly sand - shale and selvage streaks
180 - 195	Vienna lime
195 - 210	Shaly sandstone
210 - 225	Selvage
225 - 250	White and gray sand - shale seams
250 - 265	Gray sand - shale. Base of Tar Springs 265 ft.
265 - 310	White and gray lime
310 - 330	Gray and dark colored shaly lime
330 - 345	Sandy shale - some sand and dark colored shaly lime. Base of Glenn Dean 345 ft.
345 - 395	Hardinburg S.S. Some shale near base
395 - 440	Gray and dark colored shaly lime
440 - 460	Black shaly lime
460 - 465	Shale - some lime
465 - 475	Chocolate colored shale
475 - 535	Shale
535 - 545	Shale - some dark colored lime and sand Base of Golconda 545 or possibly 575 ft.

545 - 575	Mostly sandy shale
575 - 585	Gray sand - shale
585 - 685	Hard white sand
685 - 763	White sand. B.B. 763'
763 - 790	Gray lime
790 - 810	Gray lime - selvage
810 - 838	Dark colored lime - very little shale
838 - 860	Rosiclare sand - Greenish and reddish looking
860 - 875	Gray lime
875 - 885	do do , trace of selvage
885 - 895	do do
895 - 923	Gray to brown lime
923 - 935	White lime

C O P Y

OZARK-MAHONING COMPANY

Hill-Ledford Tract
Hole No. 48-M
Elevation 383.8
Location: 835' N., 102' E., of S.W. Cor., of S.E.¼ of N.W.¼ of Sec. 24, Twp. 11, R. 9, Hardin County, Illinois
or
202' E. 5' S. of 44-M

Started 10-1-53
Completed 11-2-53
Water 55' light
75)
195)
345)
410) Settled cutgs.
485)
550)
665)

Drilled by: Moreland and Hohler
Examined by: A. C. Johnson
Casing - 40' - 6-1/4"

Stands 50 feet

0 - 20	Soil, Clay and boulders
20 - 45	Selvage, shale and sandstone
45 - 55	Sandy shale, some dark colored lime
55 - 65	Hard gray and brown lime. Vienna
65 - 100	Gray sand - sandy shale
100 - 125	White sand
125 - 140	Sandy shale. Base of Tar Spgs. 140 ft.
140 - 175	White and light gray lime
175 - 200	Gray lime - shale seams. Base Glenn Dean 200 ft.
200 - 205	Sandy shale
205 - 270	Hardinsburg s.s.
270 - 305	Gray to light gray lime
305 - 320	Black sandy and shaly lime
320 - 345	Gray to shaly looking lime
345 - 355	Chocolate colored shale
355 - 395	Black sandy shale
395 - 450	Shale - some gray and dark colored lime - Base of Golconda
450 - 470	Gray sand - shale seams
470 - 525	Hard white sand
525 - 595	Shelly gray sand
595 - 642	White sand. Few Zn shs. Base of Bethel 642

642 - 660	Gray and brown lime
660 - 695	Gray lime - selvage
695 - 720	Gray and dark colored lime
720 - 735	Rosiclare sand - lime inclusions
735 - 740	do do - oily
740 - 745	do do
745 - 755	Light gray lime
755 - 765	Gray lime, trace of selvage
765 - 770	Gray lime. Con. calcite
770 - 790	Gray lime
790 - 800	Brown lime
800 - 815	White lime. Few Zn shs.

C O P Y

OZARK-MAHONING COMPANY

Hill-Ledford Tract
Hole No. 49-M
Elevation: 427.2
1755' N. 120' W. of SW Cor. of
SE¼ of NW¼ of Sec. 24, Twp. 11 S,
R 9 E, Hardin County, Illinois
or
300' W. 13' N. of 46-M

Started: 10-6-53
Completed: 11-6-53

Water: 85 - 90 ft.
No lower water noticeable
Stands 81 ft.

Drilled by: B. W. Bales
Examined by: A. G. Johnson
Casing: 36' - 6¼"

0 - 25	Soil, clay and boulders
25 - 65	Shale and selvage - lime streaks
65 - 110	Dark colored shaly lime. Base of Menard 110 ft.
110 - 165	Sandy shale - shaly sand
165 - 180	Vienna lime - light gray and shaly
180 - 185	Dark colored shaly lime
185 - 250	Gray sand - shale streaks
250 - 255	Dark colored sandy shale O some lime. Base Tar Springs 255'
255 - 300	White and light gray lime
300 - 325	Shaly lime - shale seams. Base of Glenn Dean - 325 ft.
325 - 355	Sandy shale - shaly sand
355 - 380	Gray sand - shaly at base. Hardinsburg base @ 380 ft.
380 - 400	Gray to light gray lime
400 - 420	Gray lime, con. selvage
420 - 450	Gray lime - shale and selvage
450 - 460	Chocolate colored shale
460 - 555	Gray and dark colored lime - shale and selvage. Base of Goldonda 555'
555 - 595	Gray sand - shale seams
595 - 640	White sand. Hard and tight

640 - 655	Shelly gray sand
655 - 747	White sand. Base of Bethel 547 ft.
747 - 770	Gray lime
770 - 790	Gray lime - selvage
790 - 815	Dark colored shaly lime
815 - 825	Lighter colored lime
825 - 848	Rosiclare sand
828 - 865	Light gray lime
865 - 900	Gray lime
900 - 915	Brown lime
915 - 923	White lime

C O P Y

OZARK-MAHONING COMPANY

Hill-Ledford Tract
Drill Hole: 50-M
Elevation: 398.0
Location: 1708' north and 910' east of the S.W.Corner of N.W. ¼ of Sec. 24, Twp. 11 S., Range 9E., Hardin County, Illinois or 12 ft. south and 300 ft. west of 49-M.

Started 11-6-53
Finished 12-5-53

Water: 37 ft. Fair
Stands at 21 ft.
No lower water apparent

Drilled by: B. W. Bales
Examined by: E. A. Brecke
Casing: 32 ft.

0 - 30	Surface
30 - 60	Gray shale, streak brown lime
60 - 80	Black shale, few lime s streaks
80 - 115	Gray shale sand streaks
115 - 135	Gray shale, sandy
135 - 165	Gray sand
165 - 180	Gray sand, shale streaks
180 - 205	White sand
205 - 220	Gray shale, sandy
220 - 280	Light gray crinoidal lime, Glenn Dean
280 - 290	Gray shale sandy
290 - 350	Gray sand, shaly streaks. Hardinsburg
350 - 385	Gray and brown lime, shale streaks
385 - 415	Gray shale, lime streaks
415 - 435	Gray and maroon shale
435 - 505	Gray calcareous shale
505 - 520	Gray shale sandy
520 - 625	White sand
625 - 685	Gray shelly sand
685 - 700	White sand
700 - 710	Gray sand, few shaly partings

710 - 715	Gray sand, and gray lime. Base of Bethel 712
715 - 730	Brown Lime
730 - 735	Brown lime, little green shale
735 - 770	Shale and selvage, con. brown lime
770 - 785	Dark brown shaly lime
785 - 790	Lower O'Hara lime
790 - 815	Rosiclare sand, con. brown lime
815 - 845	Light gray oolitic lime
845 - 870	Light brown lime
870 - 880	Dark brown lime
880 - 885	Dark brown lime, con. Sub Rosiclare sand
885 - 890	Some green shale, little light gray lime
890 - 895	Light gray oolitic lime

C O P Y

OZARK-MAHONING COMPANY

Hill-Ledford Tract
Drill Hole 51
Elevation: 387
Location: 1707' north and 611' east of the SW corner of NW¼ of Sec. 24, T 11 S, R 9 E, Hardin County, Illinois or 299' west of 50-M
Drilled by: Moreland and Hohler
Examined by: E. A. Brecke
Casing: 24'

Started: 11-5-53
Finished: 12-9-53

Water: 40-45 Fair
Stands @ 25'

Crevice 790 - 793
No lower water apparent

0 - 20	Surface
20 - 30	Dark brown lime, shaly and oxidized
30 - 55	" " " "
55 - 95	Dark gray shale, sand streaks
95 - 140	Gray shale, lime streaks
140 - 205	Gray sand, shale streaks
205 - 210	Gray shale, lime streaks
210 - 260	Gray orinoidal lime - Glenn Dean
260 - 300	Gray sand
300 - 340	Gray shaly sand
340 - 370	Gray and brown lime, shale streaks
370 - 390	Gray calcareous shale
390 - 410	Gray lime, shaly
410 - 415	Gray and maroon shale
415 - 505	Gray calcareous shale
505 - 520	Gray shale, sandy
520 - 635	White sand
635 - 670	Gray shelly sand
670 - 700	White sand
700 - 710	Gray lime. Base of Bethel 700

710 - 720	Brown lime
720 - 730	Brown lime little green selvage
730 - 760	Brown lime con. selvage
760 - 775	Brown lime
775 - 780	Lower O'Hara lime
780 - 800	Roseclare sand
800 - 830	Light gray oolitic lime
830 - 855	Light brown lime
855 - 870	Dark brown lime
870 - 875	Dark brown lime con. Sub-Rosiclare sand
875 - 880	Con. Sub-Rosiclare sand, little light gray lime
880 - 885	Light gray oolitic lime

C O P Y

OZARK-MAHONING COMPANY

Hill-Ledford Tract
Drill Hole No. 52-M
Elevation: 387.8
Location: 758' north and 345' east of S.W. corner of S.E. ¼ of N.W. of Sec. 24 or 57' south and 267' east of No. 48-M

Started 12-9-53
Finished 1-19-54
Water 35 - 40
Stands at 23 ft.
No lower water apparent.

Drilled by: Moreland and Hohler
Examined by: E. A. Brecke
Casing: 20 feet

0 - 18	Surface
18 - 45	Gray sandy shale
45 - 55	Gray shale
55 - 70	Gray and brown lime, shaly
70 - 95	Gray shale sandy
95 - 125	White sand
125 - 140	Gray sandy shale
140 - 185	Gray crinoidal lime
185 - 210	Brown lime shaly
210 - 220	Gray shaly sand
220 - 280	Gray sand, few shale partings, Hardinsburg
280 - 305	Gray and brown lime shale streaks
305 - 330	Gray shale, lime streaks
330 - 350	Gray lime, little maroon shale
350 - 375	Gray lime, shaly
375 - 425	Gray calcareous shale
425 - 440	Gray sandy shale
440 - 500	Cypress sand
500 - 530	Gray sand, little shale
530 - 600	Gray shelly sand
600 - 635	White sand
635 - 640	White sand, little gray lime. Base of Bethel 637.

640 - 665	Gray and brown lime
665 - 685	Gray lime, con. selvage
685 - 705	Brown lime
705 - 715	Lower O'Hara lime
715 - 739	Rosiclare sand
739 - 760	Light gray oolitic lime
760 - 780	Light browm lime
780 - 800	Dark brown lime
800 - 815	Light gray oolitic lime

C O P Y

OZARK-MAHONING COMPANY

Hill-Ledford Tract
Drill Hole: 53-M
Elevation: 419.5
Location: 779' north and 2006' east of the SW corner of NW¼ of Sec. 24 T 11 S R 9 E or 48' north and 333' east of No. 52-M
Drilled by: Moreland and Hohler
Examined by: E. A. Brecke
Casing: 32 feet

Started: 1-19-54
Finished: 3-10-54

Water:
80-85 Fairly strong
175-180 " "
380-385 " "
Stands @ 70'

0 - 30	Surface
30 - 55	Gray shale, sand streaks
55 - 90	Gray shale calcareous
90 - 100	Gray sand
100 - 135	Gray shale calcareous
135 - 150	Gray sand Tar Springs
150 - 180	Gray shale sand streaks
180 - 230	Light gray crinoidal lime Glenn Dean
230 - 250	Gray and brown lime, shaly
250 - 265	Gray shale sandy
265 - 295	Gray sand. Hardinsburg
295 - 305	Dary gray sand
305 - 370	Gray and brown lime, shale streaks
270 - 380	Gray shale
380 - 385	Gray and maroon shale
385 - 455	Gray calcareous shale
455 - 485	Shaly gray sand
285 - 515	Gray sand
515 - 580	White sand
580 - 645	Gray shelly sand
645 - 675	White sand

675 - 680	Gray shaly sand. Base of Bethel 680
680 - 700	Light gray lime
700 - 715	Brown lime, little green s elvage
715 - 725	Brown lime, con. selvage
725 - 750	Dark brown lime, little shale
750 - 760	Brown lime, sandy
760 - 782	Rosiclare sand
782 - 795	White colitic lime
795 - 820	Light brown oolitici lime
820 - 840	Dark brown lime
840 - 845	Dark brown lime, little oily white oolitic lime
845 - 850	Oily white oolitic lime

Atomic Energy Commission
AUG 2 - 1954

COPY

SUMMARY OF OZARK-MAHONING DRILL HOLE DATA

HILL-LEDFORD TRACT

Hole No.	Elev. Collar	Elev. Base of Bethel	Elev. Base of Rosiclare	Date Completed	Elevation of Mineralization
1-M	382.0	-219	-327	9-3-51	-333 to -343, 15.31 CaF_2, 1.82Zn
2-M	403.70	-202	-299	10-8-51	-296 to -306, 51.03 CaF_2, 0.20 Zn -326 to -356 Spar-Zn shines -356 to -376, 17.90 CaF_2, 6.35 Zn) 0.15 Pb)
3-M	400.0	-195	-290	11-3-51	-290 to -297.5, 45.67 CaF_2
4-M	399.8			12-17-51	Lost in Bethel sand formation at 570'
5-M	425.0	-182	-272	2-5-52	Cable Tools - Hole lost in ore at 720 ft. Completed with diamond drill equipment 8-12-52
5-M	(Diamond drill)				-272 to -280' 54.21 CaF_2 -325 to -334' 37.00 CaF_2, 13.20 Zn) 0.24 Pb)
6-M	420.3	-176	-284	3-14-52	-275 to -285', Spar shs. -330 to -347.5, 9.23 CaF_2, 11.00 Zn -347.5 to -365, 2.37 CaF_2, 4.35 Zn
7-M	416.4	-172	-274	4-26-52	-274 to -279, 50.81 CaF_2, 0.63 Zn, 0.17 Pb -279 to -289, No cuttings - openings
8-M	405.0	-202	-313	4-19-52	Blank
9-M	380.2	-250	-348	5-7-52	-345 to -352.5, 27.65 CaF_2 -352.5 to -410, Scattered spar-Zn shs. -410 to -420, 14.50 CaF_2, 1.60 Zn.
10-M	402.6	-200	-305	5-14-52	-297 to -304.5 18.60 CaF_2 -354.5 to -362 5.69 CaF_2, 0.97 Zn
11-M	412.1	-174	-274	5-29-52	Blank
12-M	380.7	-251	-354	6-9-52	-334 to -344, 45.92 CaF_2 -344 to -354 18.94 CaF_2 -354 to -374 11.90 CaF_2 -374 to -381.5, 38.06 CaF_2, 1.70 Zn -381.5 to -394, 19.30 CaF_2 -394 to -404 34.50 CaF_2, 0.70 Zn -404 to -434 11.10 CaF_2, 0.80 Zn -434 to -444 20.28 CaF_2, 1.59 Zn

12-M	(continued)				-444 to -459 21.05 CaF_2, 4.70 Zn -334 to -404 25.00 CaF_2, 0.28 Zn
13-M	400.0	-203	-306	6-7-52	Blank
14-M	397.2	-169	-275	6-26-52	-318 to -378 Scattered openings and crevices, V. F. cutgs. - strong water
15-M	407.1	-210	-312	7-2-52	-338 to -373, Dew spar & Zn shines.
16-M	381.0	-253	-346	7-3-52	-319 to -346.5, 40.90 CaF_2, 2.20 Zn -346.5 to -379, 16.80 CaF_2, 0.90 Zn -379 to -389, 41.85 CaF_2, 1.22 Zn -389 to -399, 25.30 CaF_2, 0.30 Zn -399 to -409, 33.80 CaF_2, 0.80 Zn -409 to 431.5, 21.50 CaF_2, 1.80 Zn -431.5 to -439, 22.46 CaF_2, 10.00 Zn -439 to -459, 30.00 CaF_2, 3.90 Zn -319 to -409, 29.80 CaF_2, 1.25 Zn
17-M	417.6	-167	-272	7-24-52	Blank
18-M	408.7	-200	-298	8-1-52	Blank
19-M	381.6	-256	-352?	7-26-52	-333 to -408, 50.50 CaF_2, 0.80 Zn -408 to -433 13.74 CaF_2, 2.96 Zn -433 to -438, 25.82 CaF_2, 3.91 Zn
20-M	416.4	-168	-269	8-19-52	-234 to -274, Spar and Zn shs. -334 to -344, Zn shines
21-M	381.0	-243	-347	8-16-52	-354 to -399, 30.80 CaF_2, 3.95 Zn
22-M	399.2	-167	-263	8-23-52	-263 to -271, 69.70 CaF_2 -271 to -321, Spar and Zn shines
23-M	380.3	-227	-323	9-9-52	Blank
24-M	398.5	-162	-261	9-18-52	-257 to -264.5, 43.13 CaF_2, 2.94 Zn -286 to -306, 11.23 CaF_2, 2.05 Zn 0.18 Pb
25-M	417.1	-191	-300	9-20-52	-293 to -303, 60.00 CaF_2, 0.32 Zn -303 to -333, 49.44 CaF_2
26-M	382.2	-251	-353	9-30-52	Blank
27-M	400.3	-148	-265	10-18-52	-252.5 to -265, 28.30 CaF_2 -265 to -292.5 18.90 CaF_2 -292.5 to -300, 51.90 CaF_2, 0.90 Zn -300 to 330, 14.00 CaF_2, 2.28 Zn

28-M	413.1	-189	-290	10-16-52	-289.5 to -302, 42.60 CaF_2 -302 to -307, 22.06 CaF_2 -307 to -362, Spar, Zn, Pb shines
29-M	383.9	-252	-353	10-22-52	Blank
30-M	412.3	-190	-298	11-8-52	-298 to -305, 25.50 CaF_2, 2.10 Zn 1.40 Pb Lost at 732 ft. Deepened to 778'. Diamond Drill cores - blank
31-M	401.9	-129	-228	11-12-52	-225.5 to -233, 35.90 CaF_2, -243 to -253, 20.35 CaF_2, 2.06 Zn, 1.90 Pb -278 to -298, 39.00 CaF_2, 5.60 Zn, 1.00 Pb -298 to -308, 11.10 CaF_2, 4.90 Zn, 0.75 Pb
32-M	381.3	-240	-351	11-13-52	-344 to -351.5, 16.15 CaF_2, 0.49 Zn, -384 to -396.5, 23.68 CaF_2, 2.75 Zn
33-M	378.3	-239	-338	12-8-52	-302 to -312, 31.42 CaF_2, 0.53 Zn -337 to 344.5, 9.70 CaF_2, 2.10 Zn -399.5 to -422, 17.80 CaF_2, 2.70 Zn V. F. Cutgs. from -399.5 to -427
34-M	423.1	-184	-283	12-10-52	-282 to -287, 31.10 CaF_2, 0.40 Zn
35-M	381.1	-246	-349	12-8-52	Blank
36-M	381.8	-230	-330	12-29-52	Blank
37-M	430.5	-161	-261	1-7-53	Blank
38-M	381.7	-303?	?	1-31-53	-158 to -293, 29.00 CaF_2 -313 to -343, 22.40 CaF_2, 2.17 Zn -398 to -413, 26.48 CaF_2 -413 to -428, 52.42 CaF_2

C O P Y

OZARK-MAHONING COMPANY

C. N. Hill Tract
Drill Hole No. 5 (Core)
Elevation: 425.0
Location: 723' north and 405' east of the SW Corner of NE-1/4 of SE-1/4 of Sec. 23 or 5' north and 60' west of Minerva No. 13

Started 7-11-52
Finished 8-12-52
Cable tool work completed 2-5-52

Drilled by: Baldwin
Examined by: E. A. Breck

672 - 675	Lower O'Hara lime
675 - 682	Rosiclare sand
682 - 683	Rosiclare sand, lime streaks
683 - 686	Rosiclare sand Dark
686 - 697	Dark brown Rosiclare sand, broken spar stringers
697 - 705	Good acid and replacement spar, little lime
705 - 712	Gray oolitic lime
712 - 733	Gray and brown lime
733 - 748	Brown lime, streaks of black shale, spar stringers at 733 and 736 feet. Scattered traces of spar, Pb and Zn
748 - 750	Green Sub-Rosiclare sand
750 - 755	Rich spar Zn and Pb ore - Brown silceous lime
755 - 759	Good Zn little spar some gray silcified lime
759 - 763	Leached gray oolitic lime scattered streaks of low grade spar Zn mineralization
763 - 776	Light brown oolitic lime

Ore face 697 - 705 averages 54.21% CaF_2
Ore face 750 - 759 averages 37.00 CaF_2
13.20 Zn
0.24 Pb

Assays	$CaCO_3$	CaF_2	Zn	Pb	SiO_2
697 - 705	9.63	54.21			26.06
750 - 755	3.61	47.12	13.28	.43	25.62
755 - 759	14.32	24.40	13.07		33.31

Remarks: This hole was deflected out of the cable tool hole to drill past a bit which was lost at 720 feet. The old hole was back filled to 667 feet with crushed lime and dement and a string of 2 inch pipe was set at this point. Deflection was accomplished by springing the bottom joint about 3/4 in. in ten feet. The cores from 672 - 675 indicate a deflection of about 1/4 inch per foot or a total of two feet per 100 feet.

The core recovery in the section from 697 to 705 was good and showed good replacement type of ore.

The core recovery from 750 to 755 was only 50%, however the section drilled firm without evidence of open ground. In all probability the lost core was spar Zn ore which would if recovered improve the assay.

The core recovery from 755 - 759 was 60% and a similiar conclusion to the section above it can be drawn, however the cores recovered showed considerable leached and silicified lime.

C O P Y

OZARK-MAHONING COMPANY

C. N. Hill Tract
Drill Hole No. 6
Elevation: 420.3
Location: 708' north and 311 east of the SW corner, NE 1/4 of SE 1/4 of Sec. 23 or 97' west of No. 5

Drilled by: Moreland and Hohler
Examined by: E. A. Brecke
Casing: 20 feet

Started 2-5-52
Finished 3-14-52

Water: 45' light
105 "
305 "
375 "
700 live strong
750-790 live and strong, very few cuttings stands 20'.

0 - 17	Surface
17 - 55	Shaly gray sand
55 - 65	Gray sand
65 - 85	Gray shaly sand
85 - 125	Brown lime shale streaks
125 - 195	Gray sand
195 - 225	Gray sandy shale
225 - 240	Gray lime
240 - 255	Gray lime - - Contract Idm E-255 started here
255 - 300	Gray shale, lime streaks
300 - 305	Maroon shale
305 - 380	Gray shale, lime streaks
380 - 405	" " sandy streaks
405 - 445	Gray sand
445 - 530	" " slightly shelly
530 - 580	White sand
580 - 595	Gray sand
595 - 597½	Gray sand, con. gray lime. Base of Bethel 596
597½ - 610	Gray lime
610 - 620	" " little green selvage
620 - 650	Brown lime, selvage streaks

650 - 665 Dark brown shaly lime

665 - 680 Lower O'Hara lime

680 - 695 Rosiclare sand

695 - 700 Rosiclare sand, spar shines

700 - 702½ Rosiclare sand, little calcite, spar shines

702½ - 705 " " " " " " , little white oolitic lime

705 - 715 White oolitic lime

715 - 745 Light brown lime

745 - 750 Dark brown lime, traces Zn and spar. Little brown silica

750 - 755 Brown lime, little shale, some Zn spar shines

755 - 760 Rich Zn, some chatty Zn on brown silica spar shines. Little black shale and green sand.

760 - 762½ Green sand, quartzitic, some Zn and black shale

762½ - 767½ Brown silica, some white gouge and black shale. Some Zn spar shines

767½ - 780 Brown silica, some green sand and white gouge, little free Zn

780 - 782½ Brown silica, little green sand, little oolitic lime, some free Zn

782½ - 785 Good Zn and brown silica, drilled soft 784 - 785

785 - 790 Some brown silica and gray lime, little free Zn

Ore face	750 - 767½	9.23% CaF_2 11.0 % Zn
Ore face	767½ - 785	2.37% CaF_2 4.35% Zn

Assay	$CaCO_3$	CaF_2	Zn
695 - 700	12.54	13.85	
700 - 702½	21.22	10.12	
702½ - 705	44.25	7.35	
750 - 755	35.04	12.47	7.36
755 - 757½	11.66	9.98	18.05
757½ - 760	7.05	9.43	19.17

Assay	$CaCO_3$	CaF_2	Zn
760 - 762½	7.05	10.39	15.67
762½ - 765	13.07	5.14	5.02
765 - 767½	11.66	4.73	4.31
767½ - 770	46.55	3.34	2.49
770 - 772½	49.03	2.79	3.00
772½ - 775	18.74	1.96	1.68
775 - 777½	24.06	2.24	1.38
777½ - 780	28.13	2.52	1.17
780 - 782½	49.74	1.55	.77
782½ - 785	12.72	1.20	20.04
785 - 790	52.13	4.66	4.12

C O P Y

OZARK-MAHONING COMPANY

C. N. Hill Tract
Drill Hole No. 7
Elevation: 416.4
Location: 711' north and 241' east of the S.W. corner of N.E. ¼ of S.E. ¼ of Sec. 23 or 3' north and 66' west of No. 6

Started 3-14-52
Finished 4-26-52

Water: 30 Light
60 "
290 "
335 Strong
697 "

Drilled by: Moreland and Hohler
Examined by: N. A. Brecke
Casing: 20 feet

0 - 20 Surface

20 - 60 Gray sand

60 - 80 Gray sand shaly

80 - 125 Brown lime, shaly G.D.

125 - 190 Gray sand

190 - 225 Black shale sandy

225 - 260 Gray and brown lime, shale streaks Golconda

260 - 290 Black shale lime streaks

290 - 295 Gray shale

295 - 300 Gray and Maroon shale

300 - 380 Black shale, lime streaks

380 - 400 " " sandy

400 - 430 Gray sand

430 - 490 White sand

490 - 545 Gray sand, shelly

545 - 585 White sand

585 - 590 " " , some gray lime, Base of Bethel 588

590 - 605 Gray and brown lime

605 - 635 Brown lime, some shale and selvage

635 - 655 Dark brown shaly lime

655 - 665 Lower O'Hara lime

665 - 687½	Rosiclare sand	
687½ - 690	Rosiclare sand, spar shines; cutting very fine	
690 - 692½	" " , some spar; cutting very fine	
692½ - 695	" " , some gray lime and spar; traces Zn and Pb.	B.P. 694
695 - 697	Drilled firm, cuttings lost	
697 - 699	Lost cuttings in cavity	
699 - 705	Lost cuttings, strong water	
705 - 715	Gray lime	
715 - 740	Light brown lime	
740 - 760	Dark brown lime	
760 - 780	Light buff lime	

Ore face 690 - 695 averages 50.81% CaF_2
.63% Zn
.17% Pb

Assays	CaO_3	CaF_2	Zn	Pb
687½ - 690	12.76	2.17		
690 - 692½	6.37	58.80		
692½ - 695	22.27	42.82	1.27	.34
705 - 710	81.88	4.59	.87	None

C O P Y

OZARK-MAHONING COMPANY

C. N. Hill Tract
Drill Hole No. 8
Elevation: 405.0
Location: 25' north and 170' west of the NE corner of the NE-¼ of SE-¼ Sec. 23 or 87' south and 160' west of No. 7 Minerva O. Co.
Drilled by: Moreland and Hohler
Examined by: E. A. Brecke
Casing: 20'

Started 3-20-52
Finished 4-19-52

Water	
35'	Light
95'	"
180'	"
240'	"
280'	Strong
340'	"
450'	"
510-560'	"
720'	"
755'	"

Stands @ 25'

0 - 20	Surface
20 - 35	Gray sand shale streaks oxidized
35 - 90	Gray sand shale
90 - 105	Black shale, some dense brown lime
105 - 150	Black shale, Brown lime streaks G.D.
150 - 205	Gray sand
205 - 240	Gray shale, sand streaks
240 - 275	Gray and browm lime shale streaks
275 - 315	Black shale, lime streaks
315 - 320	Gray fine grained sand
320 - 335	Black shale, some gray sand
335 - 390	Gray shale, scattered thin lime streaks
390 - 415	Gray shale sandy
415 - 460	Gray sand
460 - 505	White sand
505 - 570	Gray sand, shelly
570 - 600	White sand
600 - 605	Gray sand shaly
605 - 610	White sand, some gray lime Base of Bethel 607
610 - 630	Gray and browm lime, some calcite
630 - 655	Browm lime, con. selvage
655 - 675	Dark browm shaly lime
675 - 690	Lower O'Hara lime

690 - 718	Rosiclare sand
718 - 720	Gray oolitic lime
720 - 722½	Light gray oolitic lime, leached,trace spar
722½ - 725	Light gray oolitic lime, leached
725 - 740	Brown lime
740 - 760	Dark brown lime
760 - 765	Dark brown lime, little oily white oolitic lime
765 - 775	Light buff oolitic lime
775 - 815	Light brown oolitic lime

C O P Y

OZARK-MAHONING COMPANY

C. N. Hill Tract
Drill Hole No. 9
Elevation: 380.2
Location: 495' north and 415' east of the SW Corner of NW¼ of Sec. 24 or 93' north and 160' east of No. 8 Minerva
Drilled by: B. W. Bales
Examined by: E. A. Brecke
Casing: 30' of 6-5/8"

Started: 4-7-52
Finished: 5-7-52

Water: Hole Full @ 30'
470-490 Strong
724-726 Live Water
790-800 Live Sulfur Water

Note: Minerva Redda
Pump lowered water 45'

0 - 30	Surface
30 - 55	Gray shaly lime
55 - 95	Gray sand, shaly partings
95 - 105	Gray sandy shale
105 - 140	Gray lime, little shale
140 - 170	Brown lime shale streaks
170 - 210	Gray sand, shaly partings
210 - 230	Gray shaly lime
230 - 245	White sand, shale streaks
245 - 285	Shaly gray lime
285 - 320	Gray shale, lime streaks
320 - 325	Gray shale
325 - 330	Gray and maroon shale
330 - 405	Gray shale, few lime streaks
405 - 420	Sandy gray shale
420 - 460	Brown sand
460 - 490	Shelly gray sand
490 - 510	White sand
510 - 580	Shelly white sand
580 - 625	White sand

625 - 630	White sand, little lime trace spar. Base of Bethel 630
630 - 650	Gray lime, con. caved sand, traces spar and calcite
650 - 665	" " some salvage
665 - 685	Brown lime, con. salvage, little calcite
685 - 695	Lower O'Hara lime
695 - 725	Rosiclare sand
725 - 727½	" " , fair spar trace Zn. B. R. 728
727½ - 730	" " , some buff leached lime some spar
730 - 740	Buff leached lime some salvage, little spar, Zn shines
740 - 750	Brown lime, traces spar and Zn probably caved
750 - 775	Brown lime slightly leached
775 - 780	" " , little buff lime, spar and Zn shines
780 - 790	Light buff lime, traces Zn and spar
790 - 800	Buff lime little spar and Zn very few cuttings. See assay
800 - 806	Buff lime, spar and Zn shines
806 - 850	Brown and buff lime

Ore face 725 - 732½ averages 27.65 CaF_2

Assays	$CaCO_3$	CaF_2	Zn
727 - 727½	20.99	31.84	
727½ - 730	25.74	28.13	
730 - 732½	28.12	22.99	
732½ - 735½	29.77	18.29	
735½ - 738	36.35	19.14	
775 - 780	70.91	9.87	1.78
790 - 792½	66.70	7.45	.97
792½ - 795	61.30	10.16	1.78
795 - 797½	39.82	24.42	2.09
797½ - 800	48.96	16.00	1.58
800 - 803	57.56	8.87	.67

C O P Y

OZARK-MAHONING COMPANY

C. N. Hill Tract
Drill Hole No. 10
Elevation: 402.6
Location: 85' north and 197' west of the N.E. Corner of the N.E. 1/4 of S.E. 1/4 of Sec. 23 or 60' north and 28' west of No. 8

Drilled by Moreland and Hohler.
Examined by: E. A. Brecke
Casing: 20 feet

Started 4-19-52
Finished 5-14-52

Water:
50' - 90' - 170'
Light
275' - 345 and 425
Medium
705' Light
762' "
Water does not seem to be strong in this hole.

0 - 25	Surface
25 - 50	Gray lime and
50 - 85	Gray sand, shale streaks
85 - 95	Gray shale, sandy
95 - 145	Gray lime, black shale
145 - 205	Gray sand, shaly partings
205 - 230	Gray shale, sandy
230 - 305	Gray and brown lime shale streaks Golconda
305 - 330	Gray sand, few shale streaks
330 - 390	Gray shale, few lime streaks
390 - 440	" " , sandy
440 - 460	Brown sand
460 - 490	White sand
490 - 560	Gray sand, shelly
560 - 595	White sand
595 - 602-1/2	Gray sand
602-1/2 - 605	" " and gray lime. Base of Bethel 603
605 - 625	Gray lime
625 - 635	" " and green selvage

635 - 655 Brown lime, con. selvage

655 - 675 Dark brown shaly lime

675 - 685 Lower O'Hara lime

685 - 700 Rosiclare sand

700 - 707-1/2 Rosiclare sand, some purple spar. Base of Rosiclare 708

707-1/2 - 710 Rosiclare sand shaly, con. gray oolitic lime, spar shines.

710 - 715 Light gray oolitic lime

715 - 757-1/2 Gray to light brown lime, traces calc. and spar shines, spar probably cored.

757-1/2 - 762-1/2 Gray and brown lime, some quartz and calcite, trace Zn and spar, cuttings fine, some additional water at 762 feet.

762-1/2 - 765 Light gray and some brown lime, some quartz and calcite - traces spar and Zn.

765 - 785 White oolitic lime.

785 - 790 Gray lime.

Assays	CaO_3	CaF_2	SiO_2	Zn
700 - 705	16.24	17.86		
705 - 707-1/2	22.82	20.28		
757-1/2 - 762-1/2	56.28	6.45	26.51	1.28
762-1/2 - 765	59.57	4.17	24.88	.36

C O P Y

OZARK-MAHONING COMPANY

C. N. Hill Tract
Drill Hole No. 11
Elevation: 412.1
Location: 702' north and 141' east of S.W. corner of N. E. ¼ of S. E. ¼ of Sec. 23 or 7' south and 100' west of No. 7

Started 4-26-52
Finished 5-29-52

Water: 40 strong
586 "
No lower water noticeable.

Drilled by: Moreland and Hohler.
Examined by: E. A. Brecke
Casing: 20 feet

0 - 15	Surface
15 - 25	Gray shale, sand streaks
25 - 30	Red clay
30 - 45	Gray sand, shaly partings
45 - 55	White sand
55 - 70	Gray sand shaly
70 - 120	Gray and brown lime, shale streaks
120 - 190	White sand
190 - 195	Gray shaly sand
195 - 260	Gray and brown lime, shaly streaks
260 - 300	Gray shale, lime streaks
300 - 305	Gray and maroon shale
305 - 370	Gray shale, few lime streaks
370 - 395	" " , sandy
395 - 430	Gray sand
430 - 465	White sand
465 - 470	" " , shaly partings
470 - 555	White sand slightly shelly
555 - 575	White sand
575 - 585	Gray sand
585 - 590	" " , con. gray lime. Base of Bethel 586
590 - 610	Gray lime

610 - 615	Gray lime, little green selvage
615 - 635	Brown lime, con. selvage
635 - 660	Dark brown shaly lime
660 - 670	Lower O'Hara lime
670 - 675	" " " , some Rosiclare sand
675 - 686	Roseclare sand
686 - 720	Light gray oolitic lime
720 - 745	Light brown lime
745 - 755	Dark brown lime
755 - 760	" " " , little light gray oolitic lime
760 - 768	Brown lime, some gray oolitic lime

C O P Y

OZARK-MAHONING COMPANY

C. N. Hill Tract
Drill Hole No. 12-M
Elevation: 380.7
Location: 494' north & 487' east of the S.W. Corner of N.W. ¼ Sec. 24 or 70 feet east of No. 9-M.

Started 5-7-52
Finished 6-9-52
Water: 35 light
240 strong
598 "
720 " Sulfur
764)
786) lost cuttings

Drilled by: B. W. Bales

Examined by: E. A. Brecke
Casing: 27 ft. of 8" casing

0 - 30	Surface
30 - 65	Dark brown lime, shale streaks.
65 - 70	Gray sand, shale streaks
70 - 100	Gray sand, shaly partings
100 - 110	Gray shale, lime streaks
110 - 120	Light gray lime, shale streaks
120 - 130	Light gray crinoidal lime
130 - 170	Gray and brown lime, shale streaks
170 - 195	Gray sand, shaly partings
195 - 210	Gray sand
210 - 235	Gray shaly sand
235 - 250	Gray sand
250 - 320	Gray and brown lime, shale streaks. Golconda.
320 - 325	Gray shale
325 - 330	" and maroon shale
330 - 410	Gray shale, few lime streaks
410 - 425	" " , sandy
425 - 455	Brown sand
455 - 500	White shally sand
500 - 525	White sand

525 - 590	White shaly sand
590 - 625	White sand
625 - 630	White sand, broken traces of spar
630 - 635	" " , some flint and lime, spar shines, Base of Bethel 632
635 - 650	Gray lime, spar shines
650 - 655	Gray lime
655 - 685	Shale and selvage, lime streaks
685 - 690	" " " " " , some leached buff, lime showing ZnS. See assay.
690 - 700	Brown shaly lime
700 - 710	Lower O'Hara lime. Little Zn 705 - 710.
710 - 715	Rosiclare sand
715 - 720	Rich acid spar and some Rosiclare sand
720 - 735	Very few cuttings, strong sulfur water. Con. caved sand & shale, little leached lime with spar shines & trace Zn.
735 - 750	Leached buff lime, con. caved shale, some spar, trace Zn
750 - 755	Buff leached lime
755 - 762-1/2	Buff leached lime, some brown siliceous material, some acid spar & some free and chatty Zn
762-1/2 - 770	Very few cuttings, con. caved shale, some buff lime, little spar, traces Zn
770 - 785	Buff lime. little spar, traces Zn, Con. caved material
785 - 790	Very few cuttings. Buff lime, spar and Zn shines. Con. caved black shale
790 - 800	Brown lime, con. caved green shale, spar and Zn shines
800 - 820	Very few cuttings, con. caved green shale, little buff lime, spar & Zn shines
820 - 845	Buff lime, spar shines, some red Zn, con. caved green & black shale
845 - 850	Brown and buff lime, little Zn, very fine. Con. green shale, drilled firm.
850 - 854	Dark brown lime, con. cabed green shale

Ore face from 715 - 725 ft. averages 45.92 CaF_2

" " " 725 - 750 ft. " 17.08 "

Ore face from 755 - 762½ ft. averages 38.06 CaF_2 and 1.70 Zn

" " " 762½ - 775 ft. " 19.30 "

" " " 775 - 785 Ft. " 34.50 " and 0.70 Zn

Hole No. 12 - ASSAYS

	CaCO3	CaF2	Zn
685 - 690	68.39	28.30	2.17
705 - 710	75.58	3.67	1.22
715 - 720	8.94	46.97	0.07
720 - 725	11.46	44.87	-
725 - 730	10.38	19.93	-
730 - 735	12.18	17.96	-
735 - 740	30.86	13.90	-
740 - 742½	20.98	18.10	-
742½ - 745	28.52	19.08	-
745 - 750	31.75	15.02	-
755 - 760	10.74	40.35	1.96
760 - 762½	15.59	33.49	1.22
762½ - 765	18.64	19.48	-
765 - 770	8.58	15.13	-
770 - 772½	12.72	22.98	-
772½ - 775	9.48	23.82	-
775 - 780	8.58	33.21	-
780 - 783	11.46	32.09	1.22
783 - 785	10.02	41.34	1.12
785 - 787½	9.84	18.50	0.70
800 - 805	22.59	7.71	0.38
805 - 810	16.85	7.99	0.49

HILL-LEIFORD TRACT
SUPPLEMENTAL SHEET - Hole No. 12-M

	$CaCO_3$	CaF_2	Zn
787½ - 790	14.51	16.70	1.48
790 - 795	21.16	11.24	1.01
795 - 800	20.26	10.96	1.01
810 - 815	11.10	11.10	0.91
815 - 820	17.74	20.63	1.43
820 - 825	17.03	19.93	1.75
825 - 830	10.56	21.61	4.49
830 - 835	19.56	18.94	4.91
835 - 840	17.56	22.59	4.81
840 - 845	17.92	10.40	1.75
845 - 850	24.93	11.24	2.59

Ore face from 825 - 840 ft. averages 21.07 CaF_2
4.70 Zn

C O P Y

OZARK-MAHONING COMPANY

C. N. Hill Tract
Drill Hole No. 13-M
Elevation: 440.0
Location: 142' north and 224' west of the NE Corner of the NE-1/4 of Sec. 23 or 55' north and 25' west of No. 10-M
Drilled by: Moreland and Hohler
Examined by: E. A. Brecke
Casing: 20 feet

Started 5-14-52
Finished 6-7-52

Water 45'	Light
90'	Light
165'	Light
310'	Fair
340'	Fair
375'	Fair
505'	Fair
545'	Fair
600'	Fair
645'	Fair
660'	Fair
780'	Fair

0 - 25	Surface
25 - 75	Gray shaly sand and shale streaks
75 - 90	White sand, shaly partings
90 - 145	Brown lime and black shale
145 - 160	Gray sand, shale streaks
160 - 200	Gray sand
200 - 225	Gray shale, sandy
225 - 305	Gray and brown lime, shale streaks
305 - 310	Gray silty shale
310 - 325	Gray sand
325 - 400	Gray shale, lime streaks
400 - 430	White sand
430 - 500	White sand
500 - 560	Shaly white sand
560 - 600	White sand
600 - 602-1/2	Black shaly sand. Base of Bethel 603
602-1/2 - 605	Black shaly sand, some gray lime
605 - 625	Gray lime
625 - 630	Gray lime and green selvage
630 - 650	Brown lime, con. selvage
650 - 675	Dark brown shaly lime

675	-	680	Lower O'Hara lime
680	-	706	Rosiclare sand
706	-	720	Light gray lime
720	-	735	Light brown lime
735	-	765	Brown lime. little green selvage
765	-	770	Brown lime, little gray oolitic lime
770	-	780	Light gray oolitic lime

C O P Y

OZARK-MAHONING COMPANY

Hill-Ledford Tract
Hole No. 14-M
Elev. 397.6
Location: 693' N. 43' E. of S.W. Cor. or N.E. 1/4 of S.E.$\frac{1}{4}$ of Sec. 23, Twp. 11 S., R. 9 E. or 100 ft. W. - 10 ft. S. of 11-M
Drilled by: Moreland & Hohler
Examined by: A. G. Johnson
Casing - 20 ft.

Started 5-29-52
Completed 6-26-52
Water: 40 ft.
55 ft.
295 ft.
650 ft.

0 - 15	Soil and clay
15 - 35	Gray & oxidized sand - some gravel
35 - 60	Gray sand - shale seams
60 - 100	Gray and dark colored lime
100 - 165	Gray sand
165 - 200	Gray shaly sand
200 - 265	Gray and dark colored lime, shale streaks
265 - 415	Gray sandy shale, few lime streaks
415 - 470	Gray sand - few shale seams
470 - 566	White sand. B. B. 566 ft.
566 - 585	Light gray to gray lime
585 - 615	Gray lime, selvage seams
615 - 640	Dark colored shaly lime
640 - 650	Light colored oolitic lime
650 - 672	Rosiclare sand - hard-cuttings very fine
672 - 710	Hard light gray lime - cuttings very fine
710 - 715	Gray lime - few spar shines. Softer ground
715 - 720	No cuttings - crevice at 716 ft. Ground drilled hard & firm. Black sulfur water at 716'
720 - 735	Gray lime, very few cuttings. Hole drilled hard and firm.

735 - 740 Gray lime, very few cuttings. Formation solid crevice at 739 ft. Few Zn shines.

740 - 750 No cuttings - ground drilled hard and firm

750 - 755 " " " " " " " , crevice at 751 ft.

755 - 765 No cuttings - ground drilled hard and firm, opening at 763 ft.

765 - 775 Very few cuttings - tight & hard formation. 15" opening @ 774 ft. Light gray oolitic lime.

775 - 777 Very few cuttings - Light gray lime.

C O P Y

OZARK-MAHONING COMPANY

Hill-Ledford Tract
Hole No. 15-M
Elevation: 407.1
Location: 35 ft. S. 142' W. of NE Corner of the NE 1/4 of SE 1/4 of Sec. 23, Twp. 11 S., Range 9 E or 60' S. - 27' E. of 8-M.

Started 6-7-52
Completed 7-2-52
Water: 70' light
175' light
200' medium
280' settled cutgs. to 475 ft.
760' Medium stands at 50 ft.

Drilled by: Moreland and Hohler
Examined by: A. G. Johnson
Casing - 20 ft.

0 - 27	Soil and clay
27 - 100	Gray sand - shale streaks
100 - 155	Light gray and dark colored shaly lime, shale streaks
155 - 215	Mostly gray sand
215 - 235	Shale, sand, some lime
235 - 240	Gray sand, someshale
240 - 280	Light gray fossiliferous lime - shale seams
280 - 300	Dark colored shaly lime - shale
300 - 320	Light gray and dark colored lime - shale seams
320 - 325	Chocolate colored shale
325 - 420	Mostly sandy shale
420 - 505	White and gray sand
505 - 520	Gray sand, shale streaks. Point Creek
520 - 545	Hard white sand
545 - 570	Shelly gray sand
570 - 617	Hard white sand. B.B. 617 ft.
617 - 640	Light gray lime
640 - 680	" " " selvage and shale
680 - 698	Lower O'Hara - light gray sandy lime
698 - 719	Rosiclare sand

719 - 740	Light gray to gray lime
740 - 745	Gray lime, selvage streaks
745 - 760	Gray lime - few Zn and spar shines
760 - 780	Dark colored lime, very few Zn. shs.
780 - 810	Gray lime

C O P Y

OZARK-MAHONING COMPANY

Hill Ledford Tract
Hole No. 16-M
Elevation: 381.00
Location: 492' E. of NE Corner of the NE¼ of SE ¼ of Sec. 23 Twp., 11 S., Range 9 E or 71' East of 12-M

Started 6-9-52
Completed 7-3-52
Water 30'
85'
230 - 235 ft.
634 ft.
717 ft.
730 ft. Black Sulfur

Drilled by: B. W. Bales
Examined by: A. G. Johnson
Casing: 27'-8" pipe

0 - 35	Soil, clay and boulders
35 - 50	Dark colored shaly lime
50 - 75	Shaly sand
75 - 105	Gray and white sand, shale seams
105 - 115	Sandy shale, some white sand
115 - 155	Gray and dark colored lime, shale streaks
155 - 170	Shale and selvage, some lime
170 - 215	Gray sand shale streaks
215 - 230	Mostly sandy shale
230 - 250	White and gray sand, shale streaks
250 - 320	Gray and dark colored lime shale seams
320 - 355	Mostly sandy shale
355 - 430	Shale, some sandy, lime streaks
430 - 465	Gray sand, some shale and mud. Trace pyrite
465 - 500	White and gray sand
500 - 540	White sand
540 - 570	Shelly gray sand
570 - 595	White and gray sand
595 - 600	Shelly white sand, trace of spar
600 - 634	White sand, tight. Base of Bethel 634'

634 - 645 Light gray sandy lime

645 - 665 Light gray to gray sandy lime, trace Zn., shs. of spar

665 - 680 Gray lime, some selvage, Zn. & Spar shs., few cut'gs

680 - 700 Shale selvage, gouge and gray lime, few spar and Zn. shs., few cut'gs.

700 - 705 Rosiclare sand, some black quartz, trace Zn. - Lt. spar

705-707½ Rosiclare sand, some black quartz, tr. Zn., Lt. spar. Very few cut'gs

707½ - 712½ Rosiclare sand, black quartz, good acid spar. Tr. Zn. Few cut'gs

712½ - 715 Same as above. Pb shs.

715 - 722½ Rosiclare sand, selvage & gouge. V.F. cut'gs. Good acid spar. Tr. Zn.

772½ - 725 Rosiclare sand, black quartz. R. chatty Zn., good spar, V.F. cut'gs

725 - 727½ Rosiclare sand, tr. ls., some gouge, V.F. cut'gs., Lt. spar and Zn. Probable Roscilare contact 727 ft.

727½ - 730 Light gr. ls., some quartzite and gouge. Tr. spar & Zn, few cut'gs

730 - 732½ Light gray sandy ls., brown quartzite, Lt. chatty Zn & Spar - gouge. V.F. cut'gs.

732½ - 735 Light gray sandy lime, Con. caved surface sand. Tr. Zn and spar. V.F. cut'gs.

735 - 760 Mostly caved sand lt. ls. Trace Zn & spar. Few cut'gs.

760 - 765 Light gray sandy ls., some caved material. Good purple acid spar. Tr. Zn. Few cut'gs.

765 - 767½ Light gray sandy lime. Tr. spar and Zn. Few cut'gs.

767½ - 770 Light gray sandy ls. Con. purple acid spar. Tr. Zn. Few cut'gs.

770 - 780 Light gray sandy ls. Con. caved material, some gouge. Tr. spar & Zn Few Pb shs. Few cut'gs.

780 - 790 Light gr. sandy ls., some caved material, gouge, few cut'gs. Lt. spar. Tr. Zn.

790 - 800 Light gray sandy ls., gouge, caved material. Lt. spar & Zn. Few cut'gs.

800 - 812½ Gray sandy ls., selvage and gouge. Some caved material. Few cut'gs.

812½ - 820 Gray siliceous ls., some gouge. Few cut'gs., R. Zn. Lt. spar.

820 - 840 Gray lime, some gouge and selvage, caved material. Con. Zn. Lt. spar. Few cut'gs.

840 - 855 Gray ls., some caved material. Lt. Zn. and spar - More cut'gs.

Note:

From a depth of 700 feet on down to the bottom of hole, the recovery of cuttings per screw was anything from a small handful up to a quart. The ground drilled fairly firm but appeared to be full of small vugs. The water from 700' on down was strong and clear with black sulfur water at 730 ft.; consequently, most of the cuttings were washed away. In addition, there was a good deal of caved material in the ore cuttings which came from formations overlying the Rosiclare on to the surface.

Ore face from:	700 - 727½ ft.	averaged	40.90 CaF_2	
			2.20 Zn	
	727½ - 760 ft.	"	16.80 CaF_2	
			0.90 Zn	
	760 - 770 ft.	"	41.85 CaF_2	
			1.22 Zn	
	770 - 780 ft.	"	25.30 CaF_2	
			0.30 Zn	
	780 - 790 ft.	"	33.80 CaF_2	
			0.80 Zn	
	790 -- 812½ ft.	"	21.50 CaF_2	
			1.70 Zn	
	812½ - 820 ft.	"	22.46 CaF_2	
			10.00 Zn	
	820 - 840 ft.	"	28.00 CaF_2	
			5.40 Zn	

Assays - 16-M
Hill Ledford

	$CaCO_3$	CaF_2	SiO_2	Zn
700 - 705	14.69	32.40	44.18	1.33
705 - 707½	12.36	34.08	44.57	0.28
707½ - 710	4.99	74.29	19.04	1.01
710 - 712½	8.05	54.81	29.72	2.80
712½ - 715	5.53	48.37	39.86	1.86
715 - 717½	8.05	47.95	32.17	1.96
717½ - 720	9.84	59.02	23.25	2.70
720 - 722½	8.94	15.02	57.07	1.12
722½ - 725	6.61	24.27	54.72	7.20
725 - 727½	19.54	27.35	43.92	2.80
727½ - 730	31.57	9.98	40.68	1.12
730 - 732½	5.89	24.55	59.71	2.80

	$CaCO_3$	CaF_2	SiO_2	Zn
732½ - 735	3.25	12.69	62.73	1.01
735 - 737½	3.61	22.65	62.06	1.01
737½ - 740	3.98	22.51	63.34	0.80
740 - 742½	4.34	7.57	70.71	0.38
742½ - 745	3.61	7.28	75.23	0.49
745 - 750	3.43	19.24	65.14	0.49
750 - 752½	5.62	19.52	68.89	0.38
752½ - 755	8.72	13.69	64.04	0.70
755 - 760	3.25	19.81	69.62	0.91
760 - 765	4.16	48.97	46.39	1.23
765 - 767½	14.55	15.96	60.54	1.01
767½ - 770	5.43	53.53	41.10	1.43
770 - 772½	23.85	18.67	41.91	0.49
772½ - 775	6.53	37.87	48.59	0.28
775 - 777½	3.79	23.79	61.60	0.28
777½ - 780	4.16	20.80	59.39	0.17
780 - 782½	4.16	41.15	47.38	0.49
782½ - 785	5.98	36.88	48.13	0.07
785 - 787½	18.58	16.68	45.11	0.38
787½ - 790	10.54	40.58	36.70	2.28
790 - 795	11.63	19.52	55.78	1.43
795 - 797½	10.36	22.65	56.72	1.22
797½ - 800	13.64	27.35	45.17	2.38
800 - 802½	14.37	25.50	45.01	3.54
802½ - 805	28.05	22.79	31.89	1.75
805 - 807½	41.54	21.80	28.52	1.96
807½ - 810	42.45	15.39	25.73	1.12

	$CaCo_3$	CaF_2	SiO_2	Zn
810 - 812½	34.61	19.38	26.02	0.80
812½ - 815	23.31	27.35	22.52	12.81
815 - 817½	28.23	20.37	24.89	9.86
817½ - 820	25.68	19.66	35.54	7.23
820 - 825	26.41	23.22	26.67	3.86
825 - 830	20.75	26.21	27.56	2.70
830 - 835	13.28	39.16	33.33	4.17
835 - 840	12.91	31.76	33.76	3.96

C O P Y

OZARK-MAHONING COMPANY

C. N. Hill Tract
Drill Hole No. 17-M
Elevation: 417.6
Location: 624' north and 186' east of the S.W. Corner of N.E. 1/4 of S.E. 1/4 of Sec. 23 or 87' south and 55' west of 7-M
Drilled by: Moreland and Hohler
Examined by: E. A. Brecke
Casing: 20 feet

Started 6-26-52
Finished 7-24-52

Water: 75' Light
375' Fair
585' "
Stands 67'

0	-	20	Surface
20	-	35	Oxidized sand and shale
35	-	45	Black shale
45	-	60	Gray sand shaly partings
60	-	75	Dark gray sandy shale
75	-	125	Dark brown lime, shaly
125	-	185	Gray sand
185	-	225	Gray shaly sand
225	-	290	Gray and brown lime, shaly streaks
290	-	295	Gray calcareous shale
295	-	300	Gray and maroon shale
300	-	360	Gray shale, lime streaks
360	-	410	Gray shale sand streaks
410	-	430	Brown sand
430	-	495	White sand
495	-	560	Gray sand, slightly shaly
560	-	585	White sand
585	-	590	Gray and brown lime, little sand. Base of Bethel 585
590	-	605	Gray and brown lime
605	-	610	Gray lime, little green selvage

610 - 635	Brown lime, son. selvage	
635 - 655	Dark brown shaly lime	
655 - 670	Lower O'Hara lime	
670 - 690	Rosiclare sand	
690 - 720	Light gray oolitic lime	
720 - 740	Brown lime	
740 - 750	Dark brown lime	
750 - 755	" " "	, trace zinc
755 - 760	" " "	, little Sub Rosiclare sand
760 - 780	Gray oolitic lime	

Assay	$CaCO_3$	CaF_2
685 - 690	12.55	2.85

C O P Y

OZARK-MAHONING COMPANY

C. N. Hill Tract
Drill Hole No. 18-M
Elevation: 408.7
Location: 108' south and 137' west of the N.E. Corner NE$\frac{1}{4}$ of SE$\frac{1}{4}$ of Sec. 23 or 73' south and 15' east of 15-M
Drilled by: Moreland and Hohler
Examined by: E. A. Brecke
Casing: 20 feet

Started 7-2-52
Finished 8-1-52

Water		
	100'	Light
	180'	Fair
	385'	"
	555'	"
	660'	"
	780'	"

0	-	28	Surface
28	-	45	Gray calcareous shale
45	-	75	Gray sand, shaly partings
75	-	95	Gray sandy shale
95	-	140	Gray and brown lime, shaly streaks
140	-	200	Gray sand
200	-	220	Gray sandy shale
220	-	225	Gray sand, shaly partings
225	-	310	Gray and brown lime, shale streaks
310	-	315	Gray and maroon shale
315	-	380	Gray shale, lime streaks
380	-	415	" " , sandy
415	-	495	White sand
495	-	565	Gray slightly shelly sand
565	-	600	White sand
600	-	607$\frac{1}{2}$	Gray shaly sand. Base of Bethel 609
607$\frac{1}{2}$	-	610	" " " , some gray lime
610	-	635	Gray lime
635	-	645	Brown lime, little green selvage
645	-	655	Brown lime, con. selvage

655 - 675	Dark brown lime, slightly shaly
675 - 690	Lower O'Hara lime
690 - 707	Rosiclare sand
707 - 730	Light gray oolitic lime
730 - 750	Light brown lime
750 - 775	Dark brown lime
775 - 785	Light gray oolitic lime

C O P Y

OZARK-MAHONING COMPANY

C. N. Hill Tract
Drill Hole No. 19-M
Elevation: 381.6
Location: 491 ft. north and 628 ft. east of the S.E. corner of N.W. 1/4 of Sec. 24 or 71 ft. east of 16-M
Drilled by: B. W. Bales
Examined by: E. A. Brecke
Casing: 27 ft. 8 in.

Started 7-3-52
Finished 7-26-52
Water - 40 - 45 Light
80 - 85 "
180 - 185 Strong
600 Sulfur
638 Strong
787 "

0	- 35	Surface
35	- 45	Brown lime and gray shale
45	- 55	Gray shale
55	- 75	Gray sandy shale
75	- 115	White sand, some gray shaly lime
115	- 120	Gray calcareous shale
120	- 170	Gray and brown lime, shale streaks
170	- 185	Gray sand, shaly partings
185	- 210	Gray sand
210	- 230	Gray sandy shale
230	- 245	Gray sand
245	- 325	Gray and brown lime, shale streaks
325	- 330	Gray shale, little maroon shale
330	- 405	Gray shale, lime streaks
405	- 430	Gray shale, sandy streaks
430	- 440	Gray sand
440	-	Gray sand, con. shale
460	- 510	White sand
510	- 595	Gray shelly sand
595	- 600	White sand, little spar and brown siliceous material, tract Zn

600 - 625 White sand.

625 - 635 Gray sand.

635 - 640 Gray sand, some gray lime, spar shines. Base of Bethel 638

640 - 650 Gray and brown lime, traces spar, probably caved

650 - 675 Brown lime, some green shale

675 - 695 Dark brown shaly lime, little calcite

695 - 705 Broan dense lime

705 - 715 Lower O'Hara lime

715 - 732½ Very rich acid spar, some Rosiclare sand and little green shale

732½ - 737½ Rosiclare sand, some acid spar, little gray lime & green selvage

737½ - 742½ Good acid spar, some brown silicified lime. little green selvage

742½ - 745 Fair acid spar, some leached buff lime, trace Zn

745 - 752½ Buff leached lime, little green selvage, little spar, trace Zn

752½ - 757½ Good acid and low grade spar. Zn shines. Some buff leached lime and green selvage.

757½ - 760 Some acid spar and buff lime, con. caved gray and green shale, trace Zn

760 - 770 Buff lime, some acid and low grade spar. Zn shines, little shale

770 - 787½ Buff lime, some purple acid and low grade spar, little Zn.

787½ - 792½ Dark brown lime, little black shale, spar and Zn shines

792½ - 795 Good free and chatty brown Zn, some brown siliceous material and lime, little spar.

795 - 800 Light gray oolitic lime, little Zn, spar shines

800 - 815 Brown oolitic lime, little Zn, spar shines

815 - 820 Gray lime, some red Zn, little spar, drilled soft 816 - 819. Some caved spar.

820 - 835 Light brown lime.

Ore face 735 - 785 averages 52.77% CaF_2
0.72% Zn

Ore face 792½ - 797½ averages 30.23% CaF_2
4.75% Zn

Ore face 815 - 820 averages 25.82% CaF_2
3.91% Zn

or

Ore face 715 - 732½ averages 70.50 CaF_2

Ore face 737½ - 767½ averages 52.00 CaF_2
.71 Zn

Ore face 767½ - 785 averages 41.80 CaF_2
1.69 Zn

Ore face 792½ - 797½ averages 30.25 CaF_2
4.75 Zn

Ore face 815 - 820 averages 25.82 CaF_2
3.91 Zn

Assay	$CaCo_3$	CaF_2	Zn
635 - 640	23.85	17.64	
640 - 645	27.32	22.86	
645 - 650	42.09	27.89	
650 - 655	45.01	32.30	
715 - 720	10.36	63.60	
720 - 722½	10.36	45.96	
722½ - 725	6.89	78.96	
725 - 727½	2.33	93.34	
727½ - 730	2.70	71.57	
730 - 732½	2.70	83.23	
732½ - 735	6.71	36.42	
735 - 737½	11.45	24.47	
737½ - 740	5.98	67.87	
740 - 742½	6.16	60.04	
742½ - 745	5.43	52.07	.07
745 - 750	3.25	43.82	.70
750 - 752½	3.06	39.84	1.01

Assay	CaCO2	CaF2	Zn
752½ - 755	3.43	53.21	1.12
755 - 757½	4.89	51.65	1.22
757½ - 760	6.71	59.33	.28
760 - 762½	4.89	50.37	1.43
762½ - 765	5.07	60.47	1.01
765 - 767½	9.63	41.55	1.01
767½ - 770	21.66	31.87	.80
770 - 775	6.89	43.11	2.17
775 - 780	8.90	39.27	1.65
780 - 782½	5.62	49.51	1.22
782½ - 785	5.07	46.53	2.17
785 - 787½	46.83	21.63	1.12
787½ - 790	53.03	16.93	3.01
790 - 792½	13.28	16.79	2.07
792½ - 795	11.09	34.72	6.59
795 - 797½	16.56	25.75	2.91
797½ - 800	72.36	11.52	1.65
800 - 805	57.95	7.11	3.96
805 - 810	65.98	7.54	1.86
810 - 815	60.51	9.68	2.38
815 - 817½	24.76	25.18	4.71
817½ - 820	28.78	26.46	3.12

C O P Y

O. N. Hill Tract
Drill Hole No. 20-M
Elevation: 416.4
Location: 525' north and 183' east of the SW Corner of the NE-1/4 of the SE-1/4 of Sec. 23 or 99' south and 3' west of No.17-M
Drilled by: Moreland and Hohler
Examined by: A. G. Johnson
Casing: - 20 ft.

Started 7-24-52
Finished 8-19-52

Water 465 ft
500 - 505 ft

0 - 15	Surface
15 - 40	Gray shaly sand
40 - 50	Gray sand
50 - 65	Gray sandy shale
65 - 110	Gray and brown lime, shaly G. D.
110 - 175	Gray sand
175 - 195	Gray shale, sand streaks
195 - 210	Gray shale
210 - 280	Gray and brown lime, shale streaks
280 - 290	Gray and maroon shale
290 - 385	Gray shale, lime streaks
385 - 425	Gray shale, sandy
425 - 495	White sand
495 - 545	Gray shelly sand
545 - 580	White sand
580 - 585	Gray sand, little gray lime Base of Bethel 584
585 - 600	Gray and brown lime
600 - 620	Light gray lime, trace of selvage
620 - 650	Dark colored lime mud & selvage streaks
650 - 659	Lower O'Hara - Light gray oolitic lime Tr Zn & low grade spar
659 - 685	Rosiclare sand Spar shs. near base
685 - 690	Light gray oolitic lime Few spar & Zn shs
690 - 710	Gray lime
710 - 737	Gray to dark gray lime

737 - 741	Sub-Rosiclare sand
741 - 750	Light gray oolitic lime, con. calcite
750 - 760 -	Light gray oolitic lime, Zn shs.
760 - 775	Darker colored lime

There was no water of any kind in this hole to a depth of 465 ft. Stands at 375 ft. The hole was tight but drilled fairly soft.

C O P Y

O. N. Hill Tract

Drill Hole No. 21-M

Elevations: 381.0

Location: 478' north and 697' east of the S.W.Corner of N.W.$\frac{1}{4}$ of Sec. 24 or 13' south and 68' east of 19-M.

Drilled by: B. W. Bales

Examined by: A. G. Johnson

Casing - 30 ft. 8"

Started 7-26-52
Finished 8-16-52

Water: 50 - 55 ft.weak
180 - 185 ft. strong
470 - 475 ft.
580 - 585 ft.
680 - 690 ft.
767 - 770' - black sulphur

0 - 35	Surface
35 - 555	Gray calcareous shale
55 - 105	Gray sand, shale streaks
105 - 115	Gray shale sandy
115 - 175	Gray and brown lime, shaly
175 - 210	Gray sand, shaly partings
210 - 225	" " , shaly
225 - 245	Gray sand, shaly partings
245 - 325	Gray and brown lime, shaly
325 - 335	Gray shale, sand streaks
335 - 405	Gray shale, lime streaks
405 - 430	" " , sandy
430 - 470	Brown sand, con. shale
470 - 525	White sand, slightly shelly
525 - 555	" "
555 - 580	" " , slightly shelly
580 - 620	" "
620 - 625	" " , and gray lime. Base of Bethel 624
625 - 650	Gray and brown lime
650 - 660	Light gray lime, green selvage
660 - 695	Dark colored lime, shale and selvage.

695 - 708	Gray and tan colored lime. Lower O'Hara
708 - 728	Rosiclare sand. V.F. spar shines
728 - 735	Light gray oolitic lime. V.F. spar shs.
735 - 737-1/2	Light gray oolitic lime. Good acid spar
737-1/2 - 740	Light gray oolitic lime. Lt. spar
740 - 745	Light gray & silicified lime. G.Zn Pb shs.Lt.spar opening @ 744 ft. Few cutgs.
745 - 750	Light gray and silicified ls, some caved sand, G. Zn, Lt.spar, few Pb shs.
750 - 765	Light gray and sandy looking ls, some gouge. 6" opening @ 757 ft. G. Zn, Lt. spar
765 - 770	Mostly gray sandy ls. Tr. Zn & spar. Few ctgs.
770 - 775	Dull colored gray sandy ls. some brown and blacksiliceous material. Lt. Zn, Tr. spar
775 - 780	Brown & black quartzite, some lime, Sub-Rosiclare horizon. R - chatty Zn Lt. spar
780 - 800	Light gray oolitic lime. Tight ground, Spar & Zn shs.
800 - 830	Gray lime, Tight formation. Few Spar & Zn shs.
830 - 840	Brown lime
840 - 843	Gray lime

Ore ace from 737 - 780 ft. average 30.80 CaF_2 3.95 Zn

Hole No. 21-M	$CaCO_3$	CaF_2	SiO_2	Zn
737 - 737-1/2	22.07	59.27		None
737-1/2- 740	41.16	32.29		0.17
740 - 745	20.37	29.93		2.77
745 - 747-1/2	24.53	25.36		5.06
747½- 750	15.65	38.19		2.04
750 - 752-1/2	12.23	45.71	23.92	2.87
752-1/2 - 755	9.21	40.55	20.02	8.39
755 - 757-1/2	13.74	35.98	31.25	4.43

	$CaCO_3$	CaF_2	SiO_2	Zn
757-1/2 - 760	15.84	31.70	30.80	5.37
760 - 762-1/2	9.41	37.45	33.74	4.33
762-1/2 - 765	19.41	36.12	25.85	1.00
765 - 767-1/2	26.01	25.80	36.47	1.21
767-1/2 - 770	65.09	8.55	19.55	0.69
770 - 775	10.91	18.87	56.23	2.77
775 - 777-1/2	3.17	16.22	43.82	11.51
777-1/2 - 780	2.79	23.89	44.57	12.97

Ore face from 735 - 780 ft. averages 30.80 CaF_2

3.95 Zn

COPY

OZARK-MAHONING COMPANY

Hill Ledford Tract
Hole No. 22-M
Elev. 399.2
Loc. 420' N. 168' E. of SW Cor. of NE¼ of SE¼ of Sec. 23
or 102' S. 10' W. of 20-M
Drilled by: Moreland and Hohler
Examined by: A. G. Johnson
Casing: 10 ft.

Started: 8-1-52
Completed: 8-23-52

Water: 170' Trace
265' Light
365'
405-410
665 ft.
Stands 250 ft.

0 - 3 Soil & clay

33 - 20 Oxidized sand

20 - 40 Gray sand - shale streaks

40 - 85 Light gray & brown lime - shale seams. Glen Dean

85 - 155 White and gray sand

155 - 190 Gray shale - sand & lime streaks

190 - 225 Light gray shaly lime

225 - 260 Gray & brown lime - shale seams

260 - 265 Chocolate colored shale

265 - 355 Gray shale - lime streaks

355 - 410 Gray shale - sand streaks

419 - 470 White sand

470 - 530 Shelly white & gray sand

530 - 555 White sand

555 - 560 Shelly gray sand

560 - 566 White sand. B.B. 566 ft.

566 - 580 Gray lime

580 - 610 " " , selvage seams

610 - 625 Dark colored shaly lime

625 - 640 Light gray to gray oolitic limestone. Impregnated with tar.

640 - 662 Rosiclare sand

662 - 665 Good acid, some replacement spar . Zn shines. Trace of lime, some siliceous material.

665 - 667½ Acid, some replacement spar. Very light lime.

667½ - 670 Acid, some replacement spar. Con.lime

670 - 672½ Light gray oolitic ls. Lt. spar

672½ - 675 Light gray oolitic ls. Tr. spar

675 - 710 Gray lime, fairly soft & loose. Spar & zinc shs.

710 - 720 Light gray somewhat siliceous lime. Lt. Zn.

720 - 760 Light gray lime, scattered spar & Zn shs.

Ore face from 662-670 ft. averages 69.70 CaF_2

Assays	$CaCO_3$	CaF_2	SiO_2	Zn
662-665	3.74	61.34	28.80	0.58
665-667½	5.44	81.09	9.03	
667½-670	11.30	68.56	6.93	
670-672½	48.15	27.89	11.28	

C O P Y

OZARK-MAHONING COMPANY

Hill-Ledford Tract
Hole No. 23-M
Elevations: 380.3
Location: 434' N. 754' E. of S.W.Corner of N.W.$\frac{1}{4}$ of Sec.24
or 44' S. 58' E. of 21-M
Drilled by: B.W. Bales
Examined by: A. G. Johnson
Casing - none

Started 8-16-52
Completed 9-9-52

Water: 95 - 100 ft.
200 - 205 ft.
215 - 220 ft.
581 ft.
Stands 250 ft.

0 - 20 Soil, clay and gravel

20 - 29 Shale

29 - 47 Dark gray shaly lime

47 - 113 Gray sand - shale seams

113 - 167 White & gray lime - shale seams. Glen Dean

167 - 239 Gray sand - shale seams. Hardinsburg

239 - 410 Shale - lime and sand streaks. Golconda

410 - 445 Gray sand - shale

445 - 480 Gray sand

480 - 580 White and gray sand

580 - 585 No cuttings - crevice from 581-582$\frac{1}{2}$ ft. Difficult to drill through.

585 - 607 White sand. Few Zn shs.

607 - 615 Gray lime. Zn shs.

615 - 625 Gray lime.

625 - 660 Gray to dark gray lime - selvage

660 - 680 Shelly gray and dark colored lime

680 - 690 Rosiclare sand, lime streaks

690 - 700 Rosiclare sand

700 - 705 Light gray oily oolitic lime - some sand. Base of Rosiclare 703 ft.

705 - 720 Light gray oolitic lime

720 - 740 Gray lime

740 - 755 Gray to brown lime

755 - 765 Brown, slightly sandy ls. Sub Rosiclare

765 - 777 Light gray oily oolitic lime.

C O P Y

OZARK-MAHONING COMPANY

Hill-Ledford Tract
Hole No. 24-M
Elev. 398.5
Loc. 178' east, 328' north of SW Cor. of NE¼ of SE¼ of Sec.23
or 100' S - 10' E of 22-M

Started: 8-19-52
Completed: 9-18-52

Water: 60'
190'
655'
685'
Stands at 610 ft.

Drilled by Moreland and Hohler
Examined by: A. G. Johnson

0 - 4 Soil and clay

4 - 10 Oxidized sand

10 - 40 Sandy shale

40 - 85 Gray and dark colored shaly lime

85 - 150 Gray sand - shaly near base. Hardinsburg

150 - 185 Gray shale - lime and sand streaks

185 - 220 Light gray to gray lime - very few shale seams

220 - 255 Gray lime - shale streaks

255 - 270 Mostly chocolate colored shale

270 - 330 Shale - lime streaks

330 - 340 Gray lime - shale - Base of Golconda

340 - 365 Shale - sand streaks

365 - 400 Sand - shale streaks

400 - 460 Hard white sand

460 - 515 Shelly white and gray sand

515 - 555 White sand

555 - 560 Shelly gray sand. B. B. - 560 ft.

560 - 580 Gray lime

580 - 595 " " some selvage

595 - 620 Dark colored shaly lime, trace of selvage

620 - 638 Lower O'Hara - Light gray oolitic lime

638 - 650 Rosiclare sand

650 - 655 Rosiclare sand, spar shs.

655 - 657½ do Lt. spar

657½-660 Rosiclare sand, trace of lime

Few cutgs. Con. acid spar. Lt. Zn. Base of Rosiclare 659.5

660 - 662½ Purple acid and replacement spar, some light colored lime, trace of G. Zn. selvage

662½ - 665 Light gray oolitic lime. Tr. Zn and spar

665 - 670 do Spar & Zn shs.

670 - 685 Tan colored lime. Spar & Zn. shs.

685 - 705 Mostly brown quartz, some lime - spar - Zn - Pb shs.
Base of Sub-Rosiclare 705 ft.

705 - 730 Light gray oolitic lime. Few Pb & Zn shs.

Ore face from 655-662½ ft. averaged 43.13 CaF_2 - 2.94 Zn

Assays	$CaCO_3$	CaF_2	Zn	Pb
650 - 655	5.25	8.88		
655 - 657½	7.20	28.93		
657½- 660	10.17	37.92	3.52	
660 - 662½	10.73	62.54	5.30	
662½- 665	30.46	17.87	1.53	
685 - 705	34.55	11.23	2.05	0.18

C O P Y

OZARK - MAHONING COMPANY

Started 8-23-52
Completed 9-20-52

Hill Ledford Tract
Hole No. 25-M
Elevation: 417.1
Location: 950' N 670' E of SW Corner of NE$\frac{1}{4}$ of SE$\frac{1}{4}$, Sec.23

Drilled by: Moreland & Hohler
Examined by: A. G. Johnson
Casing: 20 ft.

Water: 50 ft.
170 ft.
295 ft.
500 ft.
560 ft.
712 ft.
Stands 650 ft.

0 - 20	Soil & clay
20 - 28	Weathered gray lime
28 - 60	Gray sand - shale seams
60 - 75	White sand
75 - 95	Gray sand - shale streaks
95 - 135	Light gray lime - shale seams
135 - 195	Gray sand
195 - 235	Shale - sand
235 - 305	Light & dark colored lime - shale seams
305 - 315	Chocolate colored shale
315 - 370	Shale - lime streaks
370 - 405	Dark colored shaly lime
405 - 420	Mostly shale
420 - 470	Sand - shale seams
470 - 495	White sand
495 - 580	Shelly white and gray sand
580 - 600	White sand
600 - 608	White sand - shale streaks B.B. 608'
608 - 630	Gray lime
620 - 695	Gray lime - green selvage - Lower O'Hara - Muddy
695 - 710	Rosiclare sand - spar shs.
710 - 712$\frac{1}{2}$	Rosiclare sand - trace lime. Con.acid spar
712$\frac{1}{2}$ - 715	Rosiclare sand - trace lime. G. spar - Pb & Zn shs.
715 - 717$\frac{1}{2}$	Rosiclare sand, tr. gray & black silicified lime. G.spar, Pb & Zn shs. Base of Rosiclare 717 ft.

717½ - 720 Light gray lime, some sand, Lt. spar

720 - 722½ Light gray lime, trace of shale and selvage
Light purple low grade spar, some acid

722½ - 735 Light gray oolitic lime, some purple low grade spar - Con. acid spar

735 - 737½ Gray sandy lime. Con. acid spar

737½ - 747½ Gray sandy ls., some calcite. G. spar, Pb shs. Trace of Barite

747½ - 750 Gray sandy lime, trace of selvage Con. spar

750 - 755 Gray sandy lime - Lt. spar. Few cuttings Base of Sub Rosiclare

755 - 765 Light gray oolitic lime

765 - 790 Gray lime

Ore face from 710 - 750 ft. averages 52.00 CaF_2

Hole No. 25-M
Hill Ledford

	$CaCO_3$	CaF_2	Zinc	$BaSO_4$
710 - 712½	9.22	55.17		
712½ - 715	7.71	78.62	0.69	
715 - 717½	9.22	68.29	0.59	
717½ - 720	19.62	38.07		
720 - 722½	34.55	41.61		
77½ - 725	43.05	37.63		
725 - 727½	23.40	54.29		
727½ - 730	25.10	52.22		
730 - 732½	19.62	56.06		
732½ - 735	23.58	49.13		
735 - 737½	19.05	47.65		
737½ - 740	19.81	42.34)		
740 - 742½	16.78	62.69)		
742½ - 745	17.16	65.05)		0.93
745 - 747½	25.47	43.03)		
747½ - 750	21.69	41.61		
750 - 755	34.73	33.35		

C O P Y

OZARK-MAHONING COMPANY

Hill-Ledford Tract
Hole No. 26-M
Elev. 383.2
Loc. 790' N 908' E of SW Corner of NW¼ of Sec. 24
or 312' N 213' E of 21-M

Drilled by: B. W. Bales
Examined by: A. G. Johnson
Casing: 29 ft.

Started 9-9-52
Completed 9-30-52

Water: 75-80 ft.
220-225 ft.
480-485 ft.
No lower water noticeable
Stands @ 220 ft.

0 - 14	Soil and clay
14 - 27	Creek gravel - water
27 - 57	Shale - sand streaks
57 - 75	Dark colored shaly lime - shale streaks
75 - 95	Sandy shale
95 - 145	Tar springs sand - shale seams
145 - 198	Glen Dean - Light gray and dark colored shaly lime
198 - 262	Hardinsburg sandstone, shale streaks
262 - 335	Light gray to dark gray shaly lime shale streaks
335 - 350	Chocolate colored shale
350 - 400	Mostly shale
400 - 440	Mostly dark colored shaly lime. Base of Golconda 440 ft.
440 - 480	Gray sand - shale seams
480 - 530	White sand. Dead oil 520-525'
530 - 605	Shelly white and gray sand
605 - 634	White sand. B. Bethel 634'
634 - 655	Gray lime
655 - 690	Dark colored shaly lime - some shale and selvage
690 - 710	Gray to light gray ls. Lower O'Hara
710 - 736	Rosiclare sand
736 - 755	Light gray to gray lime
755 - 775	Gray lime
775 - 790	Gray to brown lime, trace of selvage. Lt. sand near base. Base of Sub-Rosiclare 790'
790 - 808	Light gray oolitic lime

C O P Y

OZARK-MAHONING COMPANY

Hill-Ledford Tract
Hole No. 27-M
Elevation: 400.3
Location: 225' N. - 172' East of S.W.Corner of N.E.$\frac{1}{4}$ of S.E.$\frac{1}{4}$ of Sec. 23 or 100' South of 24-M
Drilled by: Moreland and Hohler
Examined by: A. G. Johnson
Casing - 20 ft.

Started 9-18-52

Completed 10-18-52
Water 50'
110'
330'
653'
Stands at 609'

0 - 4	Soil and clay
4 - 10	Creek gravel
10 - 25	Mud - oxidized sand
25 - 70	Gray lime - shale and mud seams
70 - 135	Gray sand
135 - 175	Gray sand - shale streaks
175 - 205	Gray and dark-colored shaly lime
205 - 240	Dark colored shaly lime - shale streaks
240 - 255	Chocolate colored shale
255 - 320	Shale - lime and sand streaks. Base of Golconda 320 ft.
320 - 360	Gray sand - shale streaks
360 - 547$\frac{1}{2}$	White and gray sand. B.B. 547.5
547$\frac{1}{2}$-550	Hard gray lime
550 - 560	Gray lime
560 - 575	Light gray lime
575 - 605	Dark colored lime - shale and selvage
605 - 615	Dark colored shaly lime
615 - 630	Light gray oolitic lime.
630 - 647$\frac{1}{2}$	Rosiclare sand

646½ - 650 Rosiclare sand, spar shs.

650 - 652½ " " Trace spar.

652½ - 655 V.F.cuttings, Rosiclare sand, Trace spar - Zn shs.Crevice @ 653 ft. Lost water. Stands at 6 09 ft.

655 - 660 V.F.cuttings, Rosiclare sand, trace spar and Zn.

660 - 665 Rosiclare sand, few cuttings, trace calcite. Lt. acid spar. B. R. 665 ft.

665 - 667½ Light gray sandy ls. - some sand.

667½ - 670 Light gray sandy lime, con.gouge. Lt. spar Zn shs.

670 - 672½ Light gray oolitic lime. Trace spar.

672½ - 675 " " " " , some calcite. Lt. purple spar.

675 - 677½ Gray lime. Tr. Zn - spar shs.

677½ - 680 Gray lime. Zn Shs.

680 - 690 Buff leached lime, little replacement spar.

590 - 692½ Leached brown lime, little acid spar, trace Zn.

692½ - 695 Some brown siliceous lime and black selvage, some purple acid spar.

695 - 697½ Good acid spar; some brown silica, Zn shines, chatty.

697½ - 700 Good spar, con. brown silica, Zn shines, little gray lime.

700 - 705 Gray and brown lime, little spar, Zn shines.

705 - 715 Con white calcite, little brown lime, little Zn, spar shines.

715 - 725 Brown lime, little white calcite, spar and Zn shines.

725 - 730 Brown lime, little calcite, fair Zn, spar shines, trace Pb.

730 - 740 Gray sandy lime, traces spar and Zn.

Ore face from	652½ - 665 ft.	averages	28.30 CaF_2	
	665 - 692½ ft.	"	18.90 CaF_2	
	692½ - 700 ft.	"	51.90 CaF_2	0.90 Zn
	700 ft.730 ft.	"	14.00 CaF_2	2.28 Zn

	$CaCO_3$	CaF_2	Zn
650 - 652½	9.82	27.02	
652½ - 655	9.50	32.86	
655 - 660	12.31	24.84	
660 - 662½	8.19	29.21	
662½ - 665	8.30	30.09	
665 - 667½	38.31	14.62	
667½ - 670	38.31	15.64	
670 - 672½	38.68	24.11	
672½ - 675	36.25	26.88	
675 - 677½	40.36	13.89	1.84
680 - 685	27.46	18.27	
685 - 690	10.25	27.35	
690 - 692½	11.18	28.78	
692½ - 695	5.95	47.89	
695 - 697½	2.02	67.74	0.80
697½- 700	13.43	40.16	1.95
700 - 702½	44.67	29.80	1.10
702½ - 705	39.05	15.79	0.48
705 - 710	65.80	10.68	2.89
710 - 715	72.53	9.81	2.05
715 - 720	65.99	13.75	2.58
720 - 725	43.54	10.54	0.80
725 - 730	46.54	16.23	4.57

C O P Y

OZARK -MAHONING COMPANY

Hill-Ledford Tract
Hole No. 28-M
Elev. 413.1
Loc: 945' W - 774' E of SW Cor.of NE¼ of SE¼ of Sec.23
or 104' E - 5' S of 25-M
Drilled by: Moreland & Hohler
Examined by: A. G. Johnson
Casing: 20 ft.

Started: 9-20-52
Completed: 10-16-52

Water: 26 ft.)
60 ft.)
160 ft.)
300 ft.)
420 ft.)
490 ft.)
665 ft.)
775 ft.)
Lost water @ 740'
Stands @ 700 ft.

0 - 18	Soil and clay
18 - 25	Shale - lime boulders
24 - 90	Gray sand - shale streaks
90 - 130	Gray and dark colored shaly lime. Glen Dean
130 - 190	Gray sand
190 - 220	Sandy shale
220 - 260	Light gray to dark gray shaly lime
260 - 300	Shale - lime & sand streaks
300 - 310	Chocolate colored shale
310 - 380	Shale - lime & sand streaks - Base of Golconda
380 - 410	Gray sand - shale streaks
410 - 540	Gray sand
510 - 595	White sand
595 - 602	Gray sand. B. B. 602 ft.
602 - 625	Gray lime
625 - 660	Dark colored shaly lime - shale & selvage
660 - 680	Light gray oolitic lime. Lower O'Hara
680 - 702½	Rosiclare sand
702½ - 705	Good acid spar - Rosiclare sand. Base of Rosiclare 703 ft.
705 - 707½	Light gr.ls. Lt. acid spar
707½ - 710	Gray lime - Spar and Zn shs.

710 - 715 Gray lime, calcite, some barite. Lt. spar, Zn shs.

715 - 720 Gray lime, conc. calcite, some barite, Lt.spar. Pb & Zn shs.

720 - 725 Dark gray lime, trace of cacite. Spar & Zn shs.

725 - 730 Dark gray lime

730 - 745 Gray to brown lime - spar - Zn - Pb shs.

745 - 750 Light gray oolitic lime. Zn shs.

750 - 775 do Spar - Zn - Pb shs.

775 - 788 Darker colored lime

Ore face from 702½ - 715 ft. averages 42.60 CaF_2

Assays	$CaCO_3$	CaF_2	SiO_2	$BaSO_4$
702½ - 705	7.82	67.88	20.76	
705 - 707½	36.62	46.11	13.35	
707½ - 710	60.75	24.11	9.95	
710 - 712½	42.98	35.93	14.57	3.61
712½ - 715	41.30	38.99	13.51	
715 - 717½	54.39	22.21	11.24	
717½ - 720	52.71	21.92	10.97	

C O P Y

OZARK-MAHONING COMPANY

Hill-Ledford Tract
Hole No. 29-M
Elev. 383.9
Loc: 1060' E. - 790' N of SW Cor. of NW¼ of Sec. 24
or 150' E. of 26-M
Drilled by: B. W. Bales
Examined by: A. G. Johnson
Casing: Pulled

Started: 9-30-52
Completed: 10-22-52

Water: 90'
125' strong
230' "
550' "
Stands 150 ft.

0 - 20	Soil and clay
20 - 40	Mud & gravel
40 - 55	Sandy shale
55 - 73	Gray and dark col. shaly lime
73 - 105	Sandy shale
105 - 138	Gray sand - shale streaks
138 - 197	Light gray to dark col. shaly lime. Glen Dean
197 - 261	Gray sand - shale seams. Hardinburg
261 - 290	Gray lime - shale seams
290 - 340	Dark colored shaly lime, many shale streaks
340 - 355	Chocolate colored shale
355 - 440	Shale - lime and sand streaks. Base of Golconda
440 - 465	Gray sand - shale streaks
465 - 540	White sand
540 - 600	Shelly wh. & gray sand
600 - 636	Hard white sand. B. B. 636'
636 - 655	Gray lime, trace of calcite
655 - 685	Gray lime, selvage seams
685 - 695	Dark colored shaly lime
695 - 710	Dark colored shaly lime, shale & mud slips
710 - 715	Gray lime
715 - 737	Rosiclare sand
737 - 775	Gray lime
775 - 800	Gr. to brown lime. Base Sub-Rosiclare 800 ft.
800-802½	Light gr. col. ls., trace calc. Contact @ 800' shaly. Few Zn shs.
802½ -805	Light gray oolitic lime

C O P Y

OZARK-MAHONING COMPANY

C. N. Hill Tract
Drill Hole No. 30-M
Elevation: 412.3
Location: 378' south and 534' West of the NE Cor. of NE$\frac{1}{4}$ of SE$\frac{1}{4}$ of Sec. 21 or 93' east of 28-M.
Drilled by: Moreland and Hohler
Examined by: E. A. Brooks
Casing: 20 feet.

Started 10-16-52
Finished 11-8-52

Water: 85 light
310 fair
600 light
700 fairly strong sulfur
717-720 Strong
Stands @ 670'

0 - 17	Surface
17 - 25	Sandy shale, little lime
25 - 50	Gray shaly sand
50 - 60	Gray sand
60 - 80	Gray shaly sand
80 - 110	Gray lime, shale streaks Glenn Dean
110 - 165	Gray shale, lime streaks
165 - 215	White sand
215 - 300	Gray and brown lime, shale streaks
300 - 305	Gray and maroon shale
305 - 375	Gray shale, lime streaks
375 - 405	Gray shale, sandy
405 - 465	White sand
465 - 485	" ", shaly partings
485 - 565	Gray shelly sand
565 - 590	White sand
590 - 600	Dark gray sandy shale
600 - 602$\frac{1}{2}$	" " " ", some gray lime, Base of Bethel 602.
602$\frac{1}{2}$ - 625	Gray and brown lime
625 - 655	Gray lime and green selvage
655 - 675	Brown shaly lime
675 - 680	Lower O'Hara

30-M

680 - 695 Rosiclare sand, some gray lime, trace calcite

695 - 710 " " " " " , broken and loose cased from 668-713

710 - 714 Rosiclare sand, some good acid spar, traces Pb and Zn

714 - 717 Rosiclare sand, some brown siliceous material, little spar, Pb and Zn.

717 - 725 Gray leached lime, little calcite, little brown siliceous material, some spar, Pb and Zn.

725 - 727½ Opening, few nuggets of spar and sand recovered.

727½ - 732 Brown siliceous material, spar, Pb and Zn shines.

Note: This hole was abandoned at 732 feet because of caving from the section from 725 - 727½. We were unable to drive the sleeve set from 668 to 713 to include the section from 725 - 727½.

Hole No. 30-M Hill-Ledford	$CaCO_3$	CaF_2	Zn	Pb
710 - 711	12.40	13.81	1.35	0.59
711 - 714	6.27	30.68	2.27	1.88
714 - 717	0.50	24.21	2.27	1.14
717 - 720	42.67	13.24	1.26	0.52
720 - 722½	41.23	14.96	1.36	0.14
722½ - 725	34.56	21.40	1.36	1.24
725 - 727½	No cuttings			
727½ - 730	14.74	8.04	2.37	0.07
730 - 732	10.78	14.23	3.38	0.31

Ore face from 710 - 717 ft. averages 25.50 CaF_2 2.10 Zn 1.40 Pb

C O P Y

OZARK-MAHONING COMPANY

Started 10-18-52
Finished 11-12-52

C. N. Hill Tract
Drill Hole No. 31
Elevation: 401.9
Location: 126' north and 177' east of the SW Cor. of NE¼ of SE¼ of Sec. 23 or 100' south and 6' west of No.27
Drilled by: Moreland and Hohler
Examined by: E. A.Brecke
Casing: 20 ft.

Water: 200 - 205
Lost @ 602½
Stood @ 580
612 strong stands @ 612

0 - 3	Surface
3 - 18	Oxidized sand and gravel
18 - 60	Gray and brown lime shale streaks
60 - 125	Gray sand, shaly partings
125 - 160	Gray shale, sandy
160 - 235	Gray and brown lime, shale streaks
235 - 240	Gray and maroon shale
240 - 310	Gray shale, calcareous
310 - 335	Black shale sandy streaks
335 - 385	White sand
385 - 495	Gray shelly sand, some hard streaks
495 - 520	White sand
520 - 530	Gray shaly sand
530 - 535	Gray lime, little shaly sand Base of Bethel 531
535 - 550	Gray and brown lime
550 - 560	Gray and brown lime, little green selvage
560 - 580	Brown lime and green selvage
580 - 600	Brown shaly lime
600 - 610	Lower O'Hara lime
610 - 627½	Rosiclare sand
627½ - 630	Rosiclare sand, Con. acid and replacement spar
630 - 635	Gray lime some spar
635 - 645	Gray lime spar shines

Hole 31

645 - 650	Gray lime, little spar, little Pb and Zn
650 - 655	Gray lime, some acid spar, little Pb and Zn
655 - 665	Gray lime, few cuttings traces spar Pb and Zn
665 - 670	Gray lime
670 - 680	Brown lime
680 - 685	Very rich acid spar, little Pb and Zn
685 - 690	Mostly brown quartz, good Zn, trace Pb little spar.
690 - 695	Light gray and brown quartz, trace Zn Pb and spar
695 - 700	Mostly light brown quartz, good chatty Zn, Pb shines, trace spar
700 - 705	Mostly light brown quartz, Con. Zn, spar and Pb shines
705 - 710	Light gray sandy lime, trace Zn, spar & Pb shines.
710 - 720	Light gray sandy lime, spar, Zn and Pb shines
	Base of Sub-Rosiclare Indef. 690 or 705 feet

Hill Ledford
Hole No. 31-M

	$CaCO_3$	CaF_2	Zn	Pb
627½ - 630	9.51	29.84		
630 - 635	17.26	38.97		
645 - 650	47.54	14.23	1.26	2.83
650 - 652½	39.07	24.63	2.77	0.77
652½ - 655	36.00	28.29	2.97	1.24
680 - 682½	16.72	70.05	3.17	0.80
682½ - 685	20.69	57.25	4.38	0.46
685 - 690	5.01	63.02	8.11	1.29
690 - 692½	38.35	14.51	2.32	0.34
692½ - 695	37.27	14.79	2.02	0.28
695 - 697½	23.21	20.98	7.40	1.81
697½ - 700	25.55	8.04	9.27	1.90
700 - 702½	18.52	15.92	5.04	0.73
702½ - 705	15.28	13.10	4.23	0.58
705 - 710	59.43	8.32	5.14½	0.88
Ore face from 627½-635' averages		35.90		
" " " 645-655 ft.avg.		20.35	2.06	1.90
" " " 680-700 ft. "		39.00	5.60	1.00
" " " 700-710 ft. "		11.10	4.90	0.75

COPY

OZARK-MAHONING COMPANY

C. N. Hill Tract
Hole No. 32-M
Elev. 381.3
Loc. 380' N 777' East of SW Cor.of NW¼ of Sec. 24 or
100' N.80' E. of 21-M
Drilled by: B. W. Bales
Examined by: A. G. Johnson & E. A.Brecke
Casing 31 ft. - 8"

St. 10-22-52
Comp.11-13-52

Water: 85-90 Light
205-210 Strong
Lost @ 731
Water stood at 160'
until opening at 731
was cut. Stands at 600'

0 - 19	Soil and clay
19 - 28	Mud and gravel
28 - 42	Shale
42 - 59	Gray shaly lime. Base of Vienna 59'
59 - 85	Gray and shaly sand
85 - 110	Gray sand
110 - 121	Shaly gray sand. B. of Tar Spgs. 121 ft.
121 - 150	Gray and dark colored shaly lime - shale streaks
150 - 178	Dark gray lime - few shale seams. B. of Glen Dean 178'
178 - 215	Gray sand
215 - 230	Shaly sand
230 - 253	Gray sand. B. of Hardinsburg 253 ft.
253 - 265	Gray and shaly looking lime
265 - 280	Gray lime - shale seams
280 - 290	Gray lime
290 - 315	Shale - lime streaks
315 - 325	Gray lime
325 - 330	Sandy shale
330 - 340	Chocolate colored shale
340 - 431	Shale - lime and sand streaks. B. of Golconda 431 ft.
431 - 575	White and gray sand
575 - 621	White sand, B.B. 621 ft.
621 - 640	Gray lime
640 - 680	do, selvage seams.

680 - 690 Dark colored shaly lime

690 - 703 Lighter colored lime. Lower O'Hara

703 - 725 Rosiclare sand - some lime, selvage and mud streaks

725 - 730 Few cutgs. Rosiclare sand, some green selvage. Some soft leached lime and brown secondary calcite. Lt. low grade purple and acid spar. Tr. Zn, Pb shs.

730 - 732½ V.F.cutgs. Mud pocket from 731-732 ft. Light gray sandy lime - spar - Cn-Pb shs. Lost water at 731 ft. Dropped from 160 ft. to 600 ft. Base of Rosiclare 732 ft.

732½ - 735 Light gray sandy lime - V.F.cutgs. Few spar shs.

735 - 737½ Light gray sandy lime. Few spar shs.

737½ - 755 Light gray sandy lime, Con. green selvage traces spar

755 - 760 Gray lime and green selvage

760 - 765 Dark brown lime

765 - 775 Brown lime, little brown silica, some spar and Zn

775 - 777½ Gray oolitic lime, some spar and Zn

777½ - 800 Light gray oolitic lime traces spar and Zn

Ore face from 765 - 777½ Averages 23.68 CaF_2 2.75 Zn

Assays	$CaCO_3$	CaF_2	Zn	Pb
725 - 730	27.17	20.42	0.56	0.15
730 - 732½	24.11	7.62	0.35	0.10
765 - 770	43.03	25.20	1.56	
770 - 772½	70.06	9.59	1.01	
772½ - 775	44.47	14.65	3.58	
775 - 777½	18.34	43.75	6.04	

COPY

OZARK-MAHONING COMPANY

C. N. Hill Tract
Drill Hole No. 33-M
Elevation: 378.3
Location: 340' north and 183' east of SW Corner of NW¼ of sec. 24 or 155' south and 233' west of 9-M
Drilled by: Moreland and Hohler
Examined by: E. A. Brecke
Casing: 31 ft.

Started: 11-8-52
Finished: 12-8-52
Water: 60 Light
200 "
315 "
360 "
560 "
685 Lowered water
715 Strong
777½ "
815 "
Stands @ 700

0 - 20	Surface
20 - 30	Oxidized calcareous shale
30-- 45	Black " "
45 - 50	Gray sand, shale streaks
50 - 55	Gray shale
55 - 100	Gray sand, shale streaks
100 - 110	Dark brown shaly lime
110 - 120	Light gray crinoidal lime
120- 160	Gray and brown lime, shale streaks
160 - 205	Gray sand
205 - 235	Dark gray shaly sand
235 - 320	Gray and brown lime, shale streaks
320 - 325	Gray and maroon shale
325 - 400	Gray shale, lime streaks
400 - 425	Gray shale
425 - 460	Gray sand, conc. shale
460 - 510	White sand
510 - 565	Gray shelly sand, slide @ 565'
565 - 610	White sand
610 - 615	Gray shaly sand
615 - 620-	Gray lime, some sand. Base of Bethel 617
620 - 630	Gray and brown lime
630 - 650	" " " ", little selvage
650 - 660	Shale and selvage, lime streaks

660 - 670	Dark brown shaly lime
670 - 675	" " " ", Zn shines, traces calcite and spar
675 - 680	" " " ", lit. Zn, spar shines
680 - 690	" " " ", Some spar, traces of Zn
690 - 692½	Lower O'Hara lime, little brown lime, spar shines, trace Zn
692½ - 695	" " " , some Rosiclare sand, traces spar and Zn
695 - 715	Rosiclare sand
715 - 717	" " " and gray lime spar shines
717 - 720	Gray oolitic lime, spar shines, fair Zn
720 - 722½	" " " " " , trace Zn
722½ - 750	Light brown lime
750 - 775	Dark brown lime
775 - 777½	Gray lime, little spar, trace Zn
777½ - 782½	Some acid spar and brown lime, Zn trace
782½ - 785	Con.shale, probably caved, some spar, some brown silica w.free & chatty/ Zn
785 - 790	Some spar & brown silica with chatty Zn.Some gray sandy oolite & con. gray shale
790 - 791½	Drilled firm
791½ - 795	Open
795 - 805	Chatty Zn on gray oolitic lime & brown silica. Little spar, some shale
805 - 807½	Brown silica on gray lime, spar and Zn shines
807½ - 820	Gray and brown lime
820 - 835	Brown lime

Note: Very few cuttings 777½ to 805.

Ore face 680 - 690 Averages 31.42 CaF_2 0.53 Zn

Ore face 777½ - 800 Averages 17.80 CaF_2 2.70 Zn

Assays	$CaCO_3$	CaF_2	Zn	Pb
675 - 677½	65.74	5.93	3.38	
677½ - 680	72.04	6.78	1.46	
680 - 682½	62.31	22.38)	1.36	
682½ - 685	60.87	23.38)	.76	
685 - 687½	36.90	51.35)		
687½ - 690	53.30	28.57)		
690½ - 692½	35.64	10.71		
715 - 717	50.96	9.45		
717 - 720	68.80	9.73	3.43	
720 - 722½	63.57	9.59	2.27	
775 - 777½	71.14	3.96	None	
777½ - 780	45.37	32.79)	.35	
780 - 782½	43.21	33.21)	.25	
782½ - 785	35.46	21.40)	1.81	
785 - 787½	39.61	8.32)	3.27	
787½ - 790	37.45	7.90)	1.46	
795 - 797½	42.67	13.81)	7.10	.14
797½ - 800	34.02	7.34)	4.68	
800 - 802½	30.07	5.79	3.83	
802½ - 805	61.77	5.51	1.66	
805 - 807½	58.17	4.81	.96	

C O P Y

OZARK-MAHONING COMPANY

C. N. Hill Tract
Drill Hole No. 34-M
Elevation: 423.1
Location: 952 ft. north and 580 ft. east of the S.W. Corner of the N.E. $\frac{1}{4}$ Sec. 23 or 3 ft. north and 90 ft. west of 25-M.

Started 11-12-52
Finished 12-10-52

Water 40 - 45 Light
Stands at 95 ft.
Bails to 200 feet, during shift.

Drilled by: Moreland and Hohler
Examined by E. A. Brecke
Casing: 20 feet

0	-	25	Surface
25	-	35	Gray calcareous shale
35	-	70	Gray sand, shaly partings
70	-	75	White sand
75	-	95	Gray sand shaly
95	-	105	Gray lime, shale streaks
105	-	140	Gray and brown lime, shale streaks
140	-	205	Gray sand, little shale
205	-	235	Gray shale sandy
235	-	310	Gray and brown lime, shale streaks
310	-	320	Gray and maroon shale
320	-	395	Gray shale, lime streaks
395	-	420	Gray shale, sandy streaks
420	-	475	Gray sand, con. caved shale
475	-	550	Gray sand, slightly shelly
550	-	595	White sand
595	-	605	Gray sand, shaly partings
605	-	610	Gray sand, some gray lime. Base of Bethel 607.
610	-	630	Gray lime
630	-	640	Gray lime and green selvage

630 - 640	Gray lime and green selvage	
640 - 655	Shale and selvage, lime streaks	
655 - 675	Dark brown shaly lime	
675 - 690	Lower O'Hara, sandy, barite, calcite and spar shines	
690 - 705	Rosiclare sand	
705 - 707½	Good acid and replacement spar, some Rosiclare sand, chatty Zn shines. B. R. 706	
707½ - 710	Gray lime and shale, little spar, Zn shines.	
710 - 730	Gray oolitic lime	
730 - 740	Brown lime	
740 - 745	" " , barite, spar and Zn shines	
745 - 750	Brown lime	
750 - 760	Dark brown lime	
760 - 765	" " " , little sub Rosiclare sand	
765 - 775	Gray oolitic lime	

Ore face 705 - 710 averages 31.10 CaF_2
.40 Zn

Assays	$CaCO_3$	CaF_2	Zn
705 - 707½	4.29	49.66	0.45
707½ - 710	38.17	12.54	0.35

C O P Y

OZARK-MAHONING COMPANY

C. N. Hill Tract
Drill Hole No. 35-M
Elevation: 381.1
Location: 662' north & 697' east of the SW Corner of NW¼ of Sec. 24 or 83' north & 59' west of 32-M
Drilled by: B. W. Bales
Examined by: E. A. Brecke
Casing: 21'-6" 8"

Started: 11-13-52
Finished: 12 -8-52

Water 60-65 Light
110-115 "
260-265 "
Stands 200

0	-	45	Surface
45	-	60	Gray & brown shaly lime
60	-	75	Shale lime streaks
75	-	85	" sandy streaks
85	-	120	Gray sand, shaly partings
120	-	125	Gray shale, sand streaks
125	-	135	Brown lime, shaly
135	-	150	Gray Crinoidal lime
150	-	205	Dark brown shaly lime
205	-	225	Gray sand, shaly partings
225	-	265	Gray sand, shale streaks
265	-	335	Gray and brown lime, shale streaks
335	-	340	Gray and maroon shale
340	-	420	Gray shale, lime streaks
420	-	440	" " , sandy
440	-	445	Black shale, some pyrite
445	-	475	Gray sand, shaly
475	-	595	Gray shelly sand
595	-	625	White sand
625	-	630	Gray lime, little sand. Base of Bethel 627

630 - 650	Gray lime
650 - 675	Gray lime, some green selvage
675 - 690	Brown lime, con. shale
690 - 705	Lower O'Hara lime
705 - 730	Rosiclare sand
730 - 740	Light gray lime
740 - 770	Brown lime
770 - 785	Dark brown lime
785 - 790	" " " , little gray sandy oolitie
790 - 795	Gray oily oolitic lime

C O P Y

OZARK-MAHONING COMPANY

C. N. Hill Tract
Drill Hole No. 36-M
Elevation: 381.8

Started 12-8-52
Finished 12-29-52
Water: 70 - 75 Light
490 - 495 Strong
Stands 210 feet

Location: 523' north & 830' east of the S. W. Corner N. W. ¼ Sec. 24 or 55' south and 52' east of No. 32-M

Drilled by: B.W. Bales
Examined by: E. A. Brecke
Casing: 35½' 8" Pipe

0	-	35	Surface
35	-	55	Gray shale, lime streaks
55	-	65	" "
65	-	90	" " , gray sand streaks
90	-	100	Gray sand, shaly
100	-	115	Gray sand, shale streaks
115	-	120	Brown shaly lime
120	-	130	Light gray crinoidal lime
130	-	185	Gray and brown lime, shale streaks
185	-	225	Dark gray sand, shale streaks
225	-	250	" " "
250	-	320	Gray and brown lime, shale streaks
320	-	335	Brown sand, shale streaks, (maroon?)
335	-	410	Gray shale, lime streaks
410	-	435	Black shale
435	-	470	Gray sand, con. caved shale
470	-	490	Gray shelly sand
490	-	530	White sand
530	-	560	Gray shelly sand

C O P Y

OZARK-MAHONING COMPANY

560 - 610	White sand	
610 - 615	White sand, little gray lime. Base of Bethel 612	
615 - 635	Gray lime	
635 - 640	" " , little green selvage	
640 - 660	Shale and selvage, lime streaks	
660 - 680	Dark brown shaly lime	
680 - 690	Lower O'Hara Lime	
690 - 712	Rosiclare sand	
712 - 740	Light gray oolitic lime	
740 - 755	Light brown lime, little selvage	
755 - 775	Dark brown lime	
775 - 785	Gray oolitic lime	

C O P Y

OZARK-MAHONING COMPANY

C. N. Hill Tract
Drill Hole No. 37-M
Elevation: 430.5

Started 12-10-52
Finished 1-7-53

Location: 712' north and 694' east of the S.W. corner of the N.E. $\frac{1}{4}$ of S.E. $\frac{1}{4}$ of Sec. 23 or 9' south and 290' east of 5-M

Water:
135 - 145 Light
Lost @ 165
680 - 685 Strong
Stands at 660'

Drilled by: Moreland and Hohler
Examined by: E. A. Brecke
Casing: 20 feet

0 - 19	Surface	
19 - 30	Gray sand, shaly partings, some red mud	
30 - 55	" " " "	
55 - 65	Gray sand	
65 - 90	Gray shale, sand streaks	
90 - 135	Gray and brown lime, shale streaks. Glen Dean.	
135 - 200	Gray sand	
200 - 230	Gray shale, few sand streaks	
230 - 235	White sand, shale streaks	
235 - 300	Gray and brown lime, shaly	
300 - 305	Gray and maroon shale	
305 - 380	Gray shale, lime streaks	
380 - 405	Black shale, little pyrite at base	
405 - 470	White sand, con. caved shale	
470 - 540	Gray shelly sand	
540 - 555	White shelly sand	
555 - 585	White sand	
585 - 590	White sand, some gray shaly sand	
590 - 595	" " , some gray lime. Base of Bethel 592	

595 - 615	Gray and brown lime
615 - 625	Gray lime and green selvage
625 - 645	Shale and selvage, lime streaks
645 - 650	Dark brown lime, shaly
650 - 665	Brown lime
665 - 670	Lower O'Hara lime
670 - 692	Rosiclare sand
692 - 700	Light gray oolitic lime
700 - 720	Gray and brown lime
720 - 735	Brown lime
735 - 759	Dark brown lime
759 - 765	Light gray lime

C O P Y

OZARK-MAHONING COMPANY

C. N. Hill Tract
Drill Hole No. 38-M
Elevation: 381.7
Location: 398' north and 482' east of the S.W. Corner of S.W $\frac{1}{4}$ of N.W. $\frac{1}{4}$ of Sec. 24, T 11 S, R 9 E or 94' south and 4' west of No. 12-M
Drilled by: Moreland and Hohler
Examined by: E. A. Brecke
Casing: 20'-3" $8\frac{1}{4}$" casing
50'- $6\frac{1}{4}$ casing

Started: 12-8-52
Finished: 1-31-53

Water: 31-35 Light
105 "
185 "
500 "
605 Fairly strong
665-675 " "
700 Strong
$782\frac{1}{2}$ "
815-820 Strong
Water lost @ 542
Stands 665-670 feet

0 -	30	Surface gravel and boulders
30 -	35	Brown lime boulders and mud
35 -	65	Black shale sand streaks
65 -	95	Gray sand, little shale
95 -	105	Gray sandy shale
105 -	115	Brown lime, shaly
115 -	125	Light gray coinoidal lime
125 -	155	Gray and brown lime, shale streaks
155 -	205	Gray sand
205 -	240	Gray shaly sand
240 -	320	Gray and brown lime shale streaks
320 -	335	Gray sand, shaly
335 -	415	Gray calcareous shale
415 -	435	Gray shale
435 -	448	Gray sand
448 -	465	Gray sand, shaly Mundis @ 465 - End of Contract Idm-E255
465 -	485	White sand
485 -	535	Gray shelly sand
535 -	540	Lost cuttings

540	- 547½	White quartzitic sand very rich acid spar
547½	- 555	White sand, some spar
555	- 565	White sand, crevices, some spar
565	- 570	Lost cuttings
570	- 595	Gray to white sand, little spar, few cuttings
595	- 600	Lost cuttings
600	- 605	White sand, little spar
605	- 610	Lost cuttings
610	- 620	Gray sand, little spar
620	- 625	Lost cuttings
625	- 645	Gray sand some gray quartzite and some spar, few cuttings.
645	- 647¼	Lost cuttings
647½	- 667½	White sand and quartzite, little acid spar, few cuttings
667½	- 675	Gray sand, some spar and Zn, trace Pb, few cuttings
675	- 682½	Gray sand, spar shines
682½	- 685	White sand " " , little Zn, trace Pb
685	- 687½	No cuttings
687½	- 692½	Gray shaly and quartzitic sand, traces spar, Zn and Pb
692½	- 695	Dark brown quartzitic sand, spar, Zn and Pb shines
695	- 700	" " " " , little leached buff lime & gray muddy gouge, little low grade spar and Zn
700	- 725	Con. brown quartzitic sand, some leached buff lime. little spar & Zn
725	- 755	Shale and selvage, some shaly lime and caved sand, trace of low grade spar, few Zn shines
755	- 765	Shale and selvage, some shaly lime, spar shines, trace barite
765	- 775	Shale and selvage, white oolitic lime, spar shines
775	- 780	Shale and selvage, some lime and sand, probably Rosiclare, spar shines
780	- 782½	No cuttings

782½ - 795	Sale and selvage, some lime and sand, probably Rosiclare spar shines.
795 - 810	Light colored lime, some selvage, Con. acid spar
810 - 815	Gray lime, tighter formation, trace selvage, trace spar
815 - 822	No cuttings, Ground drilled solid but soft
822 - 833	Gray lime, trace of selvage, spar shines

Note: This hole either cut a large slump zone or a fault zone as shown by the wide spread mineralization and displacement of formations. The assay results may not be representative and are difficult to correlate with ore faces in adjacent holes.

Ore face from 540-675 ft. averages 29.00 CaF_2

" " " 695-725 ft. averages 22.40 CaF_2
2.17 Zn

" " " 795-810 ft. averages 52.42 CaF_2

Hill - No. 38

Assays	$CaCO_3$	CaF_2
540 - 542½	11.40	56.86
542½ - 545	13.62	55.42
545 - 547½	3.28	86.22
547½ - 550	2.92	25.48
550 - 552½	2.72	35.70
552½ - 555	1.99	39.01
555 - 557½	2.55	19.29
557½ - 560	2.92	25.77
560 - 565	3.28	25.77
565 - 570	No cuttings	
570 - 575	2.55	34.98
575 - 580	1.24	27.31
580 - 585	2.33	20.20

Assays	$CaCO_3$	CaF_2	Zn	Pb
585 - 590	1.24	4.55		
590 - 595	0.69	15.79		
595 - 600	No cuttings			
600 - 605	1.79	21.34		
605 - 610	No cuttings			
610 - 615	1.79	35.57		
615 - 620	2.70	40.15		
620 - 625	No cuttings			
625 - 630	3.06	29.48		
630 - 632½	1.06	31.89		
632½ - 635	1.60	36.16		
635 - 637½	1.42	26.06		
637½ - 640	1.24	23.22		
640 - 642½	1.25	41.92		
642½ - 645	1.44	26.37		
645 - 647½	No cuttings			
647½ - 650	3.25	34.03		
650 - 652½	2.33	29.05		
652½ - 655	1.79	26.35		
655 - 657½	1.97	23.79		
657½ - 660	1.42	26.49		
660 - 665	1.42	28.62		
665 - 667½	1.60	22.79		
667½ - 670	2.73	17.27	3.04	0.21
670 - 675	3.47	14.83	2.21	0.22
675 - 677½	14.92	6.71		

Assays	$CaCO_3$	CaF_2	Zn
677½ - 680	3.98	6.29	
680 - 682½	9.26	6.43	
682½ - 685	4.89	4.87	2.00
685 - 687½	No cuttings		
687½ - 690	" "		
690 - 692½	" "		
692½ - 695	2.33	2.02	
695 - 697½) 697½ - 700)	13.46	18.81	
700 - 702½	7.99	24.64	2.00
702½ - 705	10.36	25.49	1.89
705 - 707½	20.75	18.66	2.71
707½ - 710	10.18	31.75	2.71
710 - 712½	18.20	22.08	3.63
712½ - 715	21.85	23.64	3.73
715 - 717½	10.91	39.15	2.51
717½ - 720	21.12	19.94	2.92
720 - 725	12.18	13.12	2.00
725 - 795	Not assayed		
795 - 800	7.26	41.28	
800 - 805	9.45	54.09	
805 - 810	7.08	61.91	

LEGEND

"O" AREA DRILLED UNDER ORIGINAL CONTRACT.

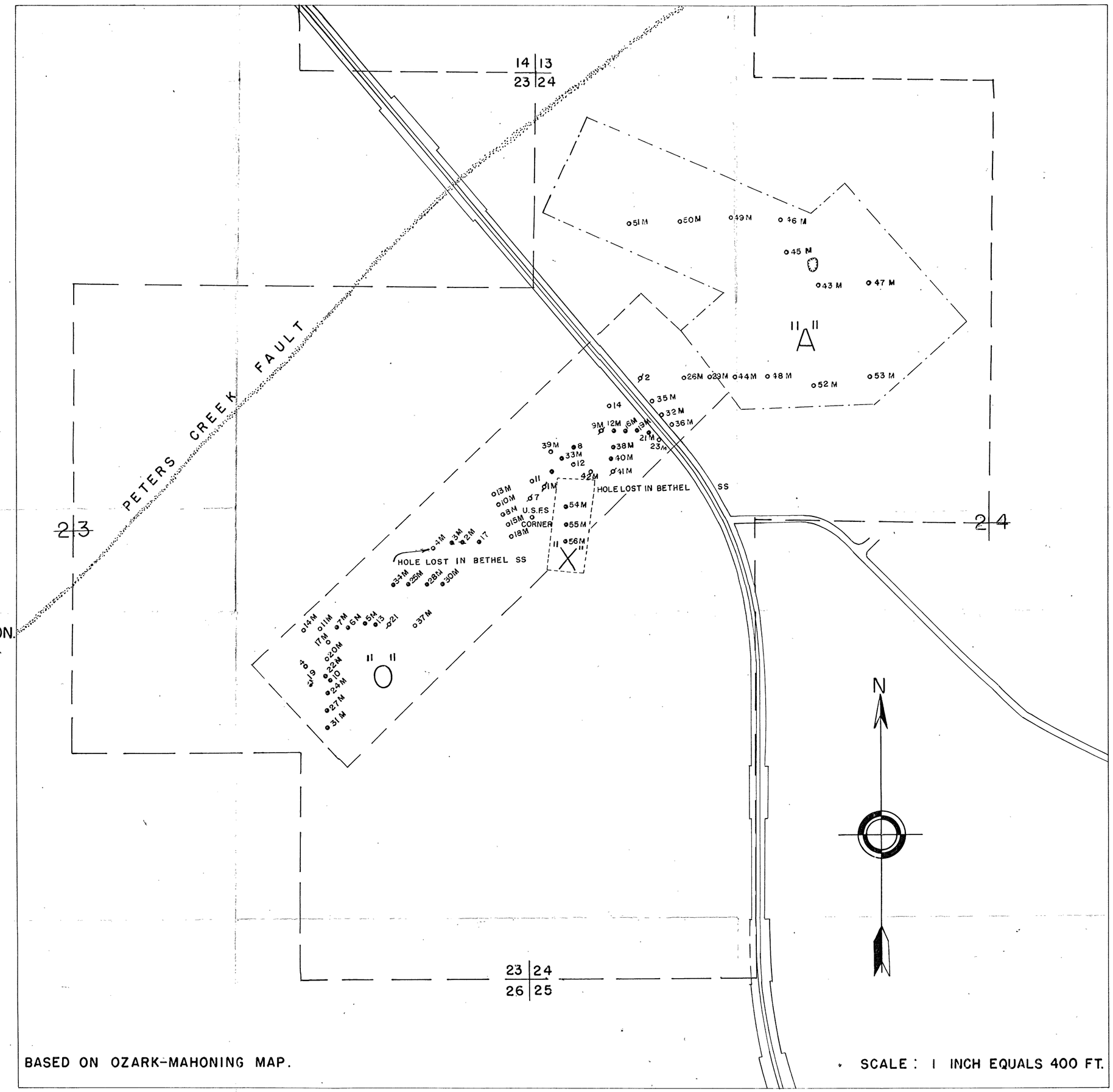
"A" AREA DRILLED UNDER AMENDMENT TO CONTRACT.

"X" AREA DRILLED ON COMPANY ACCOUNT AFTER CONTRACT CLOSED.

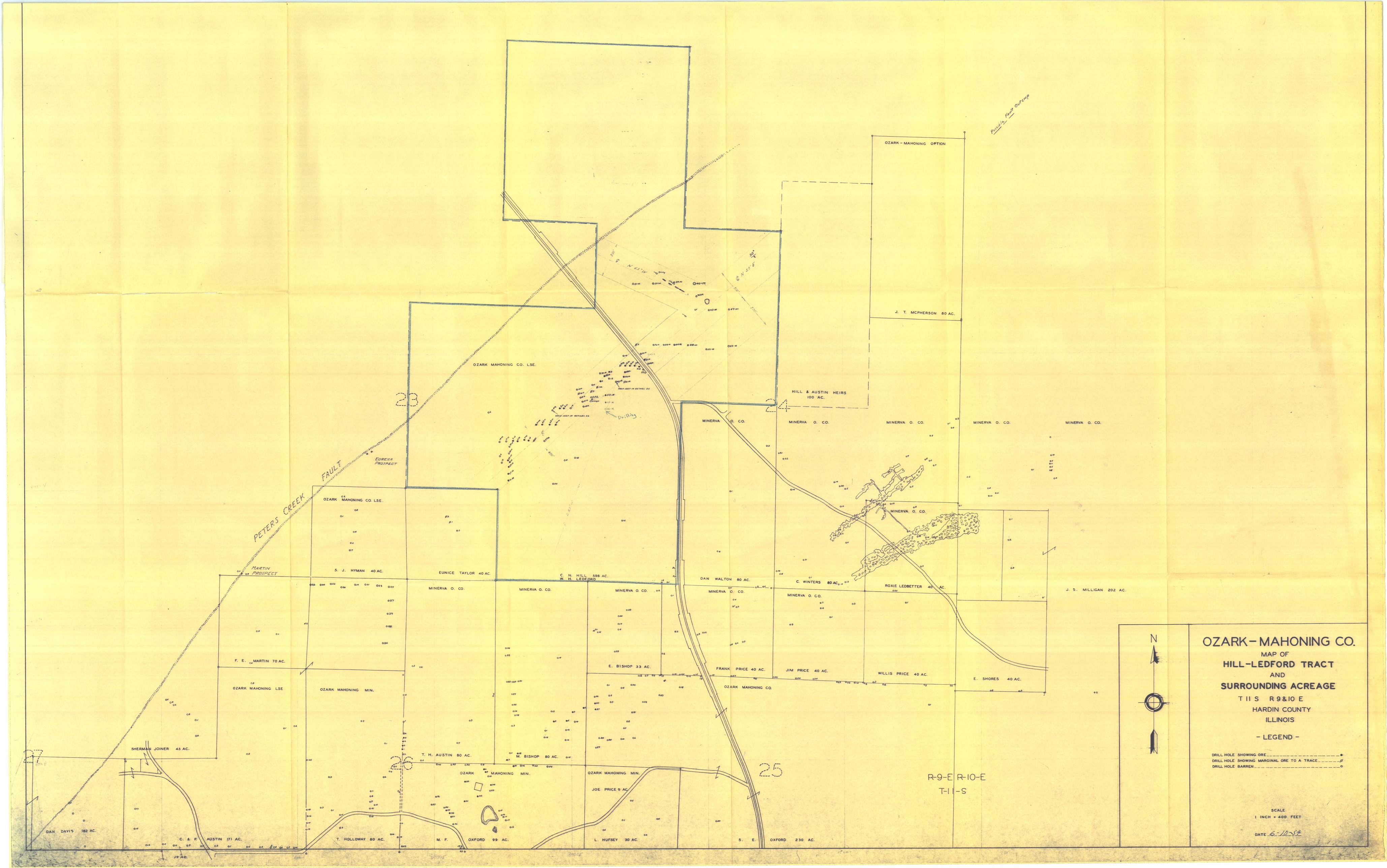
o BARREN HOLES.

● ORE HOLES.

MINOR MINERALIZATION.



PLAT OF HILL-LEDFORD TRACT, HARDIN COUNTY, ILLINOIS, SHOWING CHURN DRILLING DONE UNDER CONTRACT NO. IdmE-255 AND AMENDMENT, DOCKET NO. D.M.E.A. 2248.


OZARK - MAHONING OPTION
J. T. MCPHERSON 80 AC.
OZARK MAHONING CO. LSE.
HILL & AUSTIN HEIRS
100 AC.
MINERVA O. CO.
23
24
25
26
27
PETERS CREEK FAULT
EUREKA PROSPECT
MARTIN PROSPECT
S. J. HYMAN 40 AC.
EUNICE TAYLOR 40 AC.
C. N. HILL 598 AC.
W. H. LEDFORD
DAN WALTON 80 AC.
C. WINTERS 80 AC.
ROXIE LEDBETTER 40 AC.
J. S. MILLIGAN 202 AC.
F. E. MARTIN 70 AC.
E. BISHOP 33 AC.
FRANK PRICE 40 AC.
JIM PRICE 40 AC.
WILLIS PRICE 40 AC.
E. SHORES 40 AC.
OZARK MAHONING LSE
OZARK MAHONING MIN.
OZARK MAHONING CO.
SHERMAN JOINER 43 AC.
T. H. AUSTIN 80 AC.
M. BISHOP 80 AC.
JOE PRICE 9 AC.
DAN DAVIS 162 AC.
C. & P. AUSTIN 171 AC.
T. HOLLOWAY 80 AC.
M. F. OXFORD 99 AC.
L. HUFSEY 30 AC.
S. E. OXFORD 230 AC.
R-9-E R-10-E
T-11-S
N
OZARK-MAHONING CO.
MAP OF
HILL-LEDFORD TRACT
AND
SURROUNDING ACREAGE
T 11 S R 9&10 E
HARDIN COUNTY
ILLINOIS
- LEGEND -
DRILL HOLE SHOWING ORE
DRILL HOLE SHOWING MARGINAL ORE TO A TRACE
DRILL HOLE BARREN
SCALE
1 INCH = 400 FEET
DATE 6-10-54