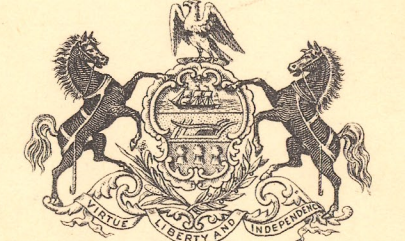


PRELIMINARY REPORT
LEIDY GAS FIELD AND ADJACENT AREAS

CLINTON COUNTY
PENNSYLVANIA

By
J. R. ENRIGHT AND A. I. INGRAM



COMMONWEALTH OF PENNSYLVANIA
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SYNOPSIS

The major natural gas discovery in Pennsylvania in 1950 was the opening of the Leidy gas field, Leidy Township, Clinton County, Pennsylvania. The discovery well, Leidy Prospecting Company, Series Clinton No. 1, was completed on January 9, 1950.

The significance of the Leidy field development lies in its geological location—it has extended Ordovician gas production further westward than it has been found previously in Pennsylvania and has opened a new trend along which additional Ordovician fields may be discovered. Prior to 1949, all commercial Ordovician gas production in north-central Pennsylvania was obtained on the Indiantown, Harrison, Indiana, and Newburg anticlines. The development of the East Fork-Burnettsville field on the Harrisburg anticline in 1947 greatly extended the Ordovician producing province to the southwest; the Leidy field, on the Walpole anticline, is another southward extension to the Ordovician province.

REMARKS ON DEVELOPMENT

Prior to the discovery of Ordovician gas at Leidy, a shallow (Upper Devonian) gas field had been developed along Little Creek. As early as 1944, some gas was obtained and by 1952, 10 million cubic feet had been drilled in the field (Johnson, 1952, p. 5). None of these wells are now commercially productive, but several of the Ordovician wells have obtained considerable quantities of gas from the shallow sandstone (see notes).

The Walpole sand discovery well in the Leidy field, Series Clinton No. 1, came in on January 9, 1950 producing an estimated 15,000,000 cubic feet of gas per day and had a reservoir pressure of 1400 pounds. Gas is obtained at a depth of 5800 feet in the upper part of the Ordovician sand.

Development of the field has been fairly rapid and by the end of December 1959, 12 producing wells and 3 dry holes had been completed. In addition to these wells, 10 other wells are drilling or are in the close and adjacent areas. To date the producing area of the field is approximately 3 1/2 mile long and 2 1/2 mile wide.

The Ordovician sand in the various wells is encountered at depths ranging from 5800 to 6300 and within the surface.

The initial open flow volume of the producing wells completed thus far have varied from 250,000 cubic feet to about 50,000,000 cubic feet of gas per day; initial reservoir pressures have ranged from 3000 to 1400 pounds.

Three gas lines—a 6-inch, an 8-inch, and a 4-inch—are taking gas out of the field.

GEOLOGIC INVESTIGATIONS

Following discovery of gas in the Ordovician sand in 1950, S. S. Calhoun of the Pennsylvania Geological Survey made a reconnaissance structural investigation (Calhoun, 1950) of the Allegheny Plateau between Adams County on the west and the Delaware River on the east. The structure of this area was determined by the strike and dip method and several surface maps were made to define the structural features on the anticline.

Calhoun's study showed the structural grade of the area and in various places it was a refinement and/or addition to the geologic structure as indicated by Pennsylvania's Bureau of Geology of the latter part of the 1920's.

The Harrisburg anticline, on which the East Fork-Burnettsville field is located, was selected for a detailed geologic study in 1944 and the results of this investigation have been published (Bergth et al., 1948). A similar project was begun in the Leidy gas field area on the Walpole anticline in the summer of 1959. The accompanying map and text are a preliminary report on this study, a more extensive report, now being prepared, will be issued in the near future.

METHOD OF INVESTIGATION

The field work in connection with this study was done by J. R. Enright assisted by Harry F. Stone. The project was under the direction of A. I. Ingram.

The geology of the Walpole anticline in the area addressed by this study was determined by strike and dip measurements, aerial distribution of various topographic maps, and the tracing of key beds.

In the East Fork-Burnettsville report (Bergth et al., 1948), strike and dip data have been evaluated according to reliability and designated on the map as first, second, or third class. Criteria used in classifying these measurements include the size of the outcrop, regularity of bedding, occurrence of dips within local areas, and character of sedimentation. The authors have found this system of classification extremely helpful in evaluating the relative weight to be placed on measurements, particularly in those areas of structural complexity where, it will enable the reader to judge the evidence on which the structural interpretation is based.

The top horizons whose elevations were determined at various places on the anticline and adjacent exposures have been most useful in determining the structure. These horizons are (1) the top of the Gettysburg red beds, and (2) the base of a Pennsylvanian conglomerate. The top of the red beds has been placed at the top of the more or less continuous red Upper Devonian section; the overlying (lower) Pennsylvanian conglomerate, and both these contain some red beds but the part-dolomitic sediments in the area are predominantly gray.

The base of the Pennsylvanian conglomerate, another horizon of the accompanying map, was usually found with little difficulty. Unfortunately it is characteristically covered by conglomerate, and often forms a prominent escarpment with accompanying small to very large boulders. This conglomerate frequently stands out in sharp relief on aerial photos; stereoscopic study of these photos, together with some ground control and the excellent topographic maps available in the area have enabled the authors to pick the data with a considerable degree of accuracy. A more detailed discussion of these studies will be included in the final report.

Elevations of ground control points have been determined with the altimeter.

REMARKS ON MAP

The base for the accompanying structural map was obtained from 7-1/2 minute quadrangle topographic maps issued by the U. S. Geological Survey. The original topographic scale of 1 inch equals 2000 feet is maintained.

The surface structure contours are drawn on the basis of a complete survey map but in the Pennsylvanian area are level designated, for example, 1200, on this map but were changed in the field by visiting

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Where the suffix "N" is used with the lower elevations, it indicates an elevation on the base of the Gettysburg. In this case the upper number is the elevation of the base of the Pennsylvanian conglomerate, estimated from the base of the Gettysburg.

The map designation of the Ordovician sand wells is denoted by the initials of the property owner and the number of the well on the map. For example, 5800 is the index number for the No. 1 well on the Leidy-Graham tract. For wells on land owned by the Commonwealth of Pennsylvania the designation is, for example, 5800-1; here the first number is the well number and the second is the tract or warrant, whichever the case may be. Elevations below sea level on the top of the Ordovician sand are shown with such simplified well symbols, for example, -500.

Locations of the shallow sand (Upper Devonian) gas wells are taken from Pennsylvania Geological Survey Progress Report 17, and the authors correspond directly with those used in this report.

A small portion of the East Fork-Burnettsville gas field is also shown in the northeastern part of the Allegheny Plateau. However, prospects are known to extend west and southeast of the Walpole anticline; the heavy amount of correlation with the characteristics of the recent Ordovician discoveries will, no doubt, encourage the testing of many of these prospects.

SYNOPSIS

The strata exposed at the surface in this area include in descending order, the Allegheny group and the Potomac series of the Pennsylvanian system. The lower Shaw anticline and the Pennsylvanian of the Allegheny group and the Onondaga formation, Gettysburg red beds and the Chemung facies of the Upper Devonian series.

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WELL RECORD SHEET FOR FIELD AND ADJACENT AREAS (Listing in alphabetical by town name)														
Map No.	Company	Tract and Well No.	Township	Quadrangle	Location	Elevation	Dip	Overcasts	Ordinary	Total Depth	Completed	100' / Page 100 Cu. Ft.	Initials Name of Driller	Other Notes
58-1	Allegheny Valley Oil & Gas Co.	W. 1/2 Sec. 1	Leidy	Harrisburg	58-1-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-2	Leidy Pros. Co.	W. 1/2 Sec. 2	Leidy	Harrisburg	58-2-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-3	Leidy Pros. Co.	W. 1/2 Sec. 3	Leidy	Harrisburg	58-3-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-4	Leidy Pros. Co.	W. 1/2 Sec. 4	Leidy	Harrisburg	58-4-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-5	Allegheny Valley Oil & Gas Co.	W. 1/2 Sec. 5	Leidy	Harrisburg	58-5-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-6	G. L. Calhoun Inc.	W. 1/2 Sec. 6	Leidy	Harrisburg	58-6-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-7	G. L. Calhoun Inc.	W. 1/2 Sec. 7	Leidy	Harrisburg	58-7-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-8	G. L. Calhoun Inc.	W. 1/2 Sec. 8	Leidy	Harrisburg	58-8-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-9	G. L. Calhoun Inc.	W. 1/2 Sec. 9	Leidy	Harrisburg	58-9-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-10	G. L. Calhoun Inc.	W. 1/2 Sec. 10	Leidy	Harrisburg	58-10-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-11	G. L. Calhoun Inc.	W. 1/2 Sec. 11	Leidy	Harrisburg	58-11-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-12	G. L. Calhoun Inc.	W. 1/2 Sec. 12	Leidy	Harrisburg	58-12-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-13	G. L. Calhoun Inc.	W. 1/2 Sec. 13	Leidy	Harrisburg	58-13-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-14	G. L. Calhoun Inc.	W. 1/2 Sec. 14	Leidy	Harrisburg	58-14-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-15	G. L. Calhoun Inc.	W. 1/2 Sec. 15	Leidy	Harrisburg	58-15-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-16	G. L. Calhoun Inc.	W. 1/2 Sec. 16	Leidy	Harrisburg	58-16-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-17	G. L. Calhoun Inc.	W. 1/2 Sec. 17	Leidy	Harrisburg	58-17-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-18	G. L. Calhoun Inc.	W. 1/2 Sec. 18	Leidy	Harrisburg	58-18-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-19	G. L. Calhoun Inc.	W. 1/2 Sec. 19	Leidy	Harrisburg	58-19-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-20	G. L. Calhoun Inc.	W. 1/2 Sec. 20	Leidy	Harrisburg	58-20-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-21	G. L. Calhoun Inc.	W. 1/2 Sec. 21	Leidy	Harrisburg	58-21-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-22	G. L. Calhoun Inc.	W. 1/2 Sec. 22	Leidy	Harrisburg	58-22-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-23	G. L. Calhoun Inc.	W. 1/2 Sec. 23	Leidy	Harrisburg	58-23-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-24	G. L. Calhoun Inc.	W. 1/2 Sec. 24	Leidy	Harrisburg	58-24-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-25	G. L. Calhoun Inc.	W. 1/2 Sec. 25	Leidy	Harrisburg	58-25-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-26	G. L. Calhoun Inc.	W. 1/2 Sec. 26	Leidy	Harrisburg	58-26-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-27	G. L. Calhoun Inc.	W. 1/2 Sec. 27	Leidy	Harrisburg	58-27-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-28	G. L. Calhoun Inc.	W. 1/2 Sec. 28	Leidy	Harrisburg	58-28-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-29	G. L. Calhoun Inc.	W. 1/2 Sec. 29	Leidy	Harrisburg	58-29-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-30	G. L. Calhoun Inc.	W. 1/2 Sec. 30	Leidy	Harrisburg	58-30-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-31	G. L. Calhoun Inc.	W. 1/2 Sec. 31	Leidy	Harrisburg	58-31-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-32	G. L. Calhoun Inc.	W. 1/2 Sec. 32	Leidy	Harrisburg	58-32-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-33	G. L. Calhoun Inc.	W. 1/2 Sec. 33	Leidy	Harrisburg	58-33-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-34	G. L. Calhoun Inc.	W. 1/2 Sec. 34	Leidy	Harrisburg	58-34-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-35	G. L. Calhoun Inc.	W. 1/2 Sec. 35	Leidy	Harrisburg	58-35-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-36	G. L. Calhoun Inc.	W. 1/2 Sec. 36	Leidy	Harrisburg	58-36-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-37	G. L. Calhoun Inc.	W. 1/2 Sec. 37	Leidy	Harrisburg	58-37-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-38	G. L. Calhoun Inc.	W. 1/2 Sec. 38	Leidy	Harrisburg	58-38-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-39	G. L. Calhoun Inc.	W. 1/2 Sec. 39	Leidy	Harrisburg	58-39-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-40	G. L. Calhoun Inc.	W. 1/2 Sec. 40	Leidy	Harrisburg	58-40-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-41	G. L. Calhoun Inc.	W. 1/2 Sec. 41	Leidy	Harrisburg	58-41-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-42	G. L. Calhoun Inc.	W. 1/2 Sec. 42	Leidy	Harrisburg	58-42-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-43	G. L. Calhoun Inc.	W. 1/2 Sec. 43	Leidy	Harrisburg	58-43-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-44	G. L. Calhoun Inc.	W. 1/2 Sec. 44	Leidy	Harrisburg	58-44-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-45	G. L. Calhoun Inc.	W. 1/2 Sec. 45	Leidy	Harrisburg	58-45-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-46	G. L. Calhoun Inc.	W. 1/2 Sec. 46	Leidy	Harrisburg	58-46-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-47	G. L. Calhoun Inc.	W. 1/2 Sec. 47	Leidy	Harrisburg	58-47-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-48	G. L. Calhoun Inc.	W. 1/2 Sec. 48	Leidy	Harrisburg	58-48-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-49	G. L. Calhoun Inc.	W. 1/2 Sec. 49	Leidy	Harrisburg	58-49-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-50	G. L. Calhoun Inc.	W. 1/2 Sec. 50	Leidy	Harrisburg	58-50-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-51	G. L. Calhoun Inc.	W. 1/2 Sec. 51	Leidy	Harrisburg	58-51-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-52	G. L. Calhoun Inc.	W. 1/2 Sec. 52	Leidy	Harrisburg	58-52-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-53	G. L. Calhoun Inc.	W. 1/2 Sec. 53	Leidy	Harrisburg	58-53-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-54	G. L. Calhoun Inc.	W. 1/2 Sec. 54	Leidy	Harrisburg	58-54-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-55	G. L. Calhoun Inc.	W. 1/2 Sec. 55	Leidy	Harrisburg	58-55-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-56	G. L. Calhoun Inc.	W. 1/2 Sec. 56	Leidy	Harrisburg	58-56-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-57	G. L. Calhoun Inc.	W. 1/2 Sec. 57	Leidy	Harrisburg	58-57-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-58	G. L. Calhoun Inc.	W. 1/2 Sec. 58	Leidy	Harrisburg	58-58-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-59	G. L. Calhoun Inc.	W. 1/2 Sec. 59	Leidy	Harrisburg	58-59-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-60	G. L. Calhoun Inc.	W. 1/2 Sec. 60	Leidy	Harrisburg	58-60-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-61	G. L. Calhoun Inc.	W. 1/2 Sec. 61	Leidy	Harrisburg	58-61-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-62	G. L. Calhoun Inc.	W. 1/2 Sec. 62	Leidy	Harrisburg	58-62-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-63	G. L. Calhoun Inc.	W. 1/2 Sec. 63	Leidy	Harrisburg	58-63-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-64	G. L. Calhoun Inc.	W. 1/2 Sec. 64	Leidy	Harrisburg	58-64-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-65	G. L. Calhoun Inc.	W. 1/2 Sec. 65	Leidy	Harrisburg	58-65-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-66	G. L. Calhoun Inc.	W. 1/2 Sec. 66	Leidy	Harrisburg	58-66-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-67	G. L. Calhoun Inc.	W. 1/2 Sec. 67	Leidy	Harrisburg	58-67-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-68	G. L. Calhoun Inc.	W. 1/2 Sec. 68	Leidy	Harrisburg	58-68-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-69	G. L. Calhoun Inc.	W. 1/2 Sec. 69	Leidy	Harrisburg	58-69-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-70	G. L. Calhoun Inc.	W. 1/2 Sec. 70	Leidy	Harrisburg	58-70-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-71	G. L. Calhoun Inc.	W. 1/2 Sec. 71	Leidy	Harrisburg	58-71-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-72	G. L. Calhoun Inc.	W. 1/2 Sec. 72	Leidy	Harrisburg	58-72-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-73	G. L. Calhoun Inc.	W. 1/2 Sec. 73	Leidy	Harrisburg	58-73-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-74	G. L. Calhoun Inc.	W. 1/2 Sec. 74	Leidy	Harrisburg	58-74-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-75	G. L. Calhoun Inc.	W. 1/2 Sec. 75	Leidy	Harrisburg	58-75-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-76	G. L. Calhoun Inc.	W. 1/2 Sec. 76	Leidy	Harrisburg	58-76-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-77	G. L. Calhoun Inc.	W. 1/2 Sec. 77	Leidy	Harrisburg	58-77-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-78	G. L. Calhoun Inc.	W. 1/2 Sec. 78	Leidy	Harrisburg	58-78-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-79	G. L. Calhoun Inc.	W. 1/2 Sec. 79	Leidy	Harrisburg	58-79-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-80	G. L. Calhoun Inc.	W. 1/2 Sec. 80	Leidy	Harrisburg	58-80-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-81	G. L. Calhoun Inc.	W. 1/2 Sec. 81	Leidy	Harrisburg	58-81-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-82	G. L. Calhoun Inc.	W. 1/2 Sec. 82	Leidy	Harrisburg	58-82-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-83	G. L. Calhoun Inc.	W. 1/2 Sec. 83	Leidy	Harrisburg	58-83-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-84	G. L. Calhoun Inc.	W. 1/2 Sec. 84	Leidy	Harrisburg	58-84-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58-85	G. L. Calhoun Inc.	W. 1/2 Sec. 85	Leidy	Harrisburg	58-85-1	5800	10° E	5800	5800	5800	5800	1000	1000	
58														